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San Francisco, California

Review of Water System Improvement Program Expenditures Under PUC's Commercial Paper Program

Final Report to Public Utilities Revenue Bond Oversight Committee – REVISED AND UPDATED

July 17, 2006

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Executive Summary

On January 30, 2006, the Revenue Bond Oversight Committee (RBOC) awarded a financial consulting contract to the team of Robert Kuo Consulting, LLC and Lawrence Doyle to conduct a financial review of the use of Commercial Paper to finance the Public Utilities Commission's (PUC) Water System Improvement Program (WSIP) for the period from July 1, 2003 through December 31, 2005. In certain cases, our review included data through March 1, 2006. This Report is the product of our financial review.

Authorized Uses of Commercial Paper Proceeds

- The authorizing documents we reviewed provide broad definitions of what could be deemed as an "appropriate" expenditure of Commercial Paper proceeds in connection with the WSIP.

- In the case of the San Joaquin Pipeline System project, the Sunol Valley subregion, and the Calaveras Dam project, greater restrictions have been placed on the use of Commercial Paper proceeds through Supplemental Appropriation Ordinance 196-05 adopted by the Board of Supervisors in 2005. In our sampling, we found no instances where PUC had spent Commercial Paper funds in a manner that did not conform to the authorizing documents.

- The WSIP's appropriation amounts are being tightly managed by the Board of Supervisors. This in turn requires careful management of the appropriations status of each WSIP project by PUC staff.

Review of Use of Commercial Paper to Fund WSIP

- From November 2003 through March 1, 2006, the PUC issued a total of $120 Million in Commercial Paper Notes to finance all expenses related to the WSIP, including the interest expenses and issuance costs associated with the Notes. The interest expenses during this period totaled $3.4 Million, and issuance costs (e.g. the fees associated with the Letter of Credit, and fees for rating agency, dealers, and legal counsel, among others) totaled approximately $1.3 Million. PUC also earned approximately $900,000 in interest earnings from the investment of unspent Commercial Paper proceeds by the City Treasurer.

- Based on our analysis, using Commercial Paper to finance WSIP expenses from November 2003 through March 2006 was less expensive than issuing revenue bonds for this purpose. Our overall assessment is that the financing strategy utilized to date for the WSIP has been prudent.

- The format that the RBOC developed for Task 3 of this Review provides a useful summary format for tracking WSIP project budgets, appropriations and expenses. We recommend that this format, which can be found in Figure 11 (page 40), or a similar reporting format, be included in the WSIP Quarterly Report, updated for the RBOC on at least a quarterly basis, and for PUC management on a monthly basis for their use as a management tool.

- The cost of the services provided to the WSIP by Other City Departments is already being charged to the WSIP. There are no plans to "transfer" expenses from the operating budget to the WSIP (Proposition A bond funds) at a later date. We recommend that expenditures on the services of PUC staff and other City Departments be monitored by the RBOC on an annual or semi-annual basis. RBOC's objective should be to ensure that the PUC continues to keep this issue on their radar screen by periodically reviewing its status.

<u>Review of Calaveras Reservoir, San Joaquin Pipeline, Bay Division Pipeline and Irvington Tunnel Projects</u>

- Based on our detailed review of the financial records for these four projects, the financial data used in the "Primavera" System, a project management system that is used to track project budgets, schedules and expenses, among other things, is being reconciled to financial data from the City's FAMIS system. Primavera is the source of the financial data used to prepare the WSIP Quarterly Reports, so it is important for the data to tie to the City's official financial records as closely as possible.

- We were able to verify that there were no expenditures charged to any of the Proposition A projects under review prior to November 2002. We determined that salaries attributable to these projects were charged to PUC general revenues ("pre-CIP funds") both prior and slightly after November 2002.

- We confirmed that $19.6 million in "pre-CIP" general revenues and bond proceeds (from bonds issued prior to the adoption of Proposition A) have been spent on the WSIP).

- Although the invoice approval process appears to be cumbersome, we found no problems with any of the 56 invoices that we vouched, representing approximately $5 million in expenditures.

