RBOC Financial Consulting Team

Review of Sunset Reservoir – North Basin Project

Final Report to the Public Utilities Revenue Bond Oversight Committee

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I. Executive Summary

Purpose of 2009 Review

The purpose of the 2009 RBOC Review is to use the Sunset Reservoir-North Basin project as a test case to determine whether the San Francisco Public Utilities Commission (PUC) has developed the capital project reporting capabilities required to permit the RBOC and other interested parties to evaluate whether WSIP projects are meeting budget, schedule and other performance objectives. The 2009 Review is also intended to determine whether budget and schedule changes to the Sunset Reservoir project have been made in accordance with PUC and Controller's Office policies and procedures, and whether the WSIP's current policies and procedures reflect leading industry practices for administering large infrastructure programs.

Specific Tasks in 2009 Review

The RBOC identified three tasks for the consulting team to undertake in the 2009 Review:

Task 1: Review the most current Quarterly Project Status Report provided by the San Francisco Public Utilities Commission for Project CUW35801 – Sunset Reservoir-North Basin. Evaluate the schedule and describe in detail changes between activities planned, approved and delivered.

Task 2: Review all budget elements noting any changes to amounts estimated, approved and spent. Examine the propriety of each change measured against current PUC policies and procedures associated with project management, construction controls, change order authority and any other pertinent policy established by the Commission. Provide an assessment as to whether such changes are allowable, allocable, and reasonable when reviewed against the expenditure of bond proceeds in accordance with existing law.

Task 3: With respect to completed Tasks 1 & 2, review how the Commission policies complement those set forth under the Office of the City Controller. Consultant to review and assess how the Commission's internal practices complement those set forth by the Office of the City Controller or require modification in order to become compliant. Consultant to review and evaluate PUC practices against standard industry practices associated with public infrastructure projects of a similar scope.

<u>RBOC Report Review Process</u>

A draft of this report was discussed with the RBOC at the Committee's meeting on October 19, 2009. A Draft Final version of the report was discussed with the RBOC at the Committee's meeting on November 16, 2009. The Final version of the report reflects many constructive comments and questions provided by Committee members on both drafts. The drafts of the report also were reviewed by PUC staff, who provided helpful comments, clarifications and follow-up information throughout the process of developing the Final report.

Limitations of 2009 Review

Although the 2009 Review may identify specific findings or issues with regard to the Sunset Reservoir-North Basin project, is the report focuses on only a single project, which is of a modest scope and cost compared to other WSIP projects. Therefore, the RBOC should use caution in extrapolating these findings to other WSIP projects, or to the WSIP as a whole. However, the Review may assist the RBOC in identifying issues or questions that it would like to pursue regarding the management of the WSIP, or other specific WSIP projects, in the future.

Summary of Findings, Risks and Recommendations

The consulting team's overall conclusions are summarized below. A detailed listing of all findings, risks and recommendations is provided at the end of the Executive Summary.

- The PUC provided adequate explanations of all schedule changes associated with the Sunset Reservoir – North Basin project, and in general, the approved schedule changes conform to PUC's policies and procedures.

- PUC's construction management and project management policies and procedures are consistent with industry leading practice for large infrastructure programs.

- PUC demonstrated the capability to provide explanations of what changes occurred in the Sunset Reservoir project's budget from 2005 through 2009 at the phase level, but in certain instances, those explanations did not adequately address the reason(s) why such changes occurred. We have offered comments on each of PUC's explanations, and recommendations for how PUC could improve its responses to similar questions in any future project audits.

- Based on our review of the Quarterly Project Status Report for the Sunset Reservoir project, PUC management and PUC's stakeholders, such as the RBOC, could benefit from reporting on "Key Performance Indicators" (KPI), which provide an executive level tool to monitor project performance. The KPIs envisioned for WSIP projects would use data from existing systems, but are structured in a summarized level to provide project and program level information in a succinct manner. KPIs also can be structured to measure project and program level risk, depending on the design objectives. More importantly, they provide a common platform to capture and measure data that can be measured over time (e.g. benchmarks).

- The vouching of the Sunset Reservoir project's invoices identified no issues. The project's appropriations in FAMIS were tracked back to their source information. The data in FAMIS and Primavera (P6) should be reconciled, so that both systems report data on project management costs that have been allocated to the project.

- We tested the allocated Overhead amounts for the Sunset Reservoir project, and four other WSIP projects. We compared each project's Overhead allocation against its construction budget to create a unit rate of allocated Overhead to see if the unit rate correlated across construction value. The test shows that allocated Overhead amounts do not necessarily correlate with budgeted construction values: the larger construction values do not result in a higher Overhead allocation.

Background on Sunset Reservoir – North Basin Project

Sunset Reservoir was originally constructed in 1938, and is located near 28th Avenue and Ortega Street. The Sunset Reservoir – North Basin Project was designed to implement the recommendations of 1996 Utilities Engineering Bureau Seismic Condition of Reservoir Roofs Report to seismically strengthen reservoirs roofs, columns and beams. The roof of the North Basin was identified as the highest priority of all the City Reservoirs for seismic retrofitting.

The Sunset Reservoir project was divided into two phases[1], along with security improvements:

- Phase A - Soil Embankment Stabilization (WD-2397). Phase A included the design and construction of slope stabilization at the embankment of the Reservoir North Basin.

- Phase B - Roof Seismic Retrofit, Reservoir Relining (WD-2406R). Phase B included the design and construction of structural improvements, such as concrete frames and footings, shear walls and a new concrete reservoir lining, and repairs to damaged roof slab along with civil, electrical, irrigation and landscaping improvements.

Summary of Report Findings, Risks and Recommendations

Each section of the 2009 Review addresses one of the tasks identified by the RBOC, and includes a discussion of our team's findings, any risks associated with those findings, and any recommendations concerning ways that PUC could improve its project reporting and its procedures[2]. The Report's findings, risks and recommendations are presented below.

[1] The term "phase" will be used in two different contexts in this Report:

- Phases A and B of the Sunset Reservoir project, which are identified above; and
- Project phases, which reflect the "work breakdown structure" for each WSIP project. The current project phases for WSIP projects are: Project Management, Planning, Environmental, Design, Bid and Award, Construction Management, Construction, and Close Out.

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[2] The roman numeral associated with each finding, risk and recommendation designates the section of the Report in which the item is discussed.

[3] Because of timing issues, an accurate audit of the expenditure reconciliation of Primavera (P6) to FAMIS as of June 30,

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Project Schedule

Finding III.1 - We found that PUC provided information that adequately itemized all Phase A and Phase B schedule changes, and identified the reasons why the changes occurred.

Risks III.1 Reasons for Schedule Changes

Not applicable.

Recommendations III.1 Reasons for Schedule Changes
Not applicable.

Finding III.2 – We found that current PUC policies and procedures were generally followed with the exception of timely notification of change orders/changes that have time implications.

PUC staff has stated that Sunset Reservoir – Phase A was constructed under "old" PUC construction policies and procedures. In contrast, current WSIP projects follow the "new" PUC procedures. The Sunset Reservoir - Phase B was constructed using "a hybrid of old and new procedures." We found that the appropriate change management protocols were followed at the time that each Phase A and Phase B change order was approved.

Risks III.2 - Whether Protocols Were Followed

Although schedule change procedures associated with Phase A were followed, there was a time lag in processing the contract modifications. The practice of not identifying changes in a timely manner has the effect of approving history rather gaining concurrence prior to the event. This practice places those in a position to approve the change with no options except to rubber stamp the request.

Recommendations III.2 - Whether Protocols Were Followed

We recommend that there be no more than a one month delay in reporting potential time impacts.

Finding III.3- We found that project schedule changes were documented as required by policies and procedures.

The changes to the Phase A schedule were included in the proposed change order (PCO) documentation and referenced on the contract modification. The changes to the Phase B schedule were adequately documented

Risks III.3 - Whether Project Schedule Changes Were Documented

Not applicable.

Recommendations III.3 - Whether Project Schedule Changes Were Documented

Not applicable.

Finding III.4 – We found that changes to the Phase A and Phase B schedule were adequately reported. We also found that there was some confusion in the reporting of the Phase A schedule regarding the definition of the term "completion," that is, whether the term was referencing final or substantial completion.

The change to the Phase A schedule was adequately reported in the WSIP Quarterly Project Status Reports. When the potential impact of the rain delay was recognized, it was reported in the March 2006 (4th Quarter FY 07/08) Quarterly Report Project Status. However, in the Quarterly Reports, there was some confusion regarding which completion date was being affected, the "Substantial Completion" date or the "Final Completion" date.

The Phase B schedule change associated with the rooftop crack repair and the impact of cold temperatures on the fiberglass reinforced polymers roof strengthening was adequately identified in the "Major Issues" section of the 1st Quarter FY2008/09 Quarterly Report

Risks III.4 - Whether Project Schedule Changes Were Reported

The WSIP program has a multitude of projects, with each project managed by an individual team. It is easy for the individual project teams to lose sight of the audience for the WSIP quarterly reports. Modifying the detail presented, or changing the milestones reported upon, without an explanation of why the change is occurring, can cause confusion for the stakeholders and members of the public who rely upon the Quarterly Report as a source of information on the status of specific WSIP projects.

Recommendations III.4 - Whether Project Schedule Changes Were Reported

Establish one consistent format for reporting the schedule on the quarterly reports and accompanying standard definitions.

Project Budget & Procedures

Explanations of Project Budget Changes

Finding IV.1: We found that PUC's explanation for phase level budget changes occurred could be improved to explain the reasons driving such changes.

Because PUC's WSIP Quarterly Reports are intended to serve as high-level, summary documents, the individual quarterly project status reports included in the Quarterly Report provide limited information about how and why budget changes have occurred at the phase level. As a result, PUC project staff developed responses to the consulting team's questions based on their review of the information stored in the Primavera (P6) program control system. Compared to our 2007 audit, PUC was able to provide significantly better information regarding project budget changes that have occurred since 2005 at the phase level. This indicates that PUC has implemented a capital project reporting system that can be used to provide feedback to stakeholders regarding how and why WSIP project budgets and schedules change over time.

However, in several of their responses, PUC focused on how certain budget elements within a phase changed, but did not answer the question of why the change occurred. In addition, in reviewing PUC's responses and the project status information provided to stakeholders through the WSIP Quarterly Reports, we concluded that:

A. Between 2005 and 2009, PUC did not have a consistent methodology for determining which types of project expenses should be included in each project phase, or a standard methodology for estimating contingency levels.

B. PUC's Quarterly Report project cost reporting does not provide information on the movement of costs between phases within a project.

C. PUC's Quarterly Report project cost reporting could be improved to track and report on contingency usage and history.

D. PUC could use Key Performance Indicators (KPI) to identify for stakeholders how a project is progressing, and whether the project faces budget and/or schedule pressure.

Risk IV.1- PUC's Explanation of Why Phase Level Budget Changes Occurred Could Be Improved

PUC risks harming its credibility with stakeholders if it is unable to provide complete explanations of why the budgets for WSIP projects change over time. PUC also risks harming its credibility if the project performance indicators that it presents to stakeholders do not clearly convey whether a project is facing budget, scope or schedule risk. Unless KPI are an established data set, there is also a risk of focusing staff on less important issues that may arise during the course of a project. Providing explanatory notes on budget changes provides a single repository that can be understood throughout the organization, and can provide for a more transparent process to manage fiscal aspects of the project.

Recommendation IV.1- PUC's Explanation of Why Phase Level Budget Changes Occurred Could Be Improved

We have provided comments on specific PUC's responses, which highlight the areas where PUC could improve its explanations of why budget changes at the phase-level were necessary from 2005 to 2007, or from 2007 to 2009. PUC can use these comments as guidance in developing more complete responses to future RBOC project audits, and project audits by other interested parties. In addition, we recommend that:

A. PUC should settle upon a project budget methodology and stick with it.

B. As a general matter, PUC's WSIP budget reporting should include the capability to track, at the phase level, each project's original 2005 baseline budget, changes to the budget that occur over time, and current budget, along with narrative concerning the reasons why each budget change was executed. Although this data may be tracked in Primavera and reported to team members in monthly reports, this information should be catalogued and provided in an

appendix to the WSIP program budget.

C. Although there are legitimate reasons why PUC may wish to limit access to information about project contingency usage, it is important for key stakeholders to have access to this data.

D. We recommend that PUC report on the following "Key Performance Indicators" that would provide stakeholders with a better sense of whether a project is facing budget or schedule pressure. Sample Key Performance Indicators include:

Figure 1. Proposed WSIP Project Key Performance Indicators

Key Performance Indicator	What It Measures
% Change Order Value/Original Contract Value	Variance from contracted (base) scope of work
# Activities On Critical Path/Total Number Of Activities	Ability to complete project on time/project criticality
% Of $ Expended/% Of Time Expended	Ability to place work within contracted time parameters (throughput)
% Of Contingency Used/% Of Time Used	Rate of contingency use given contracted time

Finding IV.2- We found that the WSIP Quarterly Report does not provide information on the source of project funding increases or phase budget increases

Based on our review of the WSIP Quarterly Reports, it is not possible to directly trace how savings from one project were applied to another project. Based on information from PUC staff, we learned that the increase in the project budget from 2005 to 2007 was funded from savings from the other San Francisco Regional project, the University Mound – North Reservoir.

Risk IV.2- Quarterly Report Does Not Identify Sources of Project Funding Increases or Phase Budget Increases

If all budget transfers between projects are not explicitly reported to stakeholders and the general public, the PUC may be perceived as attempting to hide information about its management of the WSIP program's finances. This could harm the agency's overall efforts to improve transparency and to demonstrate its accountability.

Recommendation IV.2- Quarterly Report Does Not Identify Sources of Project Funding Increases or Phase Budget Increases

While PUC has received certain flexibility from the Board of Supervisors to transfer appropriated funds from one project to another within regions, budget transfers should be catalogued and documented in PUC's primary report to stakeholders and the general public, the WSIP Quarterly Report. This becomes increasingly important with the transition from a single fund source to multiple

fund sources: comingling of fund sources with potentially different eligibilities poses a significant risk that could be exacerbated by not identifying sources and uses of budget transfers.

Finding IV.3 – Current program management system, (P6) is not configured to track program funding as it is designed to handle scheduling, cost reporting, and technical processes associated with design and construction.

P6 is designed to track standard engineering and construction processes, and for cost reporting, but it is not designed to track program funding. The WSIP currently relies almost exclusively on Proposition A bond funds as its funding source. However, in the future, if the WSIP obtains additional approvals for a new series of revenue bond issues, or receives funding from federal or state sources, each of which may have different conditions for their use, PUC may need the ability to use its program management system to track multiple funding sources. The alignment of funding and scope is a critical program management oversight function.

Risk IV.3 – Current program management system, (P6) is not configured to track program funding

Revenue bond programs, and federal and state grant funds, often have scope, expenditure and time limitations attached to the funds. Tracking only the cost, schedule and scope of a project can overlook specific limitations of each funding source that might affect the way project funds are spent.

Recommendation IV.3 – Program Funding Not Tracked Or Reported

We recommend that in the future, the WSIP Quarterly Report format should incorporate funding reports.

Did Sunset Reservoir Change Orders Comply with PUC Policies and Procedures?

Finding IV.4- We found that project changes complied with PUC Policies and Procedures

We reviewed the Contract Modifications that were executed for the Phase A and Phase B construction contracts, as well as PUC's Construction Management and Project Management policies and procedures. We found that the Change Control procedures and approval levels are reasonable for the management of a large capital program, and that in general, the Sunset Reservoir project complied with PUC's policies and procedures.

Risks IV.4- Project changes complied with PUC Policies and Procedures

Not applicable.

Recommendations IV.4- Project changes complied with PUC Policies and Procedures

Not applicable.

Finding IV.5 – We found that a change order for work that was potentially not warranted was negotiated and approved to avoid possible downstream issues with the contractor.

There were certain instances where the PUC's Construction Management staff did not believe that a proposed change order was warranted, but approved it "in the interests of partnering," or "in order to avoid a claim," even though these are not specifically identified as reasons for change orders in PUC's procedures.

Risks IV.5– Changes "In Interest of Partnering"

The risk associated with approving questionable changes in order to avoid claims is that knowledge of this practice may give contractors an incentive to pursue claims that should be denied, since the agency may be more inclined to approve borderline claims rather than contest them. This risk must be balanced against the risk associated with denying all questionable claims, and potentially incurring higher legal costs. This practice may also be viewed as setting a precedent to other contractors on other program projects with reason to submit such requests for change orders.

Recommendations IV.5– Changes "In Interest of Partnering"

PUC has recently adopted new procedures that include formal partnering (Construction Management procedure P 24) and dispute resolution (Construction Management procedure P 19) protocols. This approach provides a structured framework for discussing and evaluating questionable claims. As it implements these new procedures, PUC should ensure that it explicitly evaluates the costs and benefits associated with any claims avoidance actions, and documents its actions.

Finding IV.6 – We found that payments were adequately documented

In reviewing the contract payment and other invoices, we determined that all payments had the proper "encumbrance" documents in place to allow payment, and that the payments themselves were for the appropriate time period, for the proper amount, made to the correct vendor, charged to the correct project and for the appropriate goods and services.

Risks IV.6- Payments Are Properly Documented

Not applicable

Recommendations IV.6 - Payments Are Properly Documented

Not applicable.

Finding IV.7 – We found that PUC is streamlining invoice processing through the use of a computerized invoice processing system.

PUC is moving forward with the computerization of the invoicing process. Under the old manual system, approximately 25 pieces of paper supported each claim for payment. This has been reduced

by approximately two-thirds. This system should prove to be more efficient and effective in paying contractors in a more timely fashion.

Risk IV.7 – Streamlining Invoice Processing

Under the provisions of the City's Administrative Code, the PUC is prohibited from paying interest on late payments. Nonetheless, if PUC gains a reputation within the contracting community for untimely payments, this could result in somewhat higher cost proposals on future contracts, as contractors compensate for their higher anticipated financing costs.