Review of WSIP Budget and Management Reports

- The November 2005 WSIP budget provides a level of detail on each project's budget that will allow the RBOC to clearly track how project budgets change as they progress through the development process, and to the extent that project cost estimates increase over time, how much of each project's contingency funds remain intact. By tracking the status of available contingency funding throughout the life of the Program, the RBOC will be able to monitor whether pressure on the Program's scope or overall budget is likely to develop.
- The PUC has drafted a set of budget control procedures for all capital projects, known as Change Control procedures, which are expected to be finalized by the end of June 2006. These procedures will be critical to the management of the WSIP scope, schedule and budget. Once the procedures are finalized, the RBOC should be briefed on how they will work.
- The Commission has indicated that they will review the status of each WSIP project, and focus attention on problem areas.
- The WSIP Quarterly Report is the primary vehicle that will be used to keep stakeholders apprised of the status of the WSIP. The first Quarterly Report, which covered the period ending December 31, 2005, was a good initial product, and it addressed the issues or challenges facing the WSIP in a direct fashion. Based on a brief review of the March 2006 Report, PUC is continuing to make improvements to the Report's format.
- However, the PUC must find a way to distill the key information and issues in the Quarterly Report for decision-makers. The Quarterly Report could be improved by adding summary tables organized by project and subregion, such as the one shown in Figure 11, and ensuring that each WSIP project has its own project status report (note: as of the March 2006 Quarterly Report, each project now has its own status report). As of May 2006, the WSIP Quarterly Report has been posted on the PUC's website, and PUC now prominently features the WSIP Quarterly Report on its Agency's home page.

<u>Issues to Watch and Potential Topics for Future Inquiry</u>

- *Project Scope, Schedule and Cost Uncertainty*
  - Many WSIP projects face significant uncertainty with regard to project scope and schedule, both of which could significantly affect a project's final cost.
  - Although PUC has built a substantial amount of Contingency funding throughout the WSIP budget ($454 million in construction estimate contingency and $225 million in construction cost contingency for a total of $679 Million), it is still quite early in the life of the WSIP, and several factors could cause the overall $3.7 Billion WSIP budget (excluding financing costs) to come under pressure.
  - Reasons for scope, schedule and cost changes could include:
    - Changes in policy that affect the WSIP's Level of Service Goals;
    - Changes in cost estimates determined during the project design process;
    - Changes in schedule driven by the environmental review process;

- Changes in schedule and cost driven by right of way acquisition requirements; and
- Changes in schedule, scope and cost driven by weather-related delays and unforeseen conditions.

- *Determinations of Prioritization and Overall Program Affordability*
  - Early on in the life of the WSIP, proposed budget changes will be funded from on each project's own contingency reserves, leaving the rest of the Program's budget unaffected. Over time, however, increases in a project's budget may be above and beyond a project's own contingency reserves. That raises the question of how such budget changes would be funded.
  - PUC may face the choice of whether to scale back the scope of one or more projects, or to increase the overall budget of the WSIP program. And that raises the question of how PUC will determine what level of changes are affordable.
- *"Change Control" Challenges*
  - Even once a rigorous Change Control review and approval process is finalized, the PUC will face challenges associated with:
    - Managing geographically dispersed projects;
    - Keeping up with the pace of changes, which is likely to accelerate once major projects move into design and then construction; and
    - Confronting pressures to make changes to project scopes after the design process has been completed.
- *Effective Communications with Stakeholders*
  - Communicating regularly and effectively with the WSIP's many stakeholders will be critical to the ultimate success of the WSIP. PUC must ensure that it eliminates "surprises," and maintains the credibility of its cost estimates, even as those estimates change over time.
- *Role of PUC Finance Staff in Project Funding Decisions*
  - The bond rating agencies periodically will turn to PUC Finance staff for up-to-date information about the status of the program. Keeping Finance "in the loop" will permit them to quickly and accurately respond to rating agency requests for information, and ideally to communicate with the rating agencies on a proactive rather than a reactive basis.