Recommendation IV.7 - Streamlining Invoice Processing

We believe still more attention needs be given this area with an eye toward further streamlining the payment approval process. There are still a minimum of six approvals necessary before a payment voucher can be issued. This would benefit the WSIP program by facilitating the prompt payment of contractor invoices, as the volume of WSIP construction activity increases over time.

Finding IV.8- We were able to reconcile appropriation amounts in FAMIS to Board of Supervisor authorizations.

The appropriation amounts reflected in FAMIS as of June 30, 2009, were traced back to the authorizations of the Board of Supervisors with no issues. We accounted for the pre-CIP funding, a revenue transfer and an allocation of program management costs to balance to the total FAMIS appropriation. However, the schedule for allocating WSIP program management costs to individual projects should be formalized.

Risks IV.8- Appropriations

Program Management costs associated with WSIP projects are allocated costs, rather than direct expenses. Without a transparent allocation methodology and schedule for future allocations of these expenses, there may be a potential for cost allocations to be manipulated to keep certain projects from appearing to be over-budget by allocating less than the "appropriate" share of program management expenses to them.

Recommendation IV.8 – We found that on-going allocation of program management costs do not follow a standard procedure.

The allocation of program management costs to the projects requires increased standardization. Although PUC staff indicated that the allocation of these costs should occur on an annual basis, a firm schedule for the ongoing allocation of these costs to projects does not appear to be in place; an allocation occurred in June 2008, but no allocation occurred in June 2009. The protocol for determining when program management costs should be allocated, and to which projects, needs be more clearly defined.

Finding IV.9 – We found that the Primavera/FAMIS Reconciliation should be improved by standardizing the treatment of program management costs

As a result of the timing issues involved with using a June 30th cut-off date[3], we compared data from FAMIS and P6 as of the end of July 2009. The reconciliation provided below indicates that the difference between the two systems was less than one-tenth of one percent. A larger accounting issue is the handling of the project management allocation ($1,866,857) by Primavera. In FAMIS, both the budget and expense were moved into the Sunset Reservoir project. Primavera has chosen to filter out this transaction and leave the allocation in the master account.

Risk IV.9 – Primavera/FAMIS Reconciliation

Unless, this methodology is changed, these allocations will be reconciling items for the life of the project between the two systems. The two systems will never truly align. The projects total costs would never be displayed in Primavera.

Recommendations IV.9 - Primavera/FAMIS Reconciliation

- The methodology for the distribution of project management costs should be changed in Primavera to mirror the treatment of those costs in FAMIS, so that all costs allocated to each project are shown in that project in Primavera.

- Although the differences in the data found in P6 and FAMIS is relatively small, the PUC should emphasize taking corrective action of reconciling items. This issue was raised in the RBOC's 2007 Report. The longer that reconciling entries languish and accumulate, the harder it becomes to bring two systems back into balance.

Review of Policies & Procedures

Finding V.1 – Controller and PUC should streamline contractor payment processing

In December 2008, the Controller instituted a policy that delegated authority for certain accounting transactions to certain low-risk City Departments. Currently, this policy does not apply to the PUC, because PUC already funds a position on the Controller's staff that is dedicated to reviewing and processing PUC payment transactions. However, as the rate of spending on the WSIP increases, PUC staff believes that delegating low risk accounting transactions to PUC could help address pending concerns about the prompt processing of a larger number of payments in the future.

[3] Because of timing issues, an accurate audit of the expenditure reconciliation of Primavera (P6) to FAMIS as of June 30, 2009 was not possible. Because of the fiscal year-end closing, in FAMIS the month of June 2009 did not close until the end of August. Primavera used June 2009 data that was downloaded from FAMIS on July 13th. It was impossible to get a snap-shot of FAMIS as of July 13th to compare against because once a date has passed in FAMIS, and more expenditure data is loaded into the system, data regarding the status of FAMIS on earlier dates cannot be retrieved

Risks V.1 - Streamlining Contractor Payment Processing

If PUC gains a reputation within the contracting community for untimely payments, this could result in somewhat higher cost proposals on future contracts, as contractors compensate for their higher anticipated financing costs.

Recommendation V.1 - Streamlining Contractor Payment Processing

We recommend that the Controller delegate authority to the PUC for transaction review granted other low-risk departments. This would assist PUC Finance in managing their anticipated increased workload from WSIP transactions. That, in turn, would benefit the WSIP program by reducing the chances that the payment of complex invoices could be delayed by a lack of timely review at either the Controller's Office or PUC Finance.

Finding V.2 - We found that the accounting for bond proceeds requires ongoing management attention

The accounting for bond proceeds involves setting up and tracking four categories of records (Commission Program Adopted Budget, Board-approved Appropriation Budget, encumbrance and actual spending) across each series of bond proceeds. The PUC and Controller agree that this is a time-consuming process, but that the interest expense savings justify the effort. PUC has indicated that while FAMIS can meet the reporting needs for the bond program, it is not a flexible system, and that the process they must use is cumbersome, and can be challenging to implement properly.

Risk V.2 – Accounting for Bond Proceeds

The PUC is aware of the risks associated with improperly accounting for the use of tax-exempt bond proceeds.

Recommendation V.2 – Accounting for Bond Proceeds

We recommend that the PUC and Controller's Office continue to pursue ways that they can meet the reporting needs for the tracking of bond proceeds.

Finding V.3 - We found that PUC Construction Management and Project Management Procedures comply with Controller's policies and are consistent with leading industry practices

PUC procedures for Construction Engineering, Construction Management and Project Management have been reviewed. In general, the Commission's procedures are in compliance with the Office of the City Controller's policies. The CM procedures that are posted on the WSIP website have recently been updated and are largely consistent with industry leading practices.

Risks V.3 - PUC Construction Management and Project Management Procedures

Not applicable.

Recommendations V.3 - PUC Construction Management and Project Management Procedures

Although we found that PUC's procedures are consistent with leading industry practices, in the body of the report, we offer several observations and recommendations regarding specific procedures that may be considered for future revisions.

Possible Topic for Future Analysis

This report provides the RBOC with a template for a highly detailed review of a revenue bond-funded PUC construction project. However, this type of detailed review of every WSIP project would not be practical or cost-effective to undertake. Going forward, the consulting team recommends that the RBOC consider pursuing the following course for independently assessing how WSIP projects are performing, and identifying which projects should undergo further analysis:

- Establish Key Performance Indicators, based on leading industry practice, and apply those indicators to all WSIP projects. The KPI format should produce a green light/yellow light/red light indicator report format that identifies those projects that are proceeding smoothly, and those projects that may require more attention.

Figure 2 Mock-Up of Key Performance Indicator Summary Report

Key Performance Indicator	Indicator Status
Performance Indicator 1	
Performance Indicator 2	

It is important to note that simply because a project that has a "red light" on one or more indicators does not imply that it is being mis-managed, it simply means that the project faces challenges, and must be carefully monitored and managed by PUC staff and stakeholders.

- Develop periodic WSIP KPI reports for review by the Committee.

- Focus attention on those WSIP projects that face the greatest challenges, based on the KPI analysis, by conducting brief audit reviews that concentrate on understanding the challenges that the projects face, how the challenges are being addressed and mitigated by PUC, and any

"how and why" questions concerning changes to the project schedule, scope and budget that have occurred since November 2005.

II. Introduction

On September 21, 2009, the Revenue Bond Oversight Committee (RBOC) approved a contract with the team of Robert Kuo Consulting, RW Block Consulting, Inc. (RWBC) and Lawrence Doyle to conduct a review of a single Water System Improvement Program (WSIP) project, the Sunset Reservoir – North Basin (CUW35801).

In the RBOC's 2007 Financial Review, RBOC's consulting team, which included Robert Kuo Consulting and Larry Doyle, found that for three major WSIP projects, the Calaveras Dam Replacement, the Crystal Springs Bypass Tunnel and the Crocker Amazon Pump Station Upgrade, PUC did not possess the information to provide a clear and comprehensive explanation of the changes in scope, budget and schedule that had occurred between 2002 and 2005. After deliberation, the RBOC decided not to pursue comprehensive explanations for the changes associated with 12 other WSIP projects that had been included in the 2007 consulting scope of work.

Purpose of 2009 Review

With the experience of the 2007 Financial Review in mind, the purpose of the 2009 RBOC Financial Review is to use the Sunset Reservoir-North Basin project as a test case to determine whether the San Francisco Public Utilities Commission (PUC) has developed the capital project reporting capabilities required to permit the RBOC and other interested parties to evaluate whether WSIP projects are meeting budget, schedule and other performance objectives. The 2009 Review also is intended to determine whether budget and schedule changes to the Sunset Reservoir project have been made in accordance with PUC and Controller's Office policies and procedures, and whether the WSIP's current policies and procedures reflect best practices for large infrastructure programs.

Specific Tasks in 2009 Review

The RBOC identified three specific tasks for the consulting team to undertake in the 2009 Review:

Task 1: Review the most current Quarterly Project Status Report provided by the PUC for Project CUW35801 – Sunset Reservoir-North Basin. Evaluate the schedule and describe in detail changes between activities planned, approved and delivered. Basic inquiries to include:

- What changes, if any were required and why?
- Were established protocols followed?
- Were changes documented?
- Were changes adequately reported?

Task 2: Review all budget elements noting any changes to amounts estimated, approved and spent. Examine the propriety of each change against current PUC policies and procedures associated with project management, construction controls, change order authority and any other pertinent policy established by the Commission. Provide an assessment as to whether such changes are allowable, allocable, and reasonable when reviewed against the expenditure of bond proceeds in accordance with existing law. Basic inquiries to include:

- Why were changes, if any, necessary?
- Were proper procedures followed?
- Were changes documented?
- Were changes adequately reported?

Task 3: With respect to completed Tasks 1 & 2, review how the PUC's policies complement those set forth under the Office of the City Controller. Consultant to review and assess how the Commission's internal practices complement those set forth by the Office of the City Controller or requires modification in order to become compliant. Consultant to review and evaluate PUC practices against standard industry practices associated with public infrastructure projects of a similar scope.

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Limitations of 2009 Review's Findings

Although the 2009 Review may identify specific findings or issues with regard to the Sunset Reservoir-North Basin project, is this Report focuses on only a single project, which is of a modest scope and cost compared to other WSIP projects. Therefore, the RBOC should use caution in extrapolating these findings to other WSIP projects, or to the WSIP as a whole. However, the Review may assist the RBOC in identifying issues or questions that it would like to pursue regarding the management of the WSIP, or other specific WSIP projects, in the future.

In addition, where noted, we have relied on statements by PUC staff regarding data sources or the agency's standard practices, and have not independently verified those statements.

Background on Sunset Reservoir – North Basin Project

Sunset Reservoir was originally constructed in 1938, and is located near 28th Avenue and Ortega Street. The Sunset Reservoir – North Basin Project is designed to implement the recommendations of 1996 Utilities Engineering Bureau Seismic Condition of Reservoir Roofs Report to seismically strengthen reservoirs roofs, columns and beams. The roof of the North Basin was identified as the highest priority of all the City Reservoirs for seismic retrofitting. The Sunset Reservoir project was divided into two phases, along with security improvements:

- Phase A - Soil Embankment Stabilization (WD-2397). Phase A included the design and construction of slope stabilization at the embankment of the Reservoir North Basin. This encompassed the excavation of temporary benches along the hillside for construction, including selective demolition of landscaping and site facilities, construction of

approximately 23,000 cubic yards of Cement Deep Soil Mixing columns below the northwest embankment to stabilize the hillside, paving and landscape-irrigation restoration improvements.

- The Phase A design was handled by City engineering staff. Two on-call design consultants augmented the City staff from concepts through engineering services during construction for this design/bid/build project.

- The Phase A construction contractor was the team of Gordon A. Ball/Yerba Buena Engineering. The City provided Resident Engineering (Construction Management) services.

- Phase B - Roof Seismic Retrofit, Reservoir Relining (WD-2406R). Phase B included the design and construction of structural improvements, such as concrete frames and footings, shear walls, steel braces, and a new concrete reservoir lining, and repairs to damaged roof slab and waterproofing of roof surface; civil improvements, such as the construction of drainage improvements, inlet pipe and site fencing; and electrical, irrigation and landscaping improvements.

  - Phase B design services were provided by the City engineering staff augmented by on-call consultant MWH Americas, Inc. for this design/bid/build project.

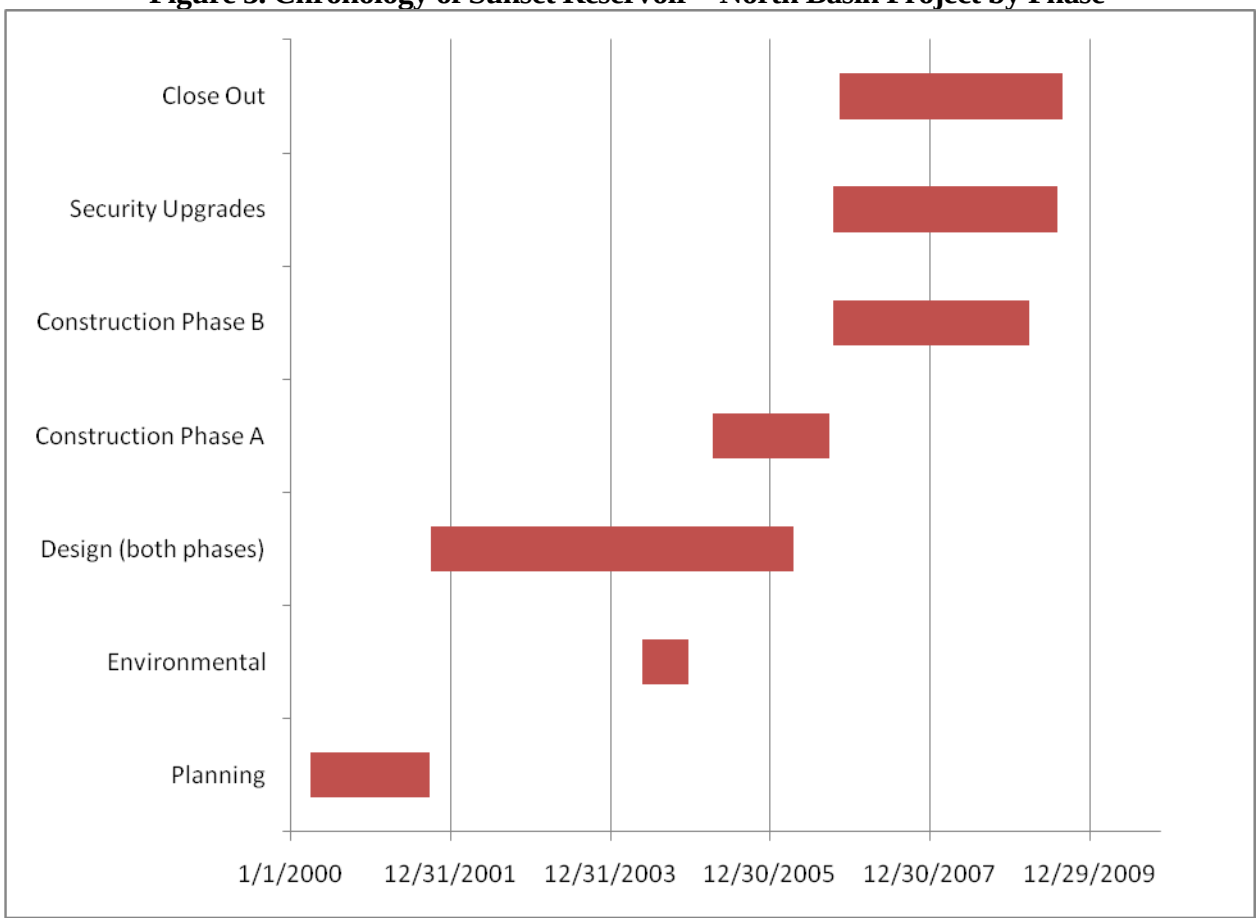
  - The Phase B construction contractor was Shimmick Construction. The City provided Resident Engineering (Construction Management) services.

  Phase A construction began in April 2005, and was completed in September of 2006. Phase B construction began in October 2006 and was completed in March 2009. A more complete discussion of the project schedule, and the schedule changes that occurred, is found in Section III.

- Security Upgrades (WD-2586R-12.00). Following to the completion of the Shimmick contract, the City issued a contract to enhance the site security and comply with Homeland Security guidelines. City forces were used to modify piping and valves. The work completed on November 9, 2009.

The following chart presents a chronology of the Sunset Reservoir – North Basin project by phase.

Figure 3. Chronology of Sunset Reservoir – North Basin Project by Phase



III. Review of Project Schedule Changes

Task 1: Review the most current Quarterly Project Status Report provided by the PUC for Project CUW35801 – Sunset Reservoir-North Basin. Evaluate the schedule and describe in detail changes between activities planned, approved and delivered. Basic inquiries to include:

- Subtask 1-1: What Changes, If Any Were Required And Why?
- Subtask 1-2: Were Established Protocols Followed?
- Subtask 1-3: Were Changes Documented?
- Subtask 1-4: Were changes adequately reported?

Task 1 of this Review provides an evaluation of the schedule changes that have occurred regarding the Sunset Reservoir – North Basin project. The Consulting Team initially reviewed the Quarterly Report for 4th Quarter FY2008/09 to gain an understanding of the project's schedule and status. The schedule shown in Quarterly Report combines Phases A and B of the project in one table and bar chart, which do not distinguish between the phases. However, Quarterly Project Status Reports dating from 2005 and 2006 highlight Phase A construction schedule information in the section entitled "Key Milestone Status – Rolling Six Quarters." In April 2008, the Quarterly Report format was revised, and the Rolling Six Quarters section was relocated to the Milestone tab of the report.

Because Phase A and Phase B each represent distinct capital improvements, with their own construction contracts, we reviewed the contractors' schedules, status narratives, and construction contract change orders in order to obtain information about how and why the schedules for Phase A and Phase B changed over time.

What Changes Were Required And Why?

Schedule Changes for Phase A - Construction Embankment Stabilization

The table below summarizes the changes that occurred in the Phase A construction schedule.

Figure 4. Phase A Construction Contract Schedule Changes
(Gordon N. Ball Construction, and Yerba Buena Engineering, WD-2397)

Base Schedule/Change Order	Schedule/Schedule Change	Reason for Schedule Change
Total Original Time in Base Contract	425 Calendar Days from NTP to Final Completion	
Change Order 6	+110 Days	Schedule impact of weather (heavy rains) and added scope
Total Days Added to Schedule via Change Orders	+ 110 Days	
Total Schedule	535 Days	

Based on the original construction schedule, and the time extension approved in Phase A change order 6, the schedule for the completion of the Phase A improvements was as follows.

Notice to Proceed;	April 11, 2005
Original Final Completion:	June 10, 2006
Actual Final Completion	September 28, 2006

The contractor made the initial claim for a time extension in the winter months of 2005/2006 with insufficient explanation or documentation, as was reported in the March 2006 WSIP Quarterly Report/ Major Issues section. The time extension was processed in February 2007 as part of the final Contract Modification number 6, after construction had been completed and the necessary documentation had been provided to PUC. In addition to the weather delay impacts[4], the contractor requested various time extensions that used project float (or slack time) on non-time critical activities. The activities included owner requested landscaping modifications and sub-drain additions. The net impact was added to the weather delay, and was included in the approved 110-day schedule change.

The detailed descriptions of the causes of the Phase A schedule changes are presented in the table below. "PCO" stands for "proposed change order," and represents a request for a change order submitted by the contractor. In this case, 10 PCO's were combined together in one contract modification that was approved by PUC.

[4] The project's Construction Management group noted that it rained on most days in March and April of 2006.

Figure 5. Causes of Phase A Schedule Change

Description of Cause of Delay	Schedule Impact
Weather (rain delays)	44 Days
Added Scope: Negotiated additional survey work (PCO #1), installation of additional mid-slope sub-drain (PCO #10), installation of additional upper-slope sub-drain (PCO #14), and perform additional compaction method testing (PCO #5)	21 Days
Added Scope: Rockfill change (PCO #6, #12)	36 Days
Added Scope: Landscaping improvement changes (PCO #20, #23, #25, #26)	9 Days
Grand Total	110 Days

Schedule Changes for Phase B Seismic and Other Improvements Schedule

The 110-day delay on Phase A could have caused a delay in the Phase B construction schedule. However, Phase B experienced its own unrelated, concurrent delay in the summer of 2006 during its construction bidding process. The low bidder had an arithmetic error on its bid sheet. PUC elected to rebid the work. This rebid postponed the Phase B start date by three months to the Fall of 2006. In addition, after the construction contract was awarded, four change orders were approved that added a total of 209 days to the original Phase B construction schedule of 690 days.

Figure 6. Summary of Phase B Construction Contract Schedule Changes (Shimmick Construction, WD 2406R)

Base Schedule/Change Order	Schedule/Schedule Change	Reason for Schedule Change
Total Original Time in Base Contract	690 Calendar Days from NTP to Final Completion	
Change Order 1	+25 Days	City delayed Reservoir draining
Change Order 3	+41 Days	Issues with the steel tubes specification
Change Order 4	+ 45 Days	Anchor bolts, rooftop crack repair and sample pump boomlift required Additional time to rectify
Change Order 5	+98 Days	Additional time needed to resolve rooftop crack repair
Total Days Added to Schedule via Change Orders	+ 209 Days	
Total Schedule	899 Days	

Based on the original construction schedule, and the time extensions approved in Phase B Contract Modifications 1, 3, 4 and 5, the schedule for the completion of the Phase B improvements was as follows.

Original NTP	October 10, 2006
Original Final Completion	August 30, 2008
Actual Final Completion	March 26, 2009 (Phase B Contractor completes work)

The detailed description of the causes of the Phase B schedule changes is presented in the table below.

Figure 7. Causes of Phase B Schedule Changes

Description of Cause of Delay	Schedule Impact
Contract Modification #1: The City was responsible for draining the Reservoir, which took longer than originally estimated	25 Days
Contract Modification #3: Covered a design modification to the tube steel braces. The redesign was a result of ultrasonic testing of conducted after construction had begun. The structural consultant recommended the addition of stainless steel angles to act as strengtheners on various tube steel braces. In a negotiated settlement, the City added 41 additional days to the Substantial Completion date for fabricating and installing the braces.	41 Days
Contract Modification #4: Covered a combination of changes, including replacement of anchor bolt beveled washers, refurbishing the sample pump/ boomlift extension and the rooftop crack repairs. The boomlift extension was requested by the City and the beveled anchor bolts were a result of a change in the field. This initial change for roof top crack repairs was at first considered sufficient to remedy the problem. It was later found that the cracking was due to expansion and contraction of the concrete roof slab. As a result, the rooftop repairs were generated by the City on recommendation by their specialty consultant to overcome the unexpected changed field conditions. The contractor performing the application alerted the City of the potential of further delays beyond the contractor's control due to performance of materials during cold/ wet weather. The additional delay is recorded in Contract Modification #5.	45 Days
Contract Modification #5: Added additional time to the schedule, because the fiber reinforcement polymers did not apply well in cold temperatures and required more time than estimated in Contract Modification #4.	98 Days
Grand Total	209 Days

Finding III.1 - We found that PUC provided information that adequately itemized all Phase A and Phase B schedule changes, and identified the reasons why the changes occurred.

PUC provided information that adequately itemized all Phase A and Phase B schedule changes, and identified the reasons why the changes occurred. The reasons are summarized on the contract modification form in a section designated for that purpose.

Risks III.1 - Reasons for Schedule Changes

Not applicable.

Recommendations - Reasons for Schedule Changes

Not applicable.

Were Established Protocols Followed?

Finding III.2 – We found that current PUC policies and procedures were generally followed with the exception of timely modification of change orders/changes that have time implications.

PUC staff has stated that Sunset Reservoir – Phase A was constructed under "old" PUC construction policies and procedures. In contrast, current WSIP projects follow the "new" PUC procedures, which were discussed with the Committee by PUC staff at the October 19, 2009, RBOC meeting. The Sunset Reservoir - Phase B was constructed using "a hybrid of old and new procedures." We found that the appropriate change management protocols were followed at the time that each Phase A and Phase B change order was approved.

There were two procedures governing the Phase A schedule contract modifications:

- The Construction Engineering Contract Modifications Procedure 6.9 Rev 0, dated August 11, 2000; and

- The Project Change Control procedure PM 5.02 Revision 0, dated October 15 2003, for Phase A and Rev 1, dated June 13, 2006, applying to Phase B.

Under these procedures, the PUC Project Manager was permitted to approve Milestone Schedule Impact changes within a phase level. The Phase A schedule changes were reviewed by the Resident Engineer, confirmed by the Lead Cost Estimator as required and approved by the Project Manager, in accordance with the procedures.

We evaluated whether the Phase B schedule changes were implemented in accordance with the PUC change management procedures that were in place as of 2006 through 2008:

- The Project Change Control procedure PM 5.02 Revision 1, which took effect on June 13, 2006; and

- The Project Change Control procedure PM 5.02 Revision 2, which took effect on September 6, 2008.

Prior to the adoption of the Change Control procedures revision in 2008, the PUC Project Manager was required to approve Milestone Schedule Impact changes within a phase level. Change Orders 1, 3 and 4 were reviewed by the Resident Engineer, confirmed by the Lead Cost Estimator as required, and approved by the Project Manager, in accordance with this procedure.

Following the adoption of the revised Change Control procedures in 2008, the schedule change proposal for Contract Modification #5 from the contractor was reviewed by the Construction Schedule/ Cost Specialist and agreed to by the Project Construction Manager (Resident Engineer) in accordance with the new procedures. Since they affected the date of substantial completion, the Phase B schedule changes were approved by the Commission under Resolution 09-0116 on July 14, 2009, as part of the June 2009 update of the WSIP program in accordance with the procedure.

Risks III.2 - Whether Protocols Were Followed

Although schedule change procedures associated with Phase A were followed, there was a time lag in processing the contract modifications. The practice of not identifying changes in a timely manner has the effect of approving history rather gaining concurrence prior to the event. This practice places those in a position to approve the change with no options except to rubber stamp the request.

Recommendations III.2 - Whether Protocols Were Followed

We recommend that there be no more than a one month delay in reporting potential time impacts. On Phase B, the project accepted known scope changes as they were recognized and processed the time changes in advance of the event. This should be PUC's standard practice.

Were Project Schedule Changes Documented?

Finding III.3- Were Project Schedule Changes Documented

The changes to the Phase A schedule were included in the proposed change order (PCO) documentation and referenced on the contract modification. The changes to the Phase B schedule were adequately documented. A discussion of the reasons and an analysis by the project team was included in the contract modifications.

Risks III.3 - Were Project Schedule Changes Documented

Not applicable.

Recommendations III.3 - Were Project Schedule Changes Documented

Not applicable.

Were Project Schedule Changes Adequately Reported?

Finding III.4 – We found that changes to the Phase A and Phase B schedule were adequately reported. We also found that there was some confusion in the reporting of the Phase A schedule regarding the definition of the term "completion," that is, whether the term was referencing final or substantial completion.

The change to the Phase A schedule was adequately reported in the WSIP Quarterly Project Status Reports. When the potential impact of the rain delay was recognized, it was reported in the March 2006 (4th Quarter FY 07/08) Quarterly Report Project Status. However, in the Quarterly Reports, there was some confusion regarding which completion date was being affected. In the December 2005 Report, the milestone "Substantial Completion" is shown with a forecast to complete of April 21, 2006. In the next WSIP Quarterly Report, dated March 2006, the milestone Final Completion date is reported as October 25, 2006 with no follow up on the Substantial Completion date except to list it as having been expected in the Next/ Upcoming Quarter.

Regarding Phase B, the rooftop crack repair and the impact of cold temperatures on the fiberglass reinforced polymers roof strengthening were initially identified as schedule issues in the "Major Issues" section of the 1st Quarter FY2008/09 Quarterly Report. The initial assessment was that these issues would require 5 weeks (35 calendar days) of additional construction time prior to adoption of a final solution. The combined impact was reflected in Contract Modifications 4 and 5 for a total extension of 143 days. However, the reports were clear that the solution was a work in progress. The cost of the fiberglass polymer roof replacement was $580,000.

Risks III.4 - Whether Project Schedule Changes Were Reported

The WSIP program has a multitude of projects, with each project managed by an individual team. It is easy for the individual project teams to lose sight of the audience for the WSIP quarterly reports. Modifying the detail presented, or changing the milestones reported upon, without an explanation of why the change is occurring, can cause confusion for the stakeholders and members of the public who rely upon the Quarterly Report as a source of information on the status of specific WSIP projects.

Recommendations III.4 - Whether Project Schedule Changes Were Reported

Establish one consistent format for reporting the schedule on the quarterly reports and accompanying standard definitions. When reporting on projects with construction phases, include a bar for each phase rather than combining all construction into one bar.

IV. Assessment of Project Budget Changes, Project Expenditures, and Compliance with Policies and Procedures

Task 2: Review all budget elements noting any changes to amounts estimated, approved and spent. Examine the propriety of each change against current SFPUC policies and procedures associated with project management, construction controls, change order authority and any other pertinent policy established by the Commission. Provide an assessment as to whether such changes are allowable, allocable, and reasonable when reviewed against the expenditure of bond proceeds in accordance with existing law. Basic inquiries to include:

- Subtask 2-1: Why were changes, if any, necessary?
- Subtask 2-2: Were proper procedures followed?
- Subtask 2-3: Were changes documented?
- Subtask 2-4: Were changes adequately reported?

Task 2 provides an assessment of:

- The budget changes that have occurred in connection with the Sunset Reservoir – North Basin project since the adoption of the WSIP baseline budget and schedule in November 2005;
- Whether the PUC has followed its own written policies and procedures in the management of the project, and the approval and documentation of any budget changes to the project; and
- The propriety of project expenditures.

The following sections of the report address each of these issues.

Review of Project Budget Changes

The Commission adopted updates to the WSIP program in November 2005, December 2007 and June 2009, each of which included changes to the Sunset Reservoir project's budget. As a result, we divided our Task 2 budget inquiries into two categories:

1. Questions regarding phase-level budget changes from the November 2005 project budget to December 2007 update of the project budget that was adopted by the Commission; and

2. Questions regarding phase-level changes from the project budget adopted in December 2007 to the update that was approved by the Commission in June 2009, which in the case of the Sunset Reservoir, reflect the PUC's forecast at completion for the project.

Below, we have summarized the questions that we posed, and the responses that PUC provided. In general, we have provided PUC responses verbatim, or with minor edits for the sake of clarity.

Following each question and response, where appropriate, we have provided our comments regarding how PUC's responses could be improved to more clearly explain why a particular budget change was necessary. We have also included summary-level findings, risks and recommendations.

Review of Phase-Level Budget Changes from November 2005 to December 2007

The Commission approves the overall project budget, and delegates the allocation of phase-level budgets to PUC staff. Between the adoption of the November 2005 WSIP budget and the adoption of the December 2007 WSIP budget, the Sunset Reservoir-North Basin project budget increased by over $3.9 million, from approximately $62.0 million to $65.9 million.

The table below summarizes the phase-level budget changes that occurred between November 2005 and December 2007 at the phase-level.

Figure 8. Summary of Changes in Project Budget, 2005 - 2007

Data from WSIP Quarterly Project Status Report dated February 20, 2009, Section 3.5, page 3

Project Phases	2005 WSIP Budget	2007 WSIP Budget	Change From 2005 to 2007	% Change from 2005
Project Management	$2,172,000	$2,708,000	$536,000	25%
Planning	$309,000	$309,000	$0	0%
Environmental	$4,000	$4,000	$0	0%
Right of Way	$0	$0	$0	
Design	$4,068,000	$2,646,000	($1,422,000)	-35%
Bid & Award	$61,000	$112,000	$51,000	84%
Construction Management	$7,409,000	$6,313,000	($1,096,000)	-15%
Construction	$47,632,000	$53,506,000	$5,874,000	12%
Close Out	$321,000	$325,000	$4,000	1%
Total	$61,976,000	$65,923,000	$3,947,000	6%

The major changes between 2005 and 2007 occurred in the project management, design, construction management and construction phases. Based on our review of these phase level budget changes, the questions that we submitted to PUC were:

- Why was the budget for the Project Management phase increased by over 25% or $536,000 between 2005 and 2007?

- Why was the Design phase budget decreased by $1.4 million or 35%?

- Why was the Construction Management phase budget decreased by nearly $1.1 million or 15%?

- Why were the Design and Construction Management phase budgets decreased by these amounts at the same time that the project's construction budget was increased by almost $5.9 million or 12%? [Note: typically, estimates of design, construction management and construction cost estimates move in the same direction.]

Questions and Answers Regarding Phase-Level Budget Changes from 2005 to 2007

Figure 9. Project Management Phase, 2005 to 2007

Question on Project Management Phase:

Why was the budget for the Project Management phase increased by over 25% or $536,000 between 2005 and 2007?

PUC Response:

The budget for Project Management in 2005 (as referenced in the *"Original Budget"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 2009*), includes Project Management costs for the Design Phase, the Bid and Award Phase, and the Construction Phase; but does not include legal and operations support for the project as shown in detail below:

[Response continues on next page]

December 2005 ("Original Budget")

Project Management	***$***	***2,172,000***
PM for Design		included above
PM for Bid & Award		included above
PM for Construction Management		included above
Planning	***$***	***309,000***
Pre-Design Planning Cost	$	309,000
Environmental	***$***	***4,000***
Environ. Planning and Review Cost	$	4,000
Design/Bid and Award	***$***	***4,129,000***
Engineering Design Fees	$	4,129,000
Construction Management	***$***	***7,409,000***
Engineering Support for CM	$	6,946,000
OPS Support	$	463,000
Construction	***$***	***47,632,000***
Construction Base Bid	$	42,067,000
Construction Contingency	$	4,207,000
Avoidance & Mitigation Costs	$	1,346,000
Art Commission Fees	$	12,000
Close-Out	***$***	***321,000***
PM for Close Out	$	321,000
Total	***$***	***61,976,000***

Note that all phases are shown in the response to this question. All subsequent responses will deal only with the phases in question.

During the period between December 2005 and December 2007, an amount of approximately $85,000 for operations support was transferred from the Construction Management Phase to Project Management. $75,000 was added to the Project Management for legal support. In addition to these revisions, the cost for Project Management was increased by approximately $376,000 to reflect revised Project Management forecasts (this increase was later reduced). Part of the reason for higher Project Management costs was that the Phase A (WD-2397) construction was delayed 110 days due to heavy rains and additional work. Phase A construction reached final completion in early 2006. Also, there were additional Project Management expenses associated with the 3-month long Phase B (WD-2406R) contract re-biding effort in 2006.

As a result of these increases, the approved budget for Project Management in 2007 (as referenced in the *"Approved Budget"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 2009*), increased from $2,172,000 to $2,708,000. This revised budget is broken down into detail below:

December 2007 ("Approved Budget")		
Project Management	***$***	***2,708,000***
PM for Design	$	556,000
PM for Bid & Award	$	78,000
PM for Construction Management	$	1,915,000
Legal	$	75,000
OPS Support	$	85,000
Planning	***$***	***309,000***
Pre-Design Planning Cost	$	309,000
Environmental	***$***	***4,000***
Environ. Planning and Review Cost	$	4,000
Design/Bid and Award	***$***	***2,758,000***
Engineering Design Fees	$	2,758,000
Construction Management	***$***	***6,313,000***
Engineering Support for CM	$	1,730,000
Construction Mgmt & Contract Admin Cost	$	4,583,000
Construction	***$***	***53,506,000***
Construction Base Bid	$	49,191,000
Construction Contingency	$	4,179,000
Avoidance & Mitigation Costs	$	-
Art Commission Fees	$	12,000
Security	$	124,000
Close-Out	***$***	***325,000***
PM for Close Out	$	325,000
Total	***$***	***65,923,000***

Comments on PUC's Explanation of Project Management Phase Changes, 2005 to 2007

- PUC's response does a good job of presenting the components of the 2007 project management phase budget, disaggregating line-items for design, bid and award, construction management, legal and operations support, and identifying the factors that resulted in an increase in the 2007 budget (increases due to the impact of weather and Phase B rebidding delays, and adding budget elements from other phases),
- This response could have been improved if it included an explanation of how the 2005 Project Management budget was developed. The response notes that in 2005, project management services for design, bid and award and construction management were included in the $2.17 million phase budget, but were not disaggregated.