Potential Topics for Future Inquiry

We recommend that the RBOC consider the following list of topics as possible future areas of inquiry.

1. *Annual Review of Appropriations and Expenditures for 5-10 Randomly Selected WSIP Projects*

   - This standard audit task would consist of several of the subtasks that were included in Task 3 of this engagement.
   - We recommend that the next review begin in September 2006, using year-end FY2006 data from FAMIS and Primavera. The RBOC's consultant will need to be sensitive to the competing demands on PUC Finance staff during that period, as they also will be working with their external auditors on the PUC's FY2006 financial statements at the same time.

2. *Develop Detailed Understanding of How A WSIP Project Budget Is Built and How A Project Budget Is Managed*

   - Gain an understanding of how a project's budget is derived from the bottom-up.
   - Then, once the Change Control procedures are finalized, the RBOC should review those procedures so that the Committee understands how the PUC intends to control scope, schedule and costs, and who will be making the decisions on these issues.

3. *Focus Attention on Limited Number of High Profile Projects*

   - Identify 10 projects, starting with the highest cost WSIP projects at the outset, ideally including projects that are at various stages of development (planning, design and construction).
   - Receive regular status reports concerning those projects, and changes to each project as it progresses through the development process.
   - Amend the list of projects over time to focus on those facing the greatest uncertainty regarding scope, cost and schedule.

4. *Debt Strategy Review*

   - Examine how PUC currently intends to finance the WSIP, how the WSIP financing program fits into the PUC's larger bond financing strategy, the policies that affect the financing plan (e.g. debt service coverage target, O&M reserve target), and the pros and cons of the various debt structuring alternatives available to the PUC to manage its debt service expenses.

Introduction - Overview of Report

Proposition P was adopted by San Francisco voters in November 2002, and established the Public Utilities Revenue Bond Oversight Committee (RBOC). Among other things, the role of the RBOC is to monitor the expenditure of revenue bond proceeds issued for the repair, replacement, upgrading and expansion of the City's water collection, power generation, water distribution, and wastewater treatment facilities to ensure that the funds are spent according to authorization and applicable laws. In the course of carrying out their oversight responsibilities, the RBOC is authorized to engage the services of third parties to perform an independent review and evaluation of the disbursement and expenditure of revenue bond funds.

On January 30, 2006, the Revenue Bond Oversight Committee (RBOC) awarded a financial consulting contract to the team of Robert Kuo Consulting, LLC and Lawrence Doyle to conduct a review of the use of Commercial Paper to finance the Public Utilities Commission's (PUC) Water System Improvement Program (WSIP) for the period from July 1, 2003 through December 31, 2005. This Report is the product of our financial review. In some cases, we have presented information through March 1, 2006.

Tasks Covered By Our Financial Review

Our work scope identified the following tasks as part of our financial review of the Commercial paper program:

Task 1 (Start-Up): Review background Commercial Paper Program and WSIP documents, and conduct kick-off meetings.

Task 2: Obtain and review a list of Water System Improvement Program projects inclusive of those funded to date (November 1, 2003 – March 1, 2006) by the Commercial Paper program.

Task 3: For each project, obtain a schedule of the initial (from the CIP adopted in May 2002 and amended August 2003) and current (adopted November 2005) project budgets, appropriations, funding sources and project expenditures incurred to date.

Task 4: For each of the four projects: 1) Calaveras Reservoir, 2) Bay Division Pipelines, 3) San Joaquin Pipelines, and 4) Irvington Tunnel, perform the following detailed analyses:

a. Reconcile the initial project budget and the CIP adopted by the PUC in May 2002 and amended in August 2003. Reconcile the current (November 2005) project budget and the current WSIP.
b. Obtain an explanation of the changes from the initial project budget to the current project budget. Review the explanations for reasonableness.
c. Obtain a reconciliation from PUC staff of the project budget and actual expenditures from the PUC's program controls system (P3E) system to the FAMIS system. Review the reconciliation for appropriateness. Identify and provide explanations of significant reconciling items and/or where figures do not reconcile.

d. Reconcile the CIP appropriations and transactions in the FAMIS system.
e. Reconcile the CIP appropriations and the authorizing budgetary documents adopted by the Board of Supervisors.
f. Vouch a sample of expenditures to invoices, contracts, and other supporting documentation.
g. Verify that no expenses paid for with Proposition A funds were incurred prior to November 2002.
h. Identify any discrepancies detailed above in subtasks a-g and provide explanations.