In addition, the response could have been improved if it described why the line-item budget changes occurred. For example, the reasons for shifting funding for Operations Support from Construction Management to Project Management could have been described. The reasons for adding legal support funding to this phase also could have been described.

- As discussed below in connection with Figure 13, the 2007 budget for project management costs included $1 million in contingency. This is discussed in some detail in PUC's response regarding the project management phase budget change from 2007 to 2009, but it would have

been useful for this response to identify how much contingency was included in the 2005 and 2007 budgets, as context for the later discussion.

Figure 10. Design Phase, 2005 to 2007

Question on Design Phase:

Why was the Design phase budget decreased by $1.4 million or 35%?

PUC Response:

The budget for the Design Phase in 2005 (as referenced in the *"Original Budget"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 /2009*) is $4,068,000, including Pre-CIP design costs ($1,276,000—including Phase A design), Phase B design costs consultant (MWH) fees, City engineering resources, including civil, structural, and electrical engineers, and DPW architectural and engineering support (City resources and consultant costs not including Pre-CIP design costs total approximately $2,491,000). The original budget also included approximately $310,000 of design contingency (Activity ID A602690, *"CN Contingency"*, in *Monthly WSIP Reports*), as shown below:

December 2005 ("Original Budget")

Design/Bid and Award	***$***	***4,068,000***
Pre-CIP Design	$	1,267,000
Design Consultant (MWH), City Resources, DPW	$	2,491,000

In early 2006, the design effort for Phase B (WD-2406R) was coming to a close. The design team was more efficient than was anticipated. As a result, City resources and consultants costs for the Design phase were forecast to be completed $1,155,000 lower, and unneeded design contingency was reduced by $267,000. Since the Pre-CIP Design costs are actual costs, this amount did not change.

As a result of these changes, the approved budget for the Design Phase in 2007 (as referenced in the *"Approved Budget"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 2009*), decreased from $4,068,000 to $2,646,000. This revised budget is broken down into detail below:

December 2007 ("Approved Budget")

Design/Bid and Award	***$***	***2,646,000***
Pre-CIP Design	$	1,267,000
Design Consultant (MWH), City Resources, DPW	$	1,336,000

Comments on PUC's Explanation of Design Phase Changes, 2005 to 2007

- This response does not adequately explain why the budget for Phase B design was reduced from approximately $2.5 million in November 2005 to approximately $1.3 million in

December 2007, and raises additional questions regarding why a variance of this magnitude occurred.

- As of November 2005, the Phase A design was complete, so all of the variance in design phase budgets between 2005 and 2007 should be explained by changes to the Phase B design costs. PUC's response indicates that Phase B design was "coming to a close in early 2006."
    - One would assume that developing a November 2005 design phase estimate based on actual Phase B design expenditures through the fall of 2005 would have produced a more accurate November 2005 design budget. By that point, assuming that a substantial percentage of Phase B design was complete, the November 2005 budget should have been able to reflect actual expenditures to date for all of Phase A and most of Phase B design. So in this context, a $1.2 million budget reduction in this phase from 2005 to 2007 is surprising.
    - However, PUC's response only indicates that "The design team was more efficient than was anticipated." Typically, a large under-run of this nature is due to either highly conservative budgeting, or a reduction in scope. We do not know of any scope reductions that would have accounted for this level of savings.
    - PUC's response would have been greatly improved if it had addressed why, given how much of the design was already completed by November 2005, the 2005 phase budget was so inaccurate. One hypothesis is that the data concerning the status of the project design (both in terms of percentage complete and amount spent to date) on which the 2005 design budget was based was out of date or inaccurate. Otherwise, we would have expected to see a much smaller variance between 2005 and 2007.

Figure 11. Construction Management Phase, 2005 to 2007

Question on Construction Management Phase:

Why was the Construction Management phase budget decreased by nearly $1.1 million or 15%?

PUC Response:

The budget for the Construction Management Phase in 2005 (as referenced in the *"Original Budget"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 2009*) is $7,409,000, including engineer support and operations support, as shown below:

December 2005 ("Original Budget")

Construction Management	***$***	***7,409,000***
Engineering Support for CM	$	6,946,000
OPS Support	$	463,000

During the period between December 2005 and December 2007, the operations support budget was reduced from $463,000 to $85,000 and was transferred from the Construction Management Phase to Project Management. In addition to this revision, cost for Construction Management was broken down into engineering support and construction management and contract

administration costs, with a reforecast from the Construction Management Bureau reducing this cost from $6,946,000 to $6,313,000.

As a result of these changes, the approved budget for the Construction Management Phase in 2007 (as referenced in the *"Approved Budget"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 2009*), decreased from $7,409,000 to $6,313,000. This revised budget is broken down into detail below:

December 2007 ("Approved Budget")

Construction Management	***$***	***6,313,000***
Engineering Support for CM	$	1,730,000
Construction Mgmt & Contract Admin Cost	$	4,583,000

Comments on PUC's Explanation of Construction Management Phase Changes, 2005 to 2007

- This response shows how the line-items within the construction management phase changed between 2005 and 2007. However, it does not fully address why the budget change occurred.
  - The response could have described the rationale for transferring funding for Operations Support from the Construction Management phase to the Project Management phase.
  - It would have been helpful for PUC to begin this response with an explanation of how the 2005 Construction Management budget for engineering support was developed. For example, was the $6,946,000 budget based on a percentage of the 2005 construction base bid, which was $53.5 million (roughly 13 percent)? A discussion of any differences in budget methodology could have helped explain why the 2005 phase budget was higher than the 2007 budget.
  - PUC's response indicates that PUC's Construction Management Bureau "reforecast" the budget for construction management for the 2007 budget. The response could have cited the factors identified by the Construction Management Bureau in their reforecast to help explain this budget change, which also could have aided in addressing why the budget was reduced.

Figure 12. Construction Phase, 2005 to 2007

<u>Question on Construction Phase</u>:

Why were the Design and Construction Management phase budgets decreased by these amounts at the same time that the project's construction budget was increased by almost $5.9 million or 12%?

PUC Response:

The budget for the Construction Phase in 2005 (as referenced in the *"Original Budget"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 2009*) is $47,632,000, including construction base bid (Phase A based on actual bid and Phase B based on estimate), construction contingency, avoidance and mitigation costs[5], and Art Commission fees, as shown below:

December 2005 ("Original Budget")

Construction	***$***	***47,632,000***
Construction Base Bid	$	42,067,000
Construction Contingency	$	4,207,000
Avoidance & Mitigation Costs	$	1,346,000
Art Commission Fees	$	12,000

In 2006, the apparent low bid for Phase B construction had a clerical error.

Bid Date:	06/08/06
Contract No.:	WD-2406
Estimated Amount:	$32 - $42 Million

	CONTRACTORS	**BASE BID**
1	Shimmick Construction	$ 18,538,100
2	West Bay Builders	$ 39,929,100
3	SJ Amoroso Construction	$ 44,327,000
4	Monterey Mechanical	$ 49,494,000
5	Ranger Pipelines	$ 49,800,041

[5]Regarding the purpose of the "Avoidance and Mitigation" line-item, PUC provided the following excerpt from the *WSIP Cost and Schedule Basis and Assumptions*, dated March 2005, which describes the original purpose for the Environmental Mitigation budget:
"Environmental mitigation costs are costs of mitigating for environmental impacts that may be identified during the environmental review of each WSIP project. Potential specific environmental impacts and associated mitigations of the various WSIP projects [at the time of the report] *cannot yet be identified. Therefore, these estimated mitigation costs are intended to provide budgeted funding for eventual mitigation work. The estimates are based on professional knowledge and judgment of what is known at this early stage about:*
- each project and project description,
- the scheduled duration of construction of each project,
- the project location, habitat, and potentially associated special status species,
- associated SFPUC staff for monitoring and reporting, and
- consulting, and potential habitat compensation costs."

Apparent Low Bidder: **Shimmick Construction** **$ 18,538,100**

Due to the clerical error in the original low bid, the contract was rebid. One contractor dropped out during the re-bid decreasing the competition, which may have led to higher bid amounts (rapidly increasing construction material costs and the process of re-bidding likely both had an impact on the Construction Phase costs as well). The low re-bid was about $4 Million higher than the original low bid. The re-bid pushed the construction costs a few million dollars over the budgeted amount necessitating a budget increase. The Engineer's Estimate for WD-2406R was about $41.8 Million. A $124,000 budget for security was also added to the Construction Phase.

[The detailed results of the re-bid are presented in the table that follows this response].

As a result of these changes, the approved budget for the Construction Phase in 2007 (as referenced in the *"Approved Budget"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 2009*), increased from $47,632,000 to $ $53,506,000. This revised budget is broken down into detail below:

December 2007 ("Approved Budget")

Construction	***$***	***53,506,000***
Construction Base Bid	$	49,191,000
Construction Contingency	$	4,179,000
Avoidance & Mitigation Costs	$	-
Art Commission Fees	$	12,000
Security	$	124,000

The rebid process had no additional effect on the CM budget (nor did the economics of the construction industry), since construction duration and CM resources did not change as a result of higher Construction Phase costs.

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Figure 13. Rebid Results for Sunset Reservoir –Phase B Construction Contract

					Engineer Estimate		Shimmick Construction		West Bay Builders		S.J. Amoroso		Monterey Mechanical
Bid Item	**Bid Item Description**	**Est. Qty**	**Unit**	**Unit Cost**	**Extension**	**Unit Cost**	**Amount**	**Unit Cost**	**Amount**	**Unit Cost**	**Amount**	**Unit Cost**	**Amount**
1	Mobilization	1	LS		100,000		100,000		100,000		100,000		100,000
2	Demobilization	1	LS		100,000		100,000		100,000		100,000		100,000
3	Performance Bond and Payment Bond	1	LS		525,000		300,000		389,000		369,044		310,000
4	Insurance	1	LS		350,000		180,000		354,000		534,491		300,000
5	Resident Engineer's Field Office	1	LS		125,000		170,000		130,000		152,100		120,000
6	Seismic Retrofit Work	1	LS		19,657,589		24,200,000		25,130,000		24,833,783		29,770,800
7	Repair of Concrete Spalling on Exterior Roof Slab	1,800	SF	80	144,000	30	54,000	29	52,200	34	61,200	35	63,000
8	Repair of Concrete Roof Soffit Spalling	17,000	SF	160	2,720,000	46	782,000	65	1,105,000	69	1,173,000	70	1,190,000
9	Repair of Concrete Spalling on Joists (Type I Repair)	4,100	LF	160	656,000	47	192,700	116	475,600	134	549,400	125	512,500
10	Repair of Concrete Spalling on Joists (Type II Repair)	1,400	LF	200	280,000	60	84,000	143	200,200	157	219,800	158	221,200
11	Repair of Concrete Spalling on Joists (Type III Repair)	2,500	LF	240	600,000	95	237,500	163	407,500	177	442,500	180	450,000
12	Repair of Roof Construction Joints	43,000	LF	10	430,000	3	129,000	4	172,000	3.40	146,200	5	215,000
13	Crack Sealing on Reservoir Roof	100,000	SF	3	300,000	3	300,000	2.40	240,000	3	300,000	2.50	250,000
14	Protective Coating for Reservoir Roof		LS		1,545,000		900,000		1,180,000		1,405,872		1,200,000
15	Concrete Lining Overlay Over Flat Area of Reservoir Floor		LS		3,436,000		4,500,000		4,365,000		3,337,197		6,200,500

Rebid Results for Sunset Reservoir – North Basin Phase B Construction Contract, cont.

					Engineer Estimate		Shimmick Construction		West Bay Builders		S.J. Amoroso		Monterey Mechanical
16	Epoxy Injection of Cracks on Sloped Area of Reservoir Floor	6,000	LF	100	600,000	21	126,000	20.25	121,500	24	144,000	23	138,000
17	Repair of Construction Joints on Sloped Area of Reservoir Floor	20,000	LF	12	240,000	9	180,000	8.40	168,000	8	160,000	9	180,000
18	Cementitious Waterproofing on Sloped Portion of Reservoir Floor		LS		1,212,000		545,000		528,000		617,706		700,000
19	Epoxy Injection of Cracks on the Reservoir Perimeter Wall	200	LF	100	20,000	40	8,000	34.50	6,900	40	8,000	40	8,000
20	Seismic Joints		LS		1,656,035		2,500,000		2,100,000		1,761,103		600,000
21	Access Structures and Ramp		LS		453,661		650,000		542,000		1,365,605		2,000,000
22	Miscellaneous Metal Work		LS		226,000		700,000		390,000		453,927		200,000
23	Inlet Pipe		LS		371,764		600,000		518,000		349,713		400,000
24	Sampling Station		LS		38,138		20,000		45,000		43,875		50,000
25	Site Drainage Improvements		LS		398,343		460,000		531,000		910,553		1,200,000
26	Shoring		LS		166,404		25,000		30,000		52,650		30,000
27	Fencing		LS		837,000		700,000		1,100,000		1,348,499		900,000
28	Doors and Hardware		LS		53,900		40,000		20,000		24,933		20,000
29	Irrigation System		LS		351,000		400,000		345,000		406,575		100,000
30	Landscaping Work		LS		540,000		400,000		426,000		619,737		300,000
31	Electrical Work		LS		1,926,000		750,000		779,000		1,044,810		600,000
32	Paving		LS		697,480		450,000		568,000		1,740,317		300,000
33	Lead Paint Abatement		LS		15,000		6,000		50,000		49,140		81,500
34	Allowance for Arborist Services		AL		100,000		100,000		100,000		100,000		100,000
35	Allowance for Disposal of Hazardous Soil During Construction		AL		100,000		100,000		100,000		100,000		100,000

Rebid Results for Sunset Reservoir – North Basin Phase B Construction Contract, cont.													
					Engineer Estimate		Shimmick Construction		West Bay Builders		S.J. Amoroso		Monterey Mechanical
36	Allowance to Furnish, Equip, and Maintain Engineer's Field Office		AL		12,500		12,500		12,500		12,500		12,500
37	Allowance for Additional Concrete Repair		AL		100,000		100,000		100,000		100,000		100,000
38	Allowance for Independent Inspection and Testing		AL		350,000		350,000		350,000		350,000		350,000
39	Allowance for Inspection and Repair of Mechanical Equipment		AL		100,000		100,000		100,000		100,000		100,000
40	Allowance for Sediment Removal and Disposal		AL		100,000		100,000		100,000		100,000		100,000
41	Allowance for Removal & Reinstallation of Solar-Powered Mixer		AL		15,000		15,000		15,000		15,000		15,000
42	Well Piping		LS		124,500		110,000		129,000		76,050		180,000
	TOTAL PRICE				41,773,314		41,776,700		43,675,400		45,779,280		49,868,000

*Note: LS = Lump Sum, EA = Each, LF = Linear Feet, SF = Square Feet, CY = Cubic Yards, AL = Allowance

Comments on PUC's Explanation of Construction Phase Changes, 2005 to 2007

- The fact that the 2005 budget was developed before the 2006 bidding process for Phase B explains why the construction budget increased significantly after construction on the project (Phase A) had commenced.
- The explanation that the changes in the construction phase budget were driven by the re-bid of the Phase B construction contract, when combined with the results of the re-bid of Phase B construction, provides a reasonable explanation for the increase in the $5.9 million increase in the construction budget from 2005 to 2007.
- PUC's response that increased construction costs resulting from the Phase B rebid process did not have an impact on Construction Management (or design) costs makes sense, given that the scope of Phase B construction had not changed, only its cost through the re-bid process.

Review of Phase-Level Budget Changes from December 2007 to June 2009

The table below summarizes the phase-level budget changes that occurred between December 2007 and June 2009 at the phase-level.

Figure 14. Project Budget for Sunset Reservoir – North Basin, 2007 to 2009
Data from WSIP Quarterly Project Status Report (4th Quarter of FY2009)
dated August 20, 2009, Section 3.5, page 5

Project Phases	2005 Budget	2007 Budget	June 2009 Budget *	Variance – 2009 vs. 2007
Project Management	$2,172,000	$2,708,000	$1,674,000	($1,034,000)
Planning	$309,000	$309,000	$309,000	$0
Environmental	$4,000	$4,000	$4,000	$0
Right of Way	$0	$0	$0	$0
Design	$4,068,000	$2,646,000	$2,591,000	($53,000)
Bid & Award	$61,000	$112,000	$112,000	$0
Construction Management	$7,409,000	$6,313,000	$6,389,000	$93,000
Construction	$47,632,000	$53,506,000	$52,723,000	($802,000)
Close Out	$321,000	$325,000	$533,000	$208,000
Total	$61,976,000	$65,923,000	$64,335,000	($1,588,000)

* For the Sunset Reservoir project, the June 2009 project budget reflects the current Forecast at Completion.

Based on our review of the project's budget history from December 2007 through June 2009, the project phase-level questions that we posed to PUC were:

- Project Management Phase - Why is the June 2009 budget for the project management phase approximately $1.0 million lower than the 2007 Budget?
- Planning Phase - No variance in 2007 budget vs. 2009 budget. Explain what planning expenses were incurred, and how planning expenses were documented?
- Environmental Phase - No variance in 2007 budget vs. 2009 budget. Explain what environmental expenses were incurred, and how were environmental expenses documented?
- Bid & Award Phase - No variance in 2007 budget vs. 2009 budget. Explain what expenses were included in this phase, and how they are documented?
- Construction Management Phase – Why is the December 2007 phase budget is $93,000 higher than the 2009 budget?

- Construction Phase - Why is construction 2007 budget $802,000 higher than the 2009 phase budget?

- Close Out Phase - Why has the 2009 budget increased to $533,000 compared to the 2007 phase budget of $325,000?

PUC's responses to these questions are presented below.

Figure 15. Project Management Phase, 2007 to 2009

Question on Project Management Phase:

Project Management: Why is the June 2009 for the project management phase approximately $1.0 million lower than the 2007 Budget? $1 million in contingency for only the Project Management phase appears high. What was the rationale for a $1 million contingency in this phase? What is the percentage of contingency to construction costs for this phase?

PUC Response:

The Phase B WD-2406R (Sunset Reservoir – seismic and other improvements) construction cost was $41.8 million as bid. The percentage of Project Management contingency (assuming $1 Million for contingency) to construction costs ($41.8 Million) was 2.3%. For the Project Management Phase, contingency is not broken out and is included in remaining cost.

The budget for Project Management in 2007 is explained in the response above (and referenced in the *"Approved Budget"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 2009*) and shown below:

December 2007 ("Approved Budget")

Project Management	***$***	***2,708,000***
PM for Design	$	556,000
PM for Bid & Award	$	78,000
PM for Construction Management	$	1,915,000
Legal	$	75,000
OPS Support	$	85,000

During the period between December 2007 and March 2009, the Project Management costs were reforecast and it was determined that legal support would not be required on the project. Upon completion of Phase B construction in late 2008 and early 2009, it was determined that a portion of Project Management "contingency" totaling $959,000 would not be needed, and the forecast was revised to reflect this. The legal support budget of $75,000 was reduced to zero.

As a result of these changes, the current forecast for the Project Management Phase in March 2009 (as referenced in the *"Current Forecast"* column in Section 3.5 – Page 3 in the *WSIP Regional Projects Quarter Report 3rd Quarter – Fiscal Year 2008 2009*), decreased from $2,708,000 to $1,674,000. This revised budget is broken down into detail below:

March 2009 ("Current Forecast")		
Project Management	***$***	***1,674,000***
PM for Design	$	556,000
PM for Bid & Award	$	78,000
PM for Construction Management	$	956,000
Legal	$	-
OPS Support	$	85,000

Comments on PUC's Explanation of Project Management Phase Changes, 2007 to 2009

- This response would have been strengthened if it included a discussion of why $959,000 in contingency was included in the 2007 budget for this phase, apparently under the "PM for construction management" line-item. This discussion could have described the types of issues or situations that this contingency was created to address. PUC's response indicates that the contingency equaled approximately 2.3% of construction costs, but does not indicate whether this level of contingency is typical for reservoir projects, or differs from PUC's standard practice. Without a fuller discussion of this topic, the response regarding project management is incomplete.

Figure 16. Planning Phase, 2007 to 2009

Question on Planning Phase:

Explain what planning expenses were incurred, and how planning expenses were documented? [Note: There was no variance in the Planning Phase 2007 budget vs. 2009 budget]. Were all planning expenses incurred by City staff? Were expenses incurred by City employees outside of PUC (e.g. DPW)? For any expenses incurred by other departments, were work orders established? What is the process used to allocate historical expenses to projects from FAMIS? We note that allocated costs may not reflect actual planning effort.

PUC Response:

This project dates back to 1999 (pre-WSIP). The Planning Phase expenses include all planning costs incurred starting with the Project Kick-off Meeting and ending with the Issuance of the Conceptual Engineering Report (CER). The Planning Phase was completed on 09/28/01. All of the expenses incurred in this phase are pre-CIP allocations from FAMIS (historical costs), reflecting the fact that some of the Planning Phase activities predated the WSIP. These expenses were documented in monthly and quarterly reports and are in P6 under the Planning Phase and in FAMIS under CUW35801PL. The Conceptual Engineering Report (CER) used consultants SOHA and OCC (see contract documents previously sent on DVD).

Comments on PUC's Explanation of Planning Phase Changes, 2007 to 2009

This response is adequate. No comments.

Figure 17. Environmental Phase, 2007 to 2009

Question on Environmental Phase:

Explain what planning expenses were incurred, and how planning expenses were documented? [Note: There was no variance in the Environmental Phase 2007 budget vs. 2009 budget]. Were environmental expenses incurred by City staff and consultants to PUC? Were expenses incurred by City employees outside of PUC (e.g. City Planning)? For any expenses incurred by other departments, were work orders established?

PUC Response:

The Environmental Phase expenses include all environmental costs incurred starting with the completion of the CEQA List and ending with the certification of the Environmental Review process. The San Francisco Planning Department has determined that this project requires a Categorical Exemption (Cat Ex). The Environmental Phase was completed upon approval of a Categorical Exemption on 12/21/04. The Categorical Exemption was revised on 03/31/06. A large percentage of expenses incurred in this phase are associated with environmental planning resources. These expenses were documented in monthly and quarterly reports and are in detail in P6 under the Environmental Phase and in FAMIS under CUW35801ER.

WIP (pre-WSIP) staff worked on the Environmental Phase of the project via CS-524 Task Order 85-3 Rev B (note: contract task order was provided to Consulting Team on DVD). Environmental costs were incurred for City staff such as SFPUC Bureau of Environmental Management (BEM) and City Major Environmental Analysis (MEA). MEA was given a SFPUC index code for the Categorical Exemption so a work order was unnecessary.

Comments on PUC's Explanation of Environmental Phase Changes, 2007 to 2009

This response is adequate. No comments.

Figure 18. Bid & Award Phase, 2007 to 2009

Question on Bid & Award Phase:

Explain what bid and award expenses were incurred, and those expenses were documented? [Note: There was no variance in the bid and award phase 2007 budget vs. 2009 budget]. Were these Bid &Award expenses incurred by PUC Infrastructure staff, Contracts/Procurement staff, and City attorney staff? Do these expenses reflect actual hours of time for each employee involved in the Bid & Award process? Were these costs allocations from FAMIS? If so what was the methodology used to allocate to projects – this question goes to charges reflecting actual work being performed on a project.

PUC Response:

The Bid & Award Phase expenses include all bid and award costs incurred starting with the completion of 100% design and ending with the notice-to-proceed to the Construction Phase contractor. A large percentage of cost incurred in this phase is associated with the preparation of contract documents. These expenses were documented in monthly and quarterly reports and are

broken down into detail Phase A (Embankments) and Phase B (North Basin) in P6 under the Bid & Award Phase and in FAMIS under CUW35801DS.

Yes, Bid & Award expenses were incurred by SFPUC Water Infrastructure staff, SFPUC Contract Administration Bureau (CAB) staff and the City Attorney. The SFPUC costs reflect actual hours worked on the Bid & Award phase. The City Attorney costs, based on actual hours, were associated with review of contract documents and legal advice on a Phase B threatened bid protest. Also, there were some outside expenses for contract reproduction, newspaper advertising, and trade journal advertising.

Follow-Up Question On Bid & Award Phase

Typically, the design team is responsible for preparing many of the contract documents. If "a large percentage of the Bid and Award phase budget increase was due to re-writing the front end "boilerplate" of the contract documents, why was this necessary? What portion of the contract documents were re-written?

PUC Response:

The largest percentage of the Bid and Award Phase budget was not due to re-writing the Phase B front end "boiler plate". There were changes made throughout the entire WD-2406R Contract including constructability improvements which helped lower the total cost of change orders during construction. Also, the four addenda from the original WD-2406 contract had to be incorporated into the WD-2406R bid package. Please note that the front end "boiler plate" is different for every PUC contract due to over 70 contract-specific factors and because of ongoing City ordinance/policy changes, new labor agreements, and new environmental requirements.

All the time-consuming activities required for bidding had to be repeated for re-bidding such as re-advertising the contract; re-distributing the contract package to interested contractors; conducting a second pre-bid meeting; conducting a second set of pre-bid site visits and raft tours inside the reservoir for the prospective contractors; answering a second set of contractor questions on bid documents; opening the re-bids; and analyzing the re-bid results.

Comments on PUC's Explanation of Bid and Award Phase Changes, 2007 to 2009

None.

Figure 19. Construction Management Phase, 2007 to 2009

Question on Construction Management Phase:

Why was the December 2007 phase budget $93,000 higher than the 2009 budget?

PUC Response:

This is due to higher than anticipated Construction Management costs.

Comments on PUC's Explanation of Construction Management Phase Changes, 2007 to 2009

We believe that a $93,000 variance on a phase budget of approximately $6.3 million is small (less than 1.5%), and therefore did not pursue additional questions regarding this variance. However, an explanation of why construction management expenses increased compared to the 2007 budget would have made the response more complete.

Figure 20. Construction Phase, 2007 to 2009

Question on Construction Phase:

Why is the 2009 construction phase budget $802,000 lower than the 2007 phase budget?

PUC Response:

This is due to the reduction of anticipated contingency costs (upon completion of Phase B Construction).

Comments on PUC's Explanation of Construction Phase Changes, 2007 to 2009

As noted in the discussion of the changes between the 2005 and 2007 construction phase budgets (Figure 10), the December 2007 construction phase budget included almost $4.2 Million in construction contingency on a base construction amount of approximately $49.2 Million for Phases A and B combined. The explanation that the June 2009 construction phase budget was reduced by $802,000 due to a lower contingency requirement appears reasonable, given that construction was complete by March 2009, so construction contingency funds no longer would have been required at that point.

Analysis of Construction Change Orders

Because the construction phase represents nearly 82 percent of the Sunset Reservoir project's budget, we examined the base construction contracts and associated change orders in detail. Our analysis is summarized in the tables below.

Figure 21. Phase A (Soil Embankment) Construction Contract – Contract Modifications
Contractor: Gordon N. Ball Construction

Phase A Contract Award	$6,799,376
Value of Contract Modifications	$ 614,782
Total Contract Amount	$7,414,158
Value of Changes as % of Award	9.0%
Owner Directed Changes as a % of Award	6.0%
A/E Errors & Omissions as a % of Award	0.9%
Unforeseen /Changed Conditions as a % of Award	2.1%

Why were the changes necessary?

Observation: Contract Modification (CM) # 1 included $24,989.73 in contractor Force Account [6]work (Time & Materials) to accommodate recommendations from the California Division of Safety of Dams for boring correlation to bedrock and alternative compaction methods. The changes were a result of changed subsurface conditions. The unused balances for the contract modification (CM) #1 allowances were used to reduce CM #4. PCO numbers 1, 2, 10, 11, 14 under CM #4 totaled $43,402.22. The $18,775.14 surplus from CM #1 was applied against that total to reduce the CM #4 amount to $24,627.08.

Observation: CM #1 also included $30,000 vibration monitoring allowance for minimizing noise during earthwork activities to accommodate complaints from the neighborhood. The requirement for Vibration Monitoring could have been foreseen and a change eliminated, although there still would have been a cost for noise monitoring had it been included in the bid documents.

Observation: CM #2 included the PUC's decision to eliminate its Owner Controlled Insurance Program (OCIP), under which PUC provided insurance for construction contractors. The change is classified as an Owner Directed Change. As a result of the decision, contractors were required to obtain and pay for their own insurance coverage. The additional cost of contractor-provided insurance was $382,123. If that amount is taken out of the total Phase A change order amount, then the Phase A construction change orders represented only 3.4% of the original award amount.

Observation: CM #3 increased the allowance for the bid item Site Testing and Inspection. This increase was a result of the changed subsurface conditions identified in CM#1. The testing and inspection allowance is used by the designer, so that all bidders use the same testing and inspection cost estimate in their bids, and there is no impact to the bid selection. However, there is often little attention paid to the estimate for the allowance and the result is the need for a contract modification and a draw on the contingency. This had a greater impact on Phase B than Phase A.

Recommendation: For testing and inspection allowances, develop an estimate based on the construction schedule and the likely contractor work plan. This could help reduce change amounts.

[6] In this context, Force Account is defined in the CE Procedure 6.9 as a written directive for extra work to be paid (to the contractor)… when a price cannot be clearly defined or priced in advanced of the work…" The work is performed on a time and materials basis, with daily reports turned into PUC by the contractor.

Observation: CM #4 included $19,500 for survey work. This change was classified a design omission because the specifications were silent on the provisions for the contractor surveying beyond the original scope of service.

Recommendation: Include hourly rates for additional survey crew services in future bidding documents.

Observation: CM #5 included $36,831 for changes classified as design omissions.

Observation: CM #6 adjusted final contract value to the actual cost of unit price items and work accomplished on time and material basis and schedule.

Were proper procedures followed?

Yes. There are two procedures governing contract changes in use at the time of Phase A, Construction Engineering (CE) Procedure 6.9 Rev 0, dated August 11, 2000 and the program change procedure in force at the time of Phase A construction, PM 5.2 Revision 0, dated October 15, 2003. The two procedures work in concert to manage changes. The CE procedure governs the specific contract modification requirements, while the PM procedure ensures that City approvals are acquired and program funding is properly managed.

The contract modification documentation, review, forms and approval levels followed those procedures.

Were changes documented?

The changes were documented in accordance with the procedures. In each case documents are referenced on the signed change modification.

Were changes adequately reported?

Yes. As potential changes were identified, the CM placed the change on the potential change log with an estimated value and description. The logs were included in the project monthly reports and reviewed regularly. Cost exposure was assessed. Significant potential changes (and claims) were carried in the Major Issues/ Potential Obstacles section of the Quarterly Project Status Reports.

The Quarterly Project Status Report includes columns for last and current cost forecast. Since the composite of all potential and approved changes for Phase A were within the budgeted amount for construction, the forecast remained unchanged until Phase B construction was implemented.

Figure 22. Phase B (Seismic Improvements) Construction Contract – Contract Modifications
Contractor: Shimmick Construction

Phase B Contract Award	$41,776,700
Value of Change Orders	$2,337,367,
Total Contract Amount	$44,144,067
Value Change Orders as % of Award	5.6%
Owner Directed Changes as a % of Award	0.8%
A/E Errors & Omissions as a % of Award	0.5%
Unforeseen/Changed Conditions as a % of Award	4.3%

The major changes to the Phase B construction contract are summarized below:

Figure 23. Major Cost Changes to Original Phase B Construction Contract

Increase Testing and Inspection Allowance Pay Item	$850,000
Spall Repair Access & Quantity Overruns	$702,000
Fiberglass Reinforced Polymer Roof Strengthening	$580,000
Total of Major Changes	$2,132,000
Total All Contract Changes	$2,337,367
Balance of Miscellaneous Changes	$ 205,367

The largest cost increase associated with Phase B contract modifications came from changes in "testing and inspection." The testing and inspection contract modifications included cost increases associated with the services provided by a number of subcontractors to the Phase B construction contractor:

Figure 24. Phase B Testing and Inspection Cost Increases

Subcontractor Involved and Description of Additional Tasks/Services	Cost Increase
ISI (Inspection Services, Inc.) - Miscellaneous inspection, spall repair inspection, welding inspection, site welding UT, shop welding UT, welding submittals/misc. correspondence technical review, concrete punch list inspection	$621,100
TMI (Townsend Mgt., Inc.) - Fund 1 office engineer position and a tube steel issue coordinator	$111,800
CPM (Cooper Pugeda Mgt.) - Additional funding for Office Engineer, and misc. inspection support.	$27,700
PSI (Professional Service Industries, Inc.) - Steel fabrication inspection in Texas	$104,900
RES Engineers, Inc. - Sealants inspection	$58,700
Consolidated Engineering Laboratories - Miscellaneous testing and inspection of fiber reinforced polymer application to roof and sidewalls	$65,00

Why were the changes necessary?

Observation: CM #1 included nine changes for a total increase of $418,325. The largest change was for increases to the inspection and testing allowance. This was a result of the increased field activity requiring inspectors beyond what was budgeted when the allowance was estimated.

Recommendation: For testing and inspection allowances, develop an estimate based on construction schedule and the likely contractor work plan. This could help reduce change amounts.

Observation: CM #1 included two changes classified as a design omission. In one case the A/E assumed there would be a surplus of existing stones at the site for the contractor's use. There was not. The second change was for an extension of drilling lengths beyond the values provided in the specifications. The PUC determined that the cost impacts of the omission would have been minimal if the correct information had been included in contract documents.

Observation: CM #2 included 13 changes for a total increase of $737,637. The largest change was for increases to the inspection and testing allowance and the addition of a full time guard service. This accounted for $350,000 of the CM #2 value.

Observation: CM #2 included a settlement of $150,000 for a claimed changed condition involving soffit repair on the reservoir roof. The contractor's position was that he needed to build a scaffold to reach several areas and that many holes were so large they could only be patched using expensive forming. The City argued that the contractor should have foreseen that situation when preparing their bid. The change was negotiated. The City noted on the change "The City did not fully agree with this position, but negotiated the settlement as a proactive means of resolving the issue and avoiding a claim." The CM procedures allow the Project Manager to negotiate a settlement and require a record of negotiations be included in the change documentation. The record of negotiations was included and the procedures were followed.

Other partnering decisions included:

- *PCO #17 (Site Security):* The justification listed in CM #2 reads "…After several incidents of vandalism and theft, SCCI decided to bring a security guard on-site for all week nights and all weekends for one year at an overall cost of $88,400, starting May 11, 2007. As a partnering gesture the City agreed to share 33% of the site security costs for $29,467…" This decision was elevated from the project team to the Regional Project Manager who accepted the proposal.

- *PCO #21 (6" Drain Line):* $9,000 negotiated settlement of requested $13,275 involved review of RFI's, correspondences, contract drawings and contract specifications. PUC indicates that "Settlement in the spirit of partnering was negotiated by Resident Engineer (RE) to provide some compensation to Contractor to cover a portion of the field expenses incurred that were attributable to a conflict between the drawings and specifications." This decision was elevated from the project team to the Regional Project Manager who accepted the proposal.

Observation: CM #3 included 37 changes for a total value $1,144,293. Upon completion of the roof spall repairs the net impact on the contractor for all affected pay items was a large loss. The City negotiated an agreement that paid the contractor $472,857 combining related quantity underruns and overruns and reducing the overruns for work inefficiencies and contractor markup.

Observation: CM #3 included an additional $250,000 for testing and inspection. This was necessary due to increased inspection requirements on the roof and within the reservoir.