Task 5: Determine if there are any projects (demand forecasting, etc.) and/or employees currently not being paid from the Commercial Paper program that SFPUC plans to transfer to the WSIP and pay thereafter from revenue bond proceeds. If so, determine if part or all of their past salaries and past-project costs will be capitalized and paid out of revenue bonds.

Task 6: Review the SFPUC's program controls system (P3E) and internal control procedures for accounting of capital projects. Identify how changes in budget, scope, and schedule are accommodated. Identify the key reports that are used to monitor the WSIP program; assess frequency and usefulness of system's reports used by project managers, Board of Supervisors, PUC Commission, senior management, outside stakeholders, or other state and local agencies. Provide recommendations for areas of improvement.

Task 7: Prepare a final written report to the RBOC. Meet with the RBOC to present the findings and address questions.

The Report is organized in the following manner:

Chapter 1 of this Report presents the following information:

- Background on Commercial Paper; and
- Our understanding of the purposes for which Commercial Paper proceeds may be expended by the PUC in connection with the WSIP, based on our review of the provisions of Proposition A, legislation adopted by the PUC and the Board of Supervisors appropriating funds for the WSIP, and PUC's Commercial Paper Tax Certificate.

Chapter 2 of this Report presents the results of the following tasks:

- A summary of the financing costs associated with the PUC's Commercial Paper Program;
- A comparison of the financing costs associated with using Commercial Paper versus long-term revenue bonds to finance the WSIP from November 2003 through March 2006;
- A discussion of the rationale behind the use of Commercial Paper in connection with the financing of a construction program;

- A summary of all WSIP projects funded from the PUC's Commercial Paper program, with a brief description of each project, and their start and completion dates (Task 2); and

- A summary that compares the budgets for each project across the three iterations of the WSIP (May 2002, August 2003 and November 2005), and presents the amounts appropriated and expended through March 1, 2006 by project (Task 3).

Chapter 2 also presents the results of Task 5.

Chapter 3 of this Report presents the results of Task 4.

Chapter 4 of this Report presents our comments and recommendations in connection with Task 6.

Chapter 5 of this Report presents our recommendations for issues that the RBOC should watch over time, and potential topics for future inquiry by the RBOC.

We presented this draft report to the RBOC's Contracting Working Group on April 18, 2006. We delivered a "Committee Draft" report to the RBOC on April 25, 2006, and met with the RBOC to discuss our findings on May 1, 2006. We obtained comments from RBOC members on May 12th, and presented our Report on June 12, 2006. At the RBOC's June 12th meeting, the Committee requested that we revise our discussion of Task 4b concerning the changes in project scopes and budgets from May 2002 to November 2005. We have done so in this "Revised and Updated" version of the report, and have also expanded on our analysis in Chapter 2. The Final Revised & Updated report was accepted by the RBOC at its July 17, 2006 meeting.

Documents Reviewed

The table below summarizes the list of documents that we requested to review as part of this engagement, and whether those documents were available.