Observation: CM #3 included $234,325 classified as Owner Directed changes. These changes were largely a result of security, landscaping and fencing modifications and interactions with the PUC.

Observation: CM #4 included seventeen changes for a value of $102,265. $26,765 of those changes were classified as Owner Directed and $40,000 was for Builders Risk. The remaining balance of $35,500 in changes was due to changed site conditions. The plan in the bid documents to reuse the reservoir float arm and the rim road drainage had to be reevaluated after the renovations were completed.

Observation: CM #5 was the final change for a net credit of $65,154, which conformed the contract amounts of installed quantities and time and material items to the actual amounts ($155,361) and settled the unexpected weather related costs for roof repairs, $83,058 accomplished in winter months and revised $7,149 security door hardware.

Were proper procedures followed?

Yes. There were two procedures governing contract changes in use at the time of Phase B, Construction Engineering (CE) Procedure 6.9 Rev 0, dated August 11, 2000 and the program change procedure in force at the time of Phase B construction PM 5.2 Revision 1, June 13, 2006. The two procedures work in concert to manage change. The CE procedure governs the specific contract modification requirements while the PM procedure ensures that City approvals are acquired and program funding is properly managed.

The contract modification documentation, review, forms and approval levels followed those procedures. The change modification documentation, review, forms and approval levels followed those procedures until Revision 2 was issued September 6, 2008.

Were changes documented?

Most of the Phase B changes were documented in accordance with the procedures. In each case, with the exception of CM #4, backup documents are referenced on the signed contract modification. However, the documentation provided for CM #4 was limited to a list of proposed change orders with a description and cost. The Contract Modification Summary Sheet that had been included in the other approved changes documentation was not included in the CM #4 documents. That summary sheet is valuable, because it provides the reasons for the changes and classifies the reason for the change as Owner Directed, A/E error or omission or changed condition.

Were changes adequately reported?

Yes. As potential changes were identified, the Construction Manager placed the change on the proposed change log with an estimated value and description. The logs were included in the project monthly reports and reviewed regularly. Cost exposure was assessed. Significant proposed changes (and claims) were carried in the Major Issues/ Potential Obstacles section of the Quarterly Project Status Reports.

The WSIP Quarterly Project Status Report includes columns for last and current cost forecast. However, there were no occasions on the quarterly reports that specifically highlighted contract change modifications. This was most likely a result of the changes being drawn from budgeted contingencies and therefore not impacting the construction phase budget.

Figure 25. Close Out Phase, 2007 to 2009

Question on Close Out Phase:

Why has the 2009 budget increased to $533,000 compared to the 2007 phase budget of $325,000?

PUC Response:

The Closeout Phase involves SFPUC resolution of the Phase B stop notices, preparation of the final Phase B payment package, responding to the KPMG annual audit, preparation of the Phase B closeout report, preparation of as-built drawings, handling warranty matters, and electronic archival of project documents. The SFPUC CMB, PMB, EMB, PCSB, and the CAB are involved with charges of actual hours to project index codes. The City Attorney is involved in addressing stop payment matters (now resolved).

The cost variance for the Close Out Phase was due to higher than anticipated Close Out costs. This resulted from a delay in the completion of the Close Out Phase due to Construction time extension for roof micro-cracks and thermal stress modifications, and the ongoing security modifications.

Comments on PUC's Explanation of Close Out Phase Changes, 2007 to 2009

This response provides detail concerning the types of close out issues that arose with Phase B, which drove close out expenses higher between 2007 and 2009. However, the response could have been improved by explaining the background behind the "stop payment matter," what issues were raised in the KPMG annual audit that had to be addressed and why those issues caused project costs to increase, indicating how the 2007 phase budget was developed, and then indicating how the issues surrounding the close out of Phase B altered those budget assumptions.

Overall Findings, Risks and Recommendations Regarding Explanations of Project Budget Changes

Finding IV.1: We found that PUC's explanation of why phase level budget changes occurred could be improved to explain the reasons driving such changes

Because PUC's WSIP Quarterly Reports are intended to serve as high-level, summary documents, the individual quarterly project status reports included in the Quarterly Report provide limited information about how and why budget changes have occurred at the phase level. As a result, PUC project staff developed responses to the consulting team's questions based on their review of the information stored in the Primavera (P6) program control system. Compared to our 2007 audit, PUC was able to provide significantly better information regarding project budget changes that have occurred since 2005 at the phase level. This indicates that PUC has implemented a capital project reporting system that can be used to provide feedback to stakeholders regarding how and why WSIP project budgets and schedules change over time.

However, in several of their responses, PUC focused on how certain budget elements within a phase changed, but did not answer the question of why the change occurred. In addition, in reviewing PUC's responses and the project status information provided to stakeholders through the WSIP Quarterly Reports, we concluded that:

A. Between 2005 and 2009, PUC did not have a consistent methodology for determining which types of project expenses should be included in each project phase, or a standard methodology for estimating contingency levels.

B. PUC's Quarterly Report project cost reporting does not provide information on the movement of costs between phases within a project.

C. PUC's Quarterly Report project cost reporting could be improved to track and report on contingency usage and history.

D. PUC could improve its use of Key Performance Indicators to identify for stakeholders how a project is progressing, and whether the project faces budget and/or schedule pressure.

Risk IV.1- PUC's Explanation of Why Phase Level Budget Changes Occurred Could Be Improved

PUC risks harming its credibility with stakeholders if it is unable to provide complete explanations of why the budgets for WSIP projects have changed over time. PUC also risks harming its efforts to improve transparency and accountability if the project performance indicators that are presented to stakeholders and the public do not clearly convey whether a project is facing budget, scope or schedule risk. Unless KPI are an established data set, there also is a risk of focusing staff on less important issues that may arise during the course of a project.

Recommendation IV.1- PUC's Explanation of Why Phase Level Budget Changes Occurred Could Be Improved

We have provided comments on specific PUC's responses, which highlight the areas where PUC could improve its explanations of why budget changes at the phase-level were necessary from 2005 to 2007, or from 2007 to 2009. PUC can use these comments as guidance in developing more complete responses to future RBOC project audits, and project audits by other interested parties. In addition, we recommend that:

A. PUC should settle upon a project budget methodology and stick with it.

B. As a general matter, PUC's WSIP budget reporting should include the capability to track, at the phase level, each project's original 2005 baseline budget, changes to the budget that occur over time, and current budget, along with narrative concerning the reasons why each budget change was executed. This information should be catalogued and provided an as appendix the WSIP program budget.

C. Although there legitimate reasons why PUC may wish to limit access to information about project contingency usage, it is important for key stakeholders to have access to this data.

D. We recommend that PUC also report on the following "Key Performance Indicators" that would provide stakeholders with a better sense of whether a project is facing budget or schedule pressure. Sample Key Performance Indicators include:

Figure 26. Proposed WSIP Project Key Performance Indicators for Construction Phase

Key Performance Measure	Area Measured
% Change Order Value/Original Contract Value	Variance from contracted (base) scope of work
# Activities On Critical Path/Total Number Of Activities	Ability to complete project on time/project criticality
% Of $ Expended/% Of Time Expended	Ability to place work within contracted time parameters (throughput)
% Of Contingency Used/% Of Time Used	Rate of contingency use given contracted time

Finding IV.2- We found that the WSIP Quarterly Report does not provide information on the source of project funding increases or phase budget increases.

Based on our review of WSIP Quarterly Reports, it is not possible to directly trace how savings from one project were applied to another project. PUC staff informed us that the increase in the project budget from 2005 to 2007 was funded from savings from the other San Francisco Regional project,

the University Mound – North Reservoir.[7] As we have noted in a prior RBOC audit, with certain exceptions, the Board of Supervisors has granted PUC the flexibility to transfer appropriations within regions without additional approval.

Risk IV.2- Quarterly Report Does Not Identify Source of Project Funding Increases or Phase Budget Increases

If all budget transfers between projects are not explicitly reported to stakeholders and the general public, the PUC may be perceived as attempting to hide information about its management of the WSIP program's finances. This could harm the agency's overall efforts to improve transparency and to demonstrate its accountability.

Recommendation IV.2- Quarterly Report Does Not Identify Source of Project Funding Increases or Phase Budget Increases

While it makes sense for PUC to have certain flexibility to transfer appropriated funds from one project to another within regions, these types of budget transfers should be catalogued and documented in PUC's primary report to stakeholders and the general public, the WSIP Quarterly Report. This becomes increasingly important for capital improvement programs that transition from a single fund source to multiple funding sources: comingling of fund sources with potentially different eligibilities poses a significant risk that could be exacerbated by not identifying sources and uses of budget transfers.

Finding IV.3 – Current program management system (P6) is not configured to track program funding, as it is designed to handle scheduling, cost reporting and technical processes associated with design and construction.

Primavera, the program management tracking system, is designed for tracking standard engineering and construction processes, scheduling and for cost reporting, but it is not designed to track program funding. The WSIP currently relies almost exclusively on Proposition A bond funds as its funding source. However, in the future, if the WSIP obtains additional voter approval for a new series of revenue bond issues, or receives funding from federal or state sources, each of which may have different conditions for their use, PUC may need the ability to use its program management system to

[7] As context for this change in the Sunset Reservoir's project's budget, between November 2005 and December 2007:

- The budget for the San Francisco Region, which then included the Sunset Reservoir and University Mound Reservoir WSIP projects, decreased from $164,859,000 to $138,226,000, due to a $30,580,000 reduction in the budget of the University Mound Reservoir project;
- The budget for the total WSIP Regional Program increased by approximately $139 million from $3,407,351,000 to $3,546,506,000;
- From November 2005 to December 2007, the budget for the overall WSIP Program, including the Regional Program, the Local program and financing costs, increased by approximately $49.2 million from $4,342,972,000 to $4,392,124,828.

track multiple funding sources. The alignment of funding and scope is a critical program management oversight function.

Risk IV.3 – Program Funding Not Tracked Or Reported

Revenue bond programs, and federal and state grant funds, often have scope, expenditure and time limitations attached to the funds. Tracking only the cost, schedule and scope of a project can overlook specific limitations of each funding source that might affect the way project funds are spent.

Recommendation IV.3 – Program Funding Not Tracked Or Reported

In the future, the WSIP Quarterly Report format may need to be revised to include a section on fund status.

Did Sunset Reservoir Change Orders Comply with PUC Policies and Procedures?

Finding IV.4- We found that project changes complied with PUC Policies and Procedures

We reviewed the Contract Modifications that were executed for the Phase A and Phase B construction contracts, as well as PUC's Construction Management and Project Management policies and procedures. We found that the Change Control procedures and approval levels are reasonable for the management of a large capital program. We also found that in general, the Sunset Reservoir-North Basin project complied with PUC's policies and procedures.

Risks IV.4- Project changes complied with PUC Policies and Procedures

Not applicable.

Recommendations IV.4- Project changes complied with PUC Policies and Procedures

Not applicable.

Finding IV.5 – We found that a change order for work that was potentially not warranted was negotiated and approved to avoid possible downstream issues with the contractor.

There were certain instances where the PUC's Construction Management staff did not believe that a proposed change order was warranted, but approved it "in the interests of partnering," or "in order to avoid a claim," even though these are not specifically identified as reasons for change orders in PUC's procedures. In Construction Engineering Procedure 6.9, the Resident Engineer has the authority to negotiate a settlement to a change "depending on the reasonableness of the contractor's proposal." In this case, partnering or claims avoidance is considered a negotiation result. PUC does have a partnering process, a dispute resolution board, as well as an authority matrix for escalating potential claims up the management chain of command within a prescribed time period for Phase B.

PUC staff states that "the Contractor raised issues that were questionably justified per a strict interpretation of the Specifications, but were perhaps not without some merit given the extenuating

circumstances. These issues were referred to upper management for review and consideration, and in each instance compromise settlements were reached that both parties could live with."

Risks IV.5– Changes "In Interest of Partnering"

The risk associated with approving questionable changes in order to avoid claims is that knowledge of this practice may give contractors an incentive to pursue claims that should be denied, since the agency may be more inclined to approve borderline claims rather than contest them. This risk must be balanced against the risk associated with denying all questionable claims, and potentially incurring higher legal costs. This practice also may be viewed as setting a precedent to other contractors on other WSIP projects with reason to submit such requests for change orders.

Recommendations IV.5– Changes "In Interest of Partnering"

PUC has recently adopted new procedures that include formal partnering (Construction Management procedure P 24) and dispute resolution (Construction Management procedure P19) protocols This approach provides a structured framework for discussing and evaluating questionable claims. As it implements these new procedures, PUC should ensure that it explicitly evaluates the costs and benefits associated with any claims avoidance actions, and documents its actions.

Review of Project Expenditures

Vouching Of Invoices

In vouching the documentation supporting the various contractors' claims, the consulting team reviewed 32 invoices totaling $21.8 million. This represents almost half of the dollars claimed during the period from FY2006/07 through FY2008/09. More specific information is provided in the table that follows.

Figure 27. Sunset Reservoir – North Basin Invoice Recap

Fiscal Year	Total Non-Personal Service Costs Invoiced (1) (Excluding Overhead)	No. Of Invoices Reviewed	Aggregate Dollar Value of Invoices Reviewed	Percentage Of Total Reviewed
2006-2007	**$17,726,899**	**11**	**$6,387,723**	**36%**
2007-2008	**$25,524,593**	**9**	**$13,111,191**	**51%**
2008-2009	**$3,591,728**	**12**	**$ 2,261,529**	**63%**
TOTALS	**$46,843,220**	**32**	**$21,760,443**	**46%**

(1) Appropriations under $10,000 were excluded.

Finding IV.6 – We found that payments were adequately documented.

In reviewing the contract payment and other invoices, we determined that all payments had the proper "encumbrance" documents in place to allow payment, and that the payments themselves were:

- For the appropriate time period;
- For the proper amount;
- Made to the correct vendor;
- Charged to the correct project; and
- For the appropriate goods and services.

We also noted that there is an extensive approval process in place:

- All submissions for contractor payment are reviewed and approved by the Project Manager, Contract Manager and a Resident Engineer;

- Once approved, the request is forwarded to Contract Administration, which reviews the invoice for compliance with contract provisions; and then

- The invoice is sent to Finance. If all is in order from a fiscal perspective, the invoice is approved for payment by PUC and sent on to the Controller for their review and ultimately payment to the Contractor.

A binder is maintained with all allowable signatories broken down by PUC Bureaus. The binder is maintained in PUC's Financial Services Office and is updated on a regular basis. Information regarding who within the PUC is authorized to approve various types of invoices of varying dollar thresholds is readily available and easily understood.

Risks IV.6- Payments Are Properly Documented

Not applicable.

Recommendations IV.6 - Payments Are Properly Documented

Not applicable.

Finding IV.7 – We found that PUC is streamlining invoice processing through the use of a computerized invoice processing system

During the course of the 2009 review, it became readily apparent that the paperwork to be reviewed has been radically reduced, when compared to our prior reviews in 2006 and 2007. The PUC has introduced a new software application called "Hummingbird," which allows documents to be viewed on-line. PUC is moving forward with the computerization of the invoicing process. This transition process began in January 2008. Finance now copies only the germane payment documents for filing: The approved contractor billing; Contract Administration's signed transmittal letter authorizing Fiscal

to pay the invoice; and Fiscal's request to the Controller's Office for payment are now contained in the paper file. All the Human Rights compliance forms, Contract Administration checklists, and other contract documentation are still available, but can only be viewed on-line. Under the old manual system, approximately 25 pieces of paper supported each claim for payment. This has been reduced by approximately two-thirds. This system should prove to be more efficient and effective in paying contractors in a more timely fashion.

Risk IV.7 – Streamlining Invoice Processing

To the extent that the invoice review and payment process gets bogged down at any one of the approval points, PUC risks incurring any interest expenses associated with late payment. In addition to the financial cost associated with not making timely payments, if PUC gains a reputation within the contracting community for untimely payments, this could result in somewhat higher cost proposals on future contracts, as contractors compensate for their higher anticipated financing costs.

Recommendation IV.7 - Streamlining Invoice Processing

While we are heartened that one major recommendation of computerizing the vouching system has been implemented, we believe still more attention needs be given this area with an eye toward further streamlining the payment approval process. There is still a minimum of six approvals necessary before a payment voucher can be issued. This would benefit the WSIP program by facilitating the prompt payment of contractor invoices, as the volume of WSIP construction activity increases over time.

Appropriation Analysis

Finding IV.8- We found that all project appropriations could be traced back to their source, but that the allocation of program management costs to WSIP projects is not occurring on a regular basis.

The appropriation amounts reflected in FAMIS as of June 30, 2009 (pre-closing) were traced back to the authorizations of the Board of Supervisors. We then accounted for the pre-CIP funding, a revenue transfer and an allocation of program management costs to balance to the total FAMIS appropriation.

The following table identifies the appropriations approved by the Board of Supervisors for the Sunset Reservoir project to date.

Figure 28. Sunset Reservoir – North Basin Incremental Project Budget Appropriations Approved by Board of Supervisors Since 2003

JUNE 2003	JULY 2004	AUG 2005	MAY 2006	FEB 2007	APRIL 2008	JAN 2009	TOTAL APPRVD BD OF SUPS.
$2,038,000	$4,415,000	$24,389,000	$22,117,794	$3,781,100	$6,596,089	$140,089	$63,477,072

In addition to the amounts directly appropriated by the Board of Supervisors for the Sunset Reservoir project, the following table identifies the additional revenue components included in the project's total appropriation to date, including transfers from other appropriations. The explanations for each of these transfers are presented below the table.

Figure 29. Total Amounts Appropriated to Sunset Reservoir Project Including Transfers

Total Approved **Board Of Supervisors**	**Pre-CIP Revenues**	**Budget Transfer within San Francisco Region**	**Project Management Allocation**	**Total FAMIS Appropriations**
$63,477,072 (1)	**$**1,595,857 (2)	**$**850,000 (3)	**$**1,866,857 (4)	**$**67,789,785

(1) **Board Appropriations**: The request for bond fund expenditure authority is derived from a "ground-up" budget ultimately approved by the PUC. The PUC financial budget unit then requests appropriation approval at the program level. A work sheet is then prepared breaking these dollars into specific projects which are reflected in FAMIS.