Figure 1. List of Documents Received as of June 2006

Task Number	Document Description	Received
Task 1 – Start-Up	Commission approval of CP issuance – March 25, 2003	✓
	Board of Supervisors approval of CP issuance (resolution, Budget Analyst report), Files 03-0630 and 03-0617, and Final Board Resolution 03-300 dated April 17, 2003	✓
	Commercial Paper Tax Certificate	✓
	Commission agenda item and resolution on 2006 Prop A Bonds Series A and Series B	✓
	Board of Supervisors package (resolutions, Budget Analyst report) for 2006 Prop A Bonds Series A and Series B – Files 05-1981 and 05-1982	✓
	Bond Indenture with US Bank dated August 1, 2002	✓
	1st Supplemental Indenture with US Bank (draft, to be dated March 1, 2006)	✓
	Commission Reimbursement Resolution dated March 25, 2003	✓
	Long Range Financial Plan Update dated October 27, 2003	✓
	Statements From Commercial Paper Issuing & Paying Agent concerning CP Notes Issued and Interest Expenses; Worksheet from PUC concerning expenses paid from Commercial Paper proceeds, including issuance costs	✓
Task 2	List of WSIP projects funded from CP from July 1, 2003 – December 31, 2005	✓
Task 3	CIP adopted May 2002	✓
	November 2005 WSIP Program Descriptions – file dated January 18, 2006	✓
	For each WSIP project, estimate of additional WSIP expenditures a) to be incurred from January 1, 2006 through the date of issuance of 2006A Bonds and b) paid for by the Commercial Paper program, if any	✓
	Excel file entitled "WSIP Spending Plan as of December 2005"	✓
	Excel file entitled "FAMIS WSIP 02 28 06 and 03 31 06"	✓

Task 4	Excel file entitled "WSIP Jan Feb 2006"	✓
	Commission resolutions and Board of Supervisors ordinances appropriating funds for WSIP	✓
	Primavera Reports for 1) Calaveras Reservoir, 2) Bay Division Pipelines, 3) San Joaquin Pipelines, and 4) Irvington Tunnel with project budgets and expenditures from program inception through December 31, 2005	✓
	AB1823 Report dated January 2006.	✓
	May 2002 CIP Project Summaries for Calaveras Reservoir, 2) Bay Division Pipelines, 3) San Joaquin Pipelines, and 4) Irvington Tunnel	✓
	Reconciliation of the project budget and actual expenditures from the SFPUC P3E (Primavera) system to the FAMIS system.	✓
	FAMIS reports covering 1) Calaveras Reservoir, 2) Bay Division Pipelines, 3) San Joaquin Pipelines, and 4) Irvington Tunnel projects with budget and expenditure data through December 31, 2005 (or online access to FAMIS)	✓
Task 5		
	WSIP program budget; Parsons Report discussion of Dept and Agency Costs	✓
	December 2005 WSIP Quarterly Reports (Regional & Local)	✓
Task 6	Draft Project Change Control Procedures	✓

Chapter 1. Appropriate Uses OF Commercial Paper Proceeds In Connection With the WSIP

Background on Commercial Paper

Commercial Paper is a type of short-term borrowing instrument (a "note"). Unlike fixed rate bonds, which have a fixed term, Commercial Paper notes can be issued with maturities ranging from 1 day to 270 days. Generally, there will be many notes with different principal amounts, maturity dates and interest rates outstanding under a Commercial Paper program at any one time. The interest rate is set for the term of each note and interest is paid only at maturity. The principal and interest on each maturing note may be paid by selling a new note (a "roll over"), from the proceeds of long-term bonds ("take out"), or from other funding sources, such as the debt service fund of an agency's operating budget. Since the original note that is issued to fund a project or projects may be rolled over into new notes many times before the final note is taken out with long-term bond proceeds, it is important for the issuer to be able to trace each Commercial Paper note back to the project(s) that were initially funded. This exercise requires a good note tracking system and knowledgeable finance staff, and allows an issuer to regularly monitor its compliance with expenditure deadlines for the use of tax-exempt proceeds and other tax-related requirements.

Using a portion of the proceeds from the 2006 Series A revenue bond issue, which was closed on March 15, 2006, the PUC "took out" or refinanced $120 million in outstanding Commercial Paper with the proceeds of long-term refunding bonds.

Appropriate Uses Of Commercial Paper Proceeds

The fundamental question that the RBOC asked us to review is whether the PUC thus far has spent Commercial Paper proceeds appropriately in connection with the WSIP. In order to answer that question, we have turned to several documents to develop our understanding of what constitutes an "appropriate use" of Commercial Paper in this context. Of the documents that we reviewed, the WSIP Supplemental Appropriations Ordinances adopted by the Board of Supervisors provide the most restrictions regarding the "appropriate use" of the PUC's Commercial Paper proceeds.

<u>Proposition P</u>

As indicated in the text of Proposition P, the role of the RBOC is to:

- "…provide oversight to ensure that: 1) The proceeds from revenue bonds authorized by the Board and/or the voters of the City are expended in accordance with the authorizing bond resolution and applicable law; 2) Bond proceeds are expended solely for the uses, purposes and projects authorized in the bond resolution; and 3) Revenue Bond funds are appropriately expended for authorized capital improvements so that an uninterrupted supply of water and power continues to flow to the City and to the PUC's customers" (Section 5.31(b)).

- In addition, Proposition P states that "if after conducting all appropriate reviews and an independent audit of revenue bond proceeds by the PUC…the Committee, after consultation with the City Attorney, determines that revenue bond proceeds are being or have been expended for purposes not authorized by the authorizing bond resolution or otherwise amount to an illegal expenditure or illegal waste of such revenue bond proceeds within the meaning of applicable laws, the Committee may, by majority vote of all its members, prohibit the further issuance or sale of authorized public utility revenue bonds which have yet to be issued or sold." (Section 5.34)

Based on our understanding of Proposition P, we have looked to the following "authorizing" documents for guidance on what constitutes appropriate expenditures of Commercial Paper proceeds:

1) Proposition A;

2) The Board of Supervisors resolution and the PUC resolution approving the issuance of Commercial Paper for the WSIP;

3) The Commercial Paper Tax Certificate; and

4) The supplemental appropriations associated with the WSIP that have been approved by the Board of Supervisors and the PUC.

Proposition A

Adopted in November 2002, Proposition A authorized the PUC to issue up to $1.628 Billion in revenue bonds or other forms of revenue financing "to finance the acquisition and construction of improvements to the City's water system" (Section 1). Proposition A defined the terms used in the above sentence in the following way:

- "Improvements" shall mean improvements that will restore, rehabilitate and enhance the ability of the PUC to deliver water to users of the City's water system, such improvements to include, but are not limited to, water delivery and seismic improvements, water quality improvements, water supply improvements, and watershed and environmental improvements as set forth in the San Francisco PUC's Capital Improvement Program (CIP), as such CIP may be amended from time to time;

- "City's Water System" shall mean the entire water supply, storage, treatment and distribution system and auxiliary and related facilities under the jurisdiction of the PUC, as such system may be modified and extended from time to time;

- "Other forms of revenue financing" shall include notes, debentures, Commercial Paper, variable rate demand notes and bonds, auction rate securities, lease revenue bonds, installment sale agreements and other forms of similar financial products, which may be created from time to time;

- "City's Regional Water System" shall mean facilities for the storage, treatment and transmission of water operated and maintained by San Francisco in the counties of Tuolumne, Stanislaus, San Joaquin, Alameda, Santa Clara, San Mateo, and three terminal reservoirs in San Francisco.

Section 2 of Proposition A stated that: "The purpose for which the Bonds are proposed to be issued is to *finance the acquisition and construction of improvements to the City's water system, including without limitation capitalized interest on the Bonds and any other expenses incidental thereto or connected therewith.* The estimated cost of the improvements is $1,628,000,000. Said estimated costs includes *all costs and expenses incidental thereto or connected therewith, including, but not limited to, engineering, inspection, auditing, legal and fiscal agent fees, cost of the revenue bond election and the costs of the issuance* of the Bonds." (Emphasis added).

PUC Resolution Authorizing Use of Commercial Paper for WSIP

The PUC adopted its Resolution authorizing the use of up to $250 million in Commercial Paper "for the purpose of providing flexible construction financing for Water Enterprise capital improvement projects" on March 23, 2003.

Board of Supervisors Resolution Authorizing Use of Commercial Paper for WSIP

Board of Supervisors Resolution 300-03 (adopted on May 6, 2003) authorized the issuance of up to $250 million (principal amount, excluding interest) in Commercial Paper notes outstanding at any one time "for the purposes of financing and refinancing the costs of improvements, betterments and additions to the Water Enterprise, as well as paying costs of issuance and other incidental costs, all in accordance with Proposition A".