(2) **Pre-CIP Funding**: As discussed in greater detail in our 2006 Report, the so-called "Pre-CIP funds" serve as a revenue source for WSIP projects in addition to the Proposition A bond funds. Approximately $19.7 million in Pre-CIP funds were derived from the sale of property in Pleasanton ($9.8 million), as well as from the proceeds of pre-Proposition A bonds. Specifically, this includes $2.2 million from the 1996A bonds and approximately $7.7 million from the 1998A bonds.

(3) **Budget Transfer Within San Francisco Region**: The budget transfer we encountered reflected a shift in funding determined by the financial need of the various projects within the same funding allocation, from one San Francisco Regional project to another. In this instance, $850,000 was transferred from the University Mound Reservoir Upgrade to the Sunset Reservoir project in October 2006.

(4) **Program Management Cost Allocation**: In June 2008, approximately $25 million of accumulated WSIP program management costs were allocated to each WSIP project from a master account based on a pro-rata share of each project's accumulated costs at the time of the distribution. These are program management costs that could not be specifically attributed to any one project. The amount allocated to Sunset Reservoir was $1,866,857.

Based on total project costs, at that time, the Sunset Reservoir project's costs were 1.85% of the total accumulated costs for the all WSIP regional and local projects. PUC derived the Sunset Reservoir-North Basin's program management cost allocation by multiplying 1.85% x $25.12 million in aggregate WSIP program management costs x a 93% project completion factor to arrive at the amount allocated.

The balance of the program management costs will be allocated at some future unspecified date. This new procedure is the result of an audit finding. The allocation of these accumulated costs allows the costs to be capitalized and incorporated into the PUC's rates at the conclusion of each project, rather than at the completion of the WSIP in its entirety. PUC staff expected an annual allocation of WSIP program management to occur in June 2009, but it did not.

Risks IV.8- Appropriations

Program Management costs associated with WSIP projects are allocated costs, rather than direct expenses. Without a transparent allocation methodology and schedule for future allocations of these expenses, there may be a potential for cost allocations to be manipulated to keep certain projects from appearing to be over-budget by allocating less than the "appropriate" share of project management expenses to them.

Recommendation IV.8 - Appropriations

The allocation of program management costs to the projects requires increased standardization. A firm schedule for the ongoing allocation of these costs to projects does not appear to be in place. The protocol for determining when program management costs should be allocated, and to which projects, needs be more clearly defined.

Primavera/FAMIS Reconciliation

Finding IV.9 – We found that the Primavera/FAMIS Reconciliation should be improved by standardizing the treatment of program management costs

Before undertaking discussion of the FAMIS/Primavera reconciliation, it is important to understand that the two systems are utilized to meet different needs. FAMIS, which is the City's online accounting system, is a straight-forward accounting system used by all City departments. For each project, it reveals how much funding is currently available, how much has been expended, and what the funding was spent for. In contrast, Primavera (now known as P6) is a management tool, which allows monitoring of completion targets in relation to dollars spent and time consumed. Because of the timing issues involved with using a June 30th cut-off date[8], we compared data from FAMIS and P6 as of the end of July 2009. The reconciliation below indicates that the difference between the two systems was less than one-tenth of one percent.

Primavera Expense July 31, 2009		$63,763,609
Add: Program Management costs not included in P6	$1,866,857	
Less: Accruals not in FAMIS	($30,422)	$1,836,435

[8] Because of timing issues, an accurate audit of the expenditure reconciliation of Primavera (P6) to FAMIS as of June 30, 2009 was not possible. Because of the fiscal year-end closing, in FAMIS the month of June 2009 did not close until the end of August. Primavera used June 2009 data that was downloaded from FAMIS on July 13th. It was impossible to get a snap-shot of FAMIS as of July 13th to compare against because once a date has passed in FAMIS, and more expenditure data is loaded into the system, data regarding the status of FAMIS on earlier dates cannot be retrieved

Adjusted Primavera Expense	$65,600,044
FAMIS Expense July 31, 2009	$65,610,044
Difference	$10,000
% Difference	0.015%

A larger accounting issue is the handling of the program management allocation ($1,866,857) by Primavera. In FAMIS, both the budget and expense were moved into the Sunset Reservoir project. Primavera has chosen to filter out this transaction and leave the allocation in the master account.

Risk IV.9 – Primavera/FAMIS Reconciliation

Unless, this methodology is changed, these program management cost allocations will be reconciling items for the life of the project between the two systems. The two systems will never truly align. The projects total costs would never be displayed in Primavera.

Recommendations IV.9 - Primavera/FAMIS Reconciliation

- The methodology for the distribution of program management costs should be changed in Primavera to mirror the treatment of those costs in FAMIS, so that all costs allocated to each project are shown in that project in Primavera.

- As noted above, excluding the difference in the treatment of program management costs, the differences in the data found in P6 and FAMIS are relatively small. Nonetheless, the PUC should emphasize taking corrective action of reconciling items. This issue was raised in the RBOC's 2007 Report. In that Report, we had recommended that: "An individual staff person within the PUC Program Controls and Support Bureau should be made responsible and accountable for correcting the reconciling errors as quickly as possible. The longer that reconciling entries languish and accumulate, the harder it becomes to bring two systems back into balance. Eventually this could harm the credibility of the expense data presented in P3E. In follow up discussions, PUC staff has indicated that it believes it is reconciling P3E to FAMIS, without necessarily identifying the source of each discrepancy."

V. Review of PUC and Controller's Office Policies & Procedures

> **Task 3:** With respect to completed Tasks 1 & 2, review how the Commission policies complement those set forth under the Office of the City Controller. Consultant to review and assess how the Commission's internal practices complement those set forth by the Office of the City Controller or require modification in order to become compliant. Consultant to review and evaluate SFPUC practices against standard industry practices associated with public infrastructure projects of a similar scope.

Background on Compliance with Controller's Policies and Procedures

The City's 1996 Charter Section 3.105 designates the Controller as the Chief Accounting Officer and Auditor for the City. The Controller is responsible for all financial management systems, procedures, internal control processes and reports that disclose the fiscal condition of the City to managers, policy makers and citizens. The Controller is also the auditor for the City and County performing financial and performance audits of departments, agencies, concessions and contracts. In furtherance of these charter-mandated functions, the Controller's Office provides a variety of support services. These include processing the City's budget, developing and maintaining a financial accounting system for use by all departments, and preparing and distributing paychecks for all City employees.

We used the Controller's responsibilities identified in the City Charter as a guideline for discussions regarding compliance and hindrances pertaining to the applicable policies and procedures of both the PUC and Controller's Office. Specific attention was paid to the areas covered in this engagement. The key questions that we focused on were:

- Were there control deficiencies in any area?
- Could compliance in any areas be made less burdensome by the Controller?

We interviewed five members of the Controller's staff from the Accounting Operations and Systems Division, along with two senior finance staff from PUC who previously worked for the Controller's Office. From those interviews, we were able to cull the following information.

The PUC tailors all of its policies and procedures to conform to the Controller's mandated regulatory oversight. We reviewed the PUC's Accounting Guidelines. These "how to" guidelines were written in accordance with the City Charter, the Administrative Code and the policies and procedures of the Controller's office. Some of the policies covered that seemed the most relevant are:

- Capital Projects
- Interdepartmental Work Orders
- Payment Processing
- Transaction Approvals/Authorized Signatures
- Purchasing
- Vendors
- Expenditure Budget Surplus Transfer
- FAMIS or ADPICS Training
- Index Codes

Adhering to these guidelines will:

- Facilitate the timely processing of payment requests;
- Prevent rejection of payment requests by the Controller's office; and
- Minimize the number of transactions listed as "exceptions" in the Controllers annual post audit of the department.

In an effort to determine the degree of adherence to these policies and procedures, the Controller's post-audit for calendar year 2008 dated July 6, 2009 was reviewed. For the PUC Water Division, the audit noted two issues that were labeled "high priority." In one instance, a payment of $13,334 was made for services provided before the issuance of a purchase order. A further review revealed there were no WSIP funds involved. The payment was traced back to a general fund operating account for a one-time payment to West Coast Aggregates. The second finding was that a payment in the amount of $152 was not processed within the discount period, resulting in loss of the discount. In both these instances, the PUC's Accounting Services Manager agreed and promised to continue to train and monitor staff regarding accounting policies and procedures. From these findings, it is evident that the PUC is aware of the Controller's policies and procedures, and is complies with them with few exceptions.

Everyone interviewed agreed that the Controller's oversight was a positive experience. From the Controller's perspective, the oversight is simply their responsibility. They cited City Charter Section 3.105 which:

- Establishes the Controller as the City Services Auditor for the City and County;
- Gives the Controller the authority to audit the accounts and operations of all boards, commissions, officers, and departments; and
- Grants access and authority to examine all boards', commissions', officers', and departments' documents, records, books, and other property.

In addition, Proposition C, which was adopted by the voters in November 2003, established Appendix F in the City Charter and created the City Services Auditor within the Controller's Office. It combined the existing Audits, City Projects, and Performance Management functions of the Controller's Office into one division and expanded the division's roles and responsibilities. Under the City Charter Appendix F, the City Services Auditor has broad authority for:

- Reporting on the level and effectiveness of San Francisco's public services and benchmarking the City to other public agencies and jurisdictions;
- Conducting financial and performance audits of City departments, contractors, and functions to assess efficiency and effectiveness of processes and services;
- Maintaining a whistleblower complaints hotline and website, and investigating reports of waste, fraud and abuse of City resources; and
- Ensuring the financial integrity and improving the overall performance and efficiency of City government.

Finding V.1 – We found that the Controller and PUC should continue to streamlining contractor payment processing

In August of 2007, the Mayor issued an Executive Directive on "Payment Policies for Construction Contracts," which requires all Departments to make every effort to pay vendors within fifteen (15) business days after receipt of an undisputed invoice for work performed. On November 7, 2007, the Controller issued guidance to Departments to serve as a roadmap for the Prompt Payment Program. This guidance also set up a program through Bank of America that made electronic payments to contractors possible thus cutting down on time and paperwork. These guidelines were issued under the Controller's authority:

1. As City Services Auditor through San Francisco Charter, Appendix F;
2. In San Francisco Charter, Article I, Sec. 2A.20; and
3. In San Francisco Administrative Code Chapters 14B and 21.03.

Also, in December 2008, the Controller instituted a policy that delegated authority for certain accounting transactions to certain low-risk City Departments. It is believed this delegation of high volume, low risk transactions will be much more efficient in allowing Controller's staff to devote more time to the review and analysis of larger volume, more complex transactions.
At the time this policy was rolled out, a decision was made that the new policy would not apply to the PUC. This was not because PUC was deemed to be higher risk, but solely because PUC already funds a position on the Controller's staff that is dedicated to reviewing and processing PUC payment transactions. It was determined there was no need to reduce the work load of that employee. However, as the rate of spending on the WSIP increases, PUC staff believes that delegating low risk accounting transactions to PUC could help address pending concerns about the prompt processing of a larger number of payments in the future.

While strictly a manpower deployment issue from the perspective of the PUC, this workload shift would impact the WSIP by freeing up the Controller's staff to review the larger, more complex transactions. With the smaller, more mundane transactions reviewed by PUC staff, the larger transactions, the preponderance of which are anticipated to be WSIP transactions, would undergo a more extensive review by Controller's staff.

In addition, PUC reports that it is taking additional steps to prepare for the increase in WSIP-related accounting transactions. PUC has created a new Assurance and Internal Controls (AIC) Department to provide advisory, assurance and risk management support across the PUC in areas of internal audit,

risk management, assurance reviews, business process improvement, and claims and litigation. PUC staff indicated that recent undertakings include the implementation of a new Enterprise Risk Management framework across the PUC, development of an enterprise-wide Fraud Awareness and Prevention training program, and multiple assurance reviews and advisory projects within the Financial Services Bureau. The AIC department intends to work closely with PUC management, the Controller's Office and other City departments, where applicable.

Risks V.1 - Streamlining Contractor Payment Processing

As noted in Finding IV.6, to the extent that the invoice review and payment process gets bogged down at any one of the approval points, including between the PUC and the Controller's Office, PUC could gain a reputation within the contracting community for untimely payments, this could result in somewhat higher cost proposals on future contracts, as contractors compensate for their higher anticipated financing costs.

Recommendation V.1 - Streamlining Contractor Payment Processing

The Controller should delegate authority to the PUC for transaction review granted other low-risk departments. This would assist PUC Finance in managing their anticipated increased workload from WSIP transactions. That, in turn, would benefit the WSIP program by reducing the chances that the payment of complex invoices could be delayed by a lack of timely review at either the Controller's Office or PUC Finance.

Finding V.2 - We found that the accounting for bond proceeds requires ongoing management attention

Our discussions with PUC staff centered more on the cooperation that PUC receives from the Controller. A case in point is ensuring the appropriate accounting for bond proceeds is implemented, consistent with bond indenture requirements and IRS regulations. Of the approximately $4.6 billion WSIP program budget, PUC anticipates a quarterly spending requirement of up to approximately $400 million. PUC staff explained how hundreds of millions of dollars in interest expenses are being avoided for ratepayers by selling bonds only when the proceeds are needed for expenditure encumbrance and actual spending, instead of financing the entire WSIP program up-front at the outset of budget adoption or appropriation.

The accounting for bond proceeds involves setting up and tracking four categories of records (Commission Program Adopted Budget, Board-approved Appropriation Budget, encumbrance and actual spending) across each series of bond proceeds. Both departments agree that this is a time-consuming process, but that the interest expense savings justify the effort. PUC has indicated that while FAMIS can meet the reporting needs for the bond program, it is not a flexible system, and that the process they must use is cumbersome, and can be challenging to implement properly. Each bond issue must be given a separate index code, Finance must disseminate those index codes to WSIP project staff, and project staff must be diligent in charging expenses to the correct index code(s). Both departments continue to work on the improving the methodology for handling this matter and also agree that non-compliance in any area for any reason is not an option.

Risk V.2 – Accounting for Bond Proceeds

The PUC is well aware of the risks associated with improperly accounting for the use of tax-exempt bond proceeds. These risks can range from damage to PUC's reputation with the debt investor community, which could affect the interest rates associated with future PUC debt issues, to a determination by the IRS that the interest on a particular tax-exempt bond issue should be treated as taxable, due to tax law violations. In addition to the reputational risk associated with an IRS action, the latter risk would subject the PUC to legal action by bondholders seeking compensation for the loss of federal tax-exemption for their interest payments.

Recommendation V.2 – Accounting for Bond Proceeds

The PUC and Controller's Office should continue to pursue ways that they can meet the reporting needs for the tracking of bond proceeds.

PUC Policies and Procedures Compared to Industry Practices

The Sunset Reservoir - North Basin project has spanned several years with Project Planning beginning in March 2000. As such, policies, procedures and management practices for the PUC and WSIP have undergone revisions since then. In 2000 Clean Water Projects were governed by the Project Operations Manual, a set of procedures covering development of CIP Projects from Concept to Closeout. A Program and Project Management Procedures manual compliments the Operations Manual, and describes the management of the WSIP Program. The earliest PM procedure reviewed was dated October 15, 2003 and revised on September 6, 2008. Another set of PUC procedures is displayed on the WSIP website, which cover Construction Management. Those procedures are being implemented on new projects as they enter the construction phase.

The procedures that we reviewed are listed in the table below.