Commercial Paper Tax Certificate

In a tax-exempt financing, the "Tax Certificate" is a document that is signed by the financing's issuer, in which the issuer states various "factual representations" that form the basis for the legal opinion that the interest paid to investors who purchase the debt instrument (in this case, Commercial Paper notes) may be excluded from gross income under Federal tax law. The PUC's Commercial Paper Tax Certificate includes representations by the PUC regarding the use of the financing proceeds. The most recent Commercial Paper Tax Certificate, which is dated May 5, 2005, states that the PUC's Commercial Paper is to be used to (i) finance and refinance the costs of the "capital improvements related to the Water Enterprise"; (ii) to pay certain legal, accounting and financing expenses incurred in connection with the issuance of any portion of the Commercial Paper notes ("costs of issuance"); and (iii) to pay fees to the bank providing the "Letter of Credit" to support the Commercial Paper program.

Board of Supervisors Supplemental Appropriations Ordinances

In order to spend Commercial Paper proceeds for a particular purpose, the funds first must be appropriated by the Board of Supervisors. We reviewed the following four supplemental appropriations adopted by the Board in connection with the WSIP. Thus far, the Board of Supervisors has granted the WSIP additional appropriations authority on a periodic basis (i.e. for 12 or 18 month periods), rather than appropriating each WSIP project's entire budget up-front.

- This forces the PUC to carefully estimate its spending rate by project and subregion, so that they are prepared to submit a new supplemental appropriation request with sufficient time to complete the approval process before a project or subregion runs out of appropriation authority, and must halt its activities, which in turn could trigger delays and additional costs down the road.

Ordinance 104-03

Adopted on May 23, 2003, this Ordinance appropriated $66,075,000 in Commercial Paper proceeds for 47 specific Local and Regional CIP projects for FY2002-03.

Ordinance 65-04

Adopted on March 24, 2004, this Ordinance appropriated $12,985,734 of Commercial Paper and $2,747,247 in operating funds to fund staff expenses, office space, the services of other City Departments (Human Resources, Human Rights Commission, Department of Telecommunications and Information Systems, Airport, and Department of Public Works), the Programmatic EIR and the PUC-East Bay Municipal Utility District Inter-tie project for FY2003-04.

Ordinance 54-05

Adopted on April 1, 2005, this Ordinance appropriated $21,963,000 in Commercial Paper proceeds for 31 specific Local and Regional CIP projects for FY2004-05.

Ordinance 196-05

Adopted on July 29, 2005, this Ordinance appropriated $160,770,188 in Commercial Paper proceeds and $1 million in "Water Department Funds" with a greater degree of flexibility than was found in the prior appropriations. This Ordinance appropriated lump sum amounts for each of the five subregions, and for four Local Project Categories (reservoirs, pump stations/tanks, pipelines/valves and miscellaneous). In addition, the Ordinance appropriated funds for 10 specific Regional projects for FY2005-06 and the first six months of FY2006-07.

This Ordinance also included the following restrictions on the use of Commercial Paper proceeds for certain projects:

- San Joaquin Pipeline System: Expenditures for FY2005-06 and the first six months of FY2006-07 were limited to: 1) "Alternatives analysis, including developing a water supply alternative for the Program Environmental Impact

Report…" 2) general environmental analysis; and 3) "developing a policy based on scientific studies regarding Tuolumne River and other water releases to improve the natural habitat."

- Sunol Valley Water System Improvement Projects: Funds from this appropriation may not be allocated to the Alameda Creek Fishery Enhancement project. Any existing funds previously appropriated cannot be used for further design of the Alameda Creek Fishery Enhancement project until the PUC reviews and approves a policy related to flows and water releases.

- Calaveras Dam Replacement Project: The funds appropriated for this project in FY2005-06 are dedicated solely to the studies of the creek ecosystems, fish and other watershed habitat.

Limited Authority to Transfer Funds among Projects

In accordance with the provisions of Ordinance 196-05, the PUC is permitted to transfer of funds within sub-regions (e.g. from one Bay Division subregion project to another). This gives the PUC flexibility to manage its appropriated funds at the sub-region level, i.e., the ability to transfer funds from a project(s) that is not proceeding as quickly as planned to a project(s) within the same subregion that requires additional resources. In connection with these types of funding transfers, the Controller is required report to the Board of Supervisors on a quarterly basis regarding any transfers of "appropriation authority between PUC projects or sub-projects that would increase the total appropriation of the receiving project or allocated appropriation of the receiving sub-project by more than 10%." This budget transfer provision is consistent with the Controller's Policy on budget transfers applicable to all City Departments and City Administrative Code Section 3.18.

PUC staff indicates that they are not permitted to transfer funds between subregion programs or stand alone projects (e.g. from the Bay Division to Sunol Valley) without the approval of the Board of Supervisors.

Chapter 1 - Conclusions

- Based on our review, the authorizing documents described above provide broad definitions what could be deemed as an "appropriate" expenditure of Commercial Paper proceeds in connection with the WSIP.

- In the case of the San Joaquin Pipeline project, the Sunol Valley subregion, and the Calaveras Dam project, greater restrictions were placed on the use of Commercial Paper proceeds through the Supplemental Appropriation Ordinances adopted by the Board of Supervisors in 2005, covering the 18 month period from July 1, 2005 through December 31, 2006.

- The WSIP's appropriation amounts are being tightly managed by the Board of Supervisors. This in turn requires careful management of the appropriations status of each WSIP project by PUC staff.

Chapter 2. Review of Use of Commercial Paper Proceeds to Fund WSIP Projects

This chapter summarizes the results of Tasks 2 and 3 of this Financial Review. This chapter also summarizes the results of a supplemental analysis concerning the financing costs associated with the Commercial Paper program, and a comparison of those costs with the financing costs associated with issuing revenue bonds.

Commercial Paper Financing Costs

During the course of this engagement, the RBOC's Contracting Subcommittee asked us to undertake a supplemental analysis concerning the financing costs associated with the Commercial Paper Program.

Amount of Commercial Paper Issued

From the date that the first Commercial Paper was issued to finance the WSIP, on November 3, 2003, through March 2006, the PUC issued a total of $120 Million in Commercial Paper. Commercial Paper was utilized to pay all costs associated with the WSIP, including interest expenses associated with Commercial Paper Notes, and issuance costs. The amounts issued, and the dates of issuance, are as follows:

Figure 2. Commercial Paper Issued to Finance WSIP, November 2003 – March 2006 ($ in Millions)

Date of Issuance	New Commercial Paper Issued	Cumulative Commercial Paper Outstanding
11/3/2003	$25.0	$25.0
8/18/2004	$25.0	$50.0
2/1/2005	$3.0	$53.0
2/11/2005	$12.0	$65.0
2/16/2005	$12.0	$77.0
3/7/2005	$3.0	$80.0
9/26/2005	$10.0	$90.0
11/8/2005	$10.0	$100.0
11/14/2005	$13.0	$113.0
12/7/2005	$7.0	$120.0

The PUC issued additional Commercial Paper in increments over time, in amounts that they deemed necessary to meet cash flow requirements, rather than issuing a large amount of Notes (or bonds) at one time. This is standard practice for public agencies that use Commercial Paper as a short-term capital financing tool.

Commercial Paper Financing Costs

The services of a number of outside parties are required in order to implement a Commercial Paper Program. This section briefly reviews the roles of these parties, and then summarizes the costs they incurred by quarter from late 2003 through the first quarter of 2006.

Investors

Investors provide a loan to the PUC in an amount equal to the principal amount of the Commercial Paper Notes that they purchase. In exchange, on the date that the Commercial Paper Notes that they hold mature, investors receive their principal back plus an interest payment.

Letter of Credit Provider

Due to the short maturities of Commercial Paper Notes, issuers must maintain access to funds that can be used to pay the principal and interest on maturing Notes on very short notice. These funds are either in the form of their own cash reserves or credit support provided by one or more banks. The