Figure 30. PUC Procedures Reviewed

	Project Operations Manual		
1.0	Capital Improvement Planning	Introduction	R0 8/11/00
2.0	Project Initiation	Introduction	R0 8/11/00
3.0	Conceptual Phase Engineering	Introduction	R0 8/11/00
3.3	Conceptual Phase Engineering	Prepare Design Criteria	R0 8/11/00
4.0	Detail Design	Introduction	R0 8/11/00
4.1	Detail Design	Prepare Design Package	R0 8/11/00
4.4	Detail Design	Constructability Review	R0 8/11/00
5.0	Contracting Phase	Introduction	R0 8/11/00
5.1	Contracting Phase	Construction Contracts	R0 8/11/00
5.2	Contracting Phase	Owner Furnished Material	R0 8/11/00
6.0	Construction Engineering	Introduction	R0 8/11/00
6.1	Construction Engineering	Contract Initiation	R0 8/11/00

6.2	Construction Engineering	Engineering Support of Construction	R0 8/11/00
6.3	Construction Engineering		R0 8/11/00
6.4	Construction Engineering	Test & Startup	R0 8/11/00
6.5	Construction Engineering	Substantial Completion	R0 8/11/00
6.6	Construction Engineering	Progress Payments	R0 8/11/00
6.7	Construction Engineering	Management of Submittals	R0 8/11/00
6.8	Construction Engineering	Client Training	R0 8/11/00
6.9	Construction Engineering	Contract Modifications	R0 8/11/00
6.10	Construction Engineering	Potential Claim Admin	R0 8/11/00
6.11	Construction Engineering	MBE/WBE Participation	R0 8/11/00
7.0	Project Closeout	Introduction	R0 8/11/00
7.1	Project Closeout	Turnover	R0 8/11/00
7.2	Project Closeout	Contract Acceptance	R0 8/11/00
8.0	Project Controls	Introduction	R0 8/11/00
8.1	Project Controls	Project Initiation	R0 8/11/00
8.2	Project Controls	Milestone Reports	R0 8/11/00
8.3	Project Controls	Project Status Reports	R0 8/11/00
8.4	Project Controls	Phase Summary Bar Chart	R0 8/11/00
8.5	Project Controls	Labor Charge Reports	R0 8/11/00
8.6	Project Controls	Project Work Plan	R0 8/11/00
9.0	Consultant Management	Introduction	R0 8/11/00
9.1	Consultant Management	Consultant Selection	R0 8/11/00
9.2	Consultant Management	Agreement & Negotiations	R0 8/11/00
9.3	Consultant Management	Agreement Administration	R0 8/11/00
9.4	Consultant Management	Agreement Amendments	R0 8/11/00
9.5	Consultant Management	Specialized Consultants	R0 8/11/00
	Program & Project Management		
2.1	Project Development Process		R1 1/26/05
2.1	Project Development Checklists	For Each Phase	
2.2	Project Management Plan		R2 3/28/08
5.2	Project Controls	Change Management	R2 9/06/08
6.2	Quality Assurance	QA Plan	R1 2/16/07
	Construction Management		
P01		Preparation of WSIP Procedures	R0 2/04/09
P02		Requests for Information	R1 09/09/09
P03		Value Engineering Changes	R0 02/24/09
P04		Submittals	R1 08/07/09
P09		Non Compliance Notices	R0 03/26/09
P10		Application for Payment	R1 08/17/09
P12		Safety Reporting	R2 08/06/09
P13		Construction Claims Management	R0 03/31/09

P15		Schedule Management	R1 08/14/09
P16		Change Management	R2 10/21/09
P19		Dispute Review Board	R1 08/25/09
P20		Construction Progress Reports	R1 08/25/09
P24		Formal Partnering	R0 2/16/09
P31		Dispute Resolution Advisor	R1 08/25/09
P32		Contract Close Out	R1 08/26/09
P36		Admin of Force Accounts	R0 08/11/09
1.0	Capital Improvement Planning	Introduction	R0 8/11/00
2.0	Project Initiation	Introduction	R0 8/11/00
3.0	Conceptual Phase Engineering	Introduction	R0 8/11/00
3.3	Conceptual Phase Engineering	Prepare Design Criteria	R0 8/11/00
4.0	Detail Design	Introduction	R0 8/11/00
4.1	Detail Design	Prepare Design Package	R0 8/11/00
4.4	Detail Design	Constructability Review	R0 8/11/00
5.0	Contracting Phase	Introduction	R0 8/11/00
5.1	Contracting Phase	Construction Contracts	R0 8/11/00
5.2	Contracting Phase	Owner Furnished Material	R0 8/11/00
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6.3	Construction Engineering		R0 8/11/00
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6.10	Construction Engineering	Potential Claim Admin	R0 8/11/00
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7.2	Project Closeout	Contract Acceptance	R0 8/11/00
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8.3	Project Controls	Project Status Reports	R0 8/11/00
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9.2	Consultant Management	Agreement & Negotiations	R0 8/11/00
9.3	Consultant Management	Agreement Administration	R0 8/11/00
9.4	Consultant Management	Agreement Amendments	R0 8/11/00
9.5	Consultant Management	Specialized Consultants	R0 8/11/00
	Program & Project Management		
2.1	Project Development Process		R1 1/26/05
2.1	Project Development Checklists	For Each Phase	
2.2	Project Management Plan		R2 3/28/08
5.2	Project Controls	Change Management	R2 9/06/08
6.2	Quality Assurance	QA Plan	R1 2/16/07
	Construction Management		
P01		Preparation of WSIP Procedures	R0 2/04/09
P02		Requests for Information	R1 09/09/09
P03		Value Engineering Changes	R0 02/24/09
P04		Submittals	R1 08/07/09
P09		Non Compliance Notices	R0 03/26/09
P10		Application for Payment	R1 08/17/09
P12		Safety Reporting	R2 08/06/09
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P15		Schedule Management	R1 08/14/09
P16		Change Management	R2 10/21/09
P19		Dispute Review Board	R1 08/25/09
P20		Construction Progress Reports	R1 08/25/09
P24		Formal Partnering	R0 2/16/09
P31		Dispute Resolution Advisor	R1 08/25/09
P32		Contract Close Out	R1 08/26/09
P36		Admin of Force Accounts	R0 08/11/09

Finding V.3- We found that PUC Construction Management and Project Management Procedures comply with Controller's policies and are consistent with leading industry practices

PUC procedures for Construction Engineering, Construction Management and Project Management have been reviewed. In general, PUC's procedures are in compliance with the Office of the City Controller's policies. The CM procedures that are posted on the WSIP website have recently been updated and are largely consistent with industry leading practices.

Risks V.3 – Construction Management And Project Management Procedures

Not applicable.

Recommendations V.3 – Construction Management And Project Management Procedures

Below, we offer several observations and recommendations regarding PUC's procedures that may be considered for future revisions.

Construction Engineering Procedures

CE4.1 - Detail Design Prepare Design Package

- Procedure: Establishes method for developing construction documents by the design team.
  Observation: The Procedure infers that design will be accomplished by in house (City) engineering.
  Recommendation: Include a criteria and method for determining if work is to be accomplished with City forces or if a Design Consultant will be used for the project. Procedure 9.1 pertains to Consultant Selection. It may be useful to point the reader to that procedure in this procedure.

CE6.2 – Engineering Support of Construction

- Procedure: Details scope of project engineering during construction.
  Observation: procedure is a good list of services for engineering support of field staff, however, there is no discussion on support of Owner Directed and Scope Changes implemented after construction begins. This is generally a source for additional, unplanned work after contracts documents are completed.
  Recommendation: Consider revising this procedure or adding a reference that points to the scope change preparation section.

CE6.4- Test & Startup

- Procedure: The procedure informs the field engineering staff on preparations for equipment training, testing and startup.
  Observation: There is no mention of scheduling participants and inspectors from outside agencies. With agency budget and staffing cutbacks several months lead time is needed for some of the required certifications. Unless a field engineer has experience with state and local inspectors, they may assume that the inspectors are available on short notice and then experience a delay while waiting for their inspections.
  Recommendation: Include a statement about allowing sufficient lead time for these critical inspections.

CE6.5 – Substantial Completion

- Procedure: Lays out requirements for preparing and disposing of punch lists and getting the contract to substantial completion.
  Observation: On many properties and capital improvements Substantial Completion also implies Beneficial Occupancy. If work is not totally completed, the client may need a

Temporary Occupancy Certificate by the permitting agency in order to use the facility. However, the PUC facilities are exempt from City building permits and occupancy certificates are not required. On PUC projects, Substantial Completion is associated with beneficial occupancy.
Recommendation: None.

Construction Management Procedures

P010- Application for Payment

This procedure is the guideline for SFPUC CM staff to process contractors' pay applications.

- Procedure: Construction Pay applications are a result of a cost loaded schedule.
  Observation: While this is a solid practice for managing a project and assessing progress, it is often difficult for SBE contractors on small contracts to comply with the requirement. They may have to subcontract the cost loaded schedule preparation and maintenance to a project control firm that has the necessary tools and experience.
  Recommendation: Some agencies have provisions for spreadsheet applications for small projects under $1 million - giving administrative relief to SBE contractors.

- Procedure: The PUC withholds retention from contractor's progress payments in accordance with the contract specifications. However, there is no CM procedure for retention methodology or provisions for when to release the retention.

  Observation: Some agencies release a portion of retention when a subcontractor on a large project completes their portion of the work well before the contractor completes. For example, site preparation, foundation excavation and piling construction is typically done early on a project. On the Sunset Reservoir Rehab project, the contractor requested a change to the specification to obtain an early release. The change was granted.
  Recommendation: Although the specifications and contract documents provide for retention, it would be helpful to field engineering personnel if the CM procedures spelled out the process to follow or reference the specification section that covers retention.

- Procedure: There is no provision in the CM procedures for establishing an escrow account in lieu of withholding retention.
  Observation: Many agencies managing large projects, including the PUC, offer the contractor the option of establishing a third party interest bearing escrow account. This allows the contractor to earn interest on the retention which can result in a cost savings for the City and the Contractor.
  Recommendation: Although the specifications and contract documents provide for retention, it would be helpful to field engineering personnel if the CM procedures spelled out the process to follow or reference the specification section that covers retention.

- Procedure: There is no CM procedure for the Project Team to react to Stop Pay & Mechanics Liens submitted by subcontractors and suppliers during construction.
  Observation: The Stop Pay and Lien Methodology can be a cumbersome procedure involving the legal and accounting departments as well as the project team and the contractor. In order to be certain that the stop pay is implemented close coordination is necessary between the responsible departments.
  Recommendation: Include a provision in this procedure for processing Stop Pay and Mechanics Liens or cross-reference the appropriate administrative procedure.

P016- Change Management

- Procedure: This procedure establishes the process for contract change management. It relates to the Project Management Procedure PM-2 which has a scope beyond the construction change process. It provides for the Project Manager to approve changes that are within the project contingency with proper notification to the RPM and upper management.
  Observation: The Change Authority amounts and responsibilities are adequate for the management of large projects.
  Recommendation: None at this time.

P032- Close Out

- Procedure: Contractor is to provide O & M manuals and Warranties upon Substantial Completion of the work.
  Observation: For Owners and agencies that have a Maintenance Management System (MMS), it is often helpful to get O & M Manuals (or technical input data) prior to Substantial Completion. This allows the O & M personnel sufficient time to load the preventive maintenance data into the system which allows for staffing plans and annual budgeting information driven by MMS.
  Recommendation: Change the procedure and the contract specifications to receive the O & M Manuals when the equipment is delivered to the contractor.

P036- Force Account

- Procedure: This procedure establishes the process for administering contractor force account (time and materials) work.
  Observation: The procedure discusses the method for paying the contractor for rented equipment by using rental rates. Some agencies set a percentage (%) of rental rates when contractor owned equipment is used for force account work. Generally, contractor owned equipment can be used as a discount to rental rates. The procedure is silent on the rate to be used. Phase A & B contractors applied the CalTrans rental rate, which is widely accepted in California.
  Recommendation: The procedure should spell out the process for reaching the agreed rental rate or cross-reference the specification section.

- Procedure: According to the procedure a Rough Order of Magnitude authorization is established for Force Account work and costs are tabulated daily.
  Observation: The procedure is silent on what steps to take when the ROM is reached and the work is not completed. Typically the engineer has to renew the authorization.
  Recommendation: The procedure should be modified to cover this event.

VI. Review of PUC's Overhead Cost Recovery Methodology

As of November 2009, there were $4,349,949 of Overhead charges allocated to the Sunset Reservoir-North Basin project (Ref. FAMIS S CHAR #20). The allocations are based on the cost allocation methodology approved by PUC. We tested the allocated Overhead amounts (as provide by PUC) for each project against the construction budget to create a unit rate of allocated Overhead as shown below. Although PUC's Overhead cost allocations are not calculated based on project construction values, the purpose of using this unit basis comparison is to evaluate whether there is a proportionate relationship between output (construction) and input (allocated costs). Stated another way, for every dollar that a project spends on construction, how much is it spending on Overhead expenses? This analysis highlights the behavior of a particular cost component associated with implementing a capital project (or else it would not be included as a charge to the project) and can serve as a basis to benchmark data over time and to prepare future capital budgets/budget requests.

As shown in Figure 31, we used budgeted construction dollars, as this information was readily available. We recognize that comparing actual allocated costs to actual to date construction could be considered more of an "apples to apples" cost comparison. We also note, however, that the resulting ratios, when using an actual-to-actual comparison, may result in a much higher ratio than presented below, because the denominator will be equal to or less than budgeted amount. We also compared the resulting unit rate of the Sunset Reservoir-North Basin against four other projects to see if the unit rate correlated across construction value. The test shows that allocated Overhead amounts do not necessarily correlate with budgeted construction values: the larger construction values do not result in a higher Overhead allocation.

Figure 31. Allocated Overhead Amounts and Derivation of Overhead Unit Rates for Selected Projects

Project	Allocated Overhead (OH) *	Budgeted Construction	Allocated OH/Budgeted Construction
WSIP Project	(A)	(B)	(C)=(A)/(B)
Sunset Reservoir – North Basin	***$4,349,949***	***$53,506,000***	***0.08***
New Crystal Springs Bypass Tunnel	$3,071,987	$66,025,000	***0.05***
Tesla Treatment Facility	$2,020,034	$85,840,000	***0.02***
Baden and San Pedro Valve Lot Improvements	$2,010,893	$16,677,000	***0.12***
Pulgas Balancing - Discharge Channel Modifications	$362,826	$1,571,000	***0.23***

* Allocated overhead data for FAMIS Character 20 from FAMIS print out dated November 16, 2009.

We also determined that different overhead rates were applied to different projects, based on data provided by PUC staff as shown in Figure 32 and found that the resulting overhead rates vary by project.

Figure 32. Overhead Rates Based on Each Project's Direct Labor Expenses

Project	Salaries (FAMIS Char 01)	Overhead (FAMIS Char 20)	OH Rate
	(A)	(B)	(C)=(B)/(A)
CUW0358 - Sunset Reservoir	2,743,625.00	4,349,949.00	1.59
CUW35601 - New Crystal Springs Bypass Tunnel Project	1,951,456.91	3,071,986.70	1.57
CUW38401 - Tesla Treatment Facility Project	1,373,458.51	2,020,034.32	1.47
CUW39101 - Baden and San Pedro Valve Lot Improvements Project	1,409,584.79	2,010,893.34	1.43
CUW36102 - Pulgas Balancing - Discharge Channel Modifications Project	1,276,873.63	1,954,889.04	1.53

According to PUC staff, Overhead rates are adjusted to ensure full Overhead cost recovery, can vary year to year, and also can be adjusted within a given year. Therefore, projects spanning several years will experience Overhead charges and rates that vary over time.

VII. Conclusions

Summary of Findings, Risks and Recommendations

The consulting team's overall conclusions are summarized below. A detailed listing of all findings, risks and recommendations is provided at the end of the Executive Summary.

- The PUC provided adequate explanations of all schedule changes associated with the Sunset Reservoir – North Basin project, and in general, the approved schedule changes conformed to PUC's policies and procedures.

- PUC's construction management and project management policies and procedures are consistent with industry practice for large infrastructure programs.

- PUC demonstrated the capability to provide explanations of what changes occurred in the project's budget from 2005 through 2009 at the phase level, but in certain instances, those explanations did not adequately address why those changes occurred. We have offered comments on each of PUC's explanations, and recommendations for how PUC could improve its responses to similar questions in any future project audits.

- PUC management and PUC's stakeholders, such as the RBOC, could benefit from the use of "Key Performance Indicators," which can provide a better sense of whether projects are facing scope, schedule and/or budget pressure than what is currently presented in the WSIP Quarterly Project Status Reports. The use of Key Performance Indicators may identify specific WSIP projects for which more detailed risk assessments and risk modeling would be appropriate.

- We tested the allocated Overhead amounts for the Sunset Reservoir project, and four other WSIP projects. We compared each project's Overhead allocation against its construction budget to create a unit rate of allocated Overhead to see if the unit rate correlated across construction value. The test shows that allocated Overhead amounts do not necessarily correlate with budgeted construction values: the larger construction values do not result in a higher Overhead allocation.

Possible Topic for Future Analysis

This report provides the RBOC with a template for a highly detailed review of a revenue bond-funded PUC construction project. However, this type of detailed review of every WSIP project would not be practical or cost-effective to undertake. Going forward, the consulting team recommends that the RBOC consider pursuing the following course for independently assessing how WSIP projects are performing, and identifying which projects should undergo analysis:

- Establish Key Performance Indicators, based on leading industry practice, and apply those indicators to all WSIP projects. The KPI format should produce a green light/yellow light/red light indicator report format that identifies those projects that are proceeding smoothly, and those projects that may require more attention.

Figure 33 Mock-Up of Key Performance Indicator Summary Report

Key Performance Indicator	Indicator Status
Performance Indicator 1	
Performance Indicator 2	

It is important to note that simply because a project that has a "red light" on one or more indicators does not imply that it is being mis-managed, it simply means that the project faces challenges, and must be carefully monitored and managed by PUC staff and stakeholders.

- Develop periodic WSIP KPI reports for review by the Committee.

- Focus attention on those WSIP projects that face the greatest challenges, based on the KPI analysis, by conducting brief audit reviews that concentrate on understanding the challenges that the projects face, how the challenges are being addressed and mitigated by PUC, and any "how and why" questions concerning changes to the project schedule, scope and budget that have occurred since November 2005.

Appendix 1 – Documents Reviewed by Consulting Team

Key Documents Requested	Received
Commission Resolutions	Yes
Design Contract and any Contract Amendments	Yes
Project Management Contract	No PM contract specifically for Sunset Reservoir
Construction Contract and any Contract Amendments	Yes
Construction Management Contract/ Contract Amendments	CM support via DPW
Construction Schedule Baseline and The As-built Schedule	Yes
Change Order Log	Yes
Engineer's Estimate	Yes
Project Management Policies And Procedures	Yes
Construction Management Policies And Procedures	Yes
Change Order Policies And Procedures	Yes

Appendix 2– Chronology of Sunset Reservoir Construction Contract Base Awards, Contract Modifications and Budget Changes

Description	Phase A - Soil Embankment	Phase B – Seismic Improvement and Reservoir Relining	Security Upgrades	Total Construction
Engineer's Estimate	$9,393,000	$41,773,314	$246,056	$51,166,314
Phase A - Construction Award	$6,799,376			
Award Date	3/8/2005			
Phase A - Modification 1	$54,990			
Mod Date	8/25/2005			
Phase A - Modification 2	$382,123			
Mod Date	10/11/2005			
November 2005 WSIP - Construction Phase Budget				*$47,632,000*
Phase A - Modification 3	$100,000			
Mod Date	2/6/2006			
Phase A - Modification 4	$24,627			
Mod Date	4/17/2006			
Phase B Construction Award		$41,776,700		$49,137,816
Award Date		9/26/2006		
Phase A - Modification 5	$47,929			
Mod Date	12/1/2006			
Phase A - Modification 6	$5,113			
Mod Date	2/2/2007			
Phase B - Modification 1		$418,325		
Mod Date		5/24/2007		
December 2007 Construction Phase Budget				*$53,506,000*
Phase B - Modification 2		$737,637		
Mod Date		2/20/2008		
Phase B - Modification 3		$1,144,293		
Mod Date		9/26/2008		
Phase B - Modification 4		$102,265		
Mod Date		2/12/2009		
Phase B - Modification 5		$65,154		
Mod Date		7/20/2009		
FINAL CONSTRUCTION CONTRACT COST including all modifications	$7,414,158	$44,244,374	$246,056	$51,658,532
June 2009 Construction Phase Budget				*$52,704,000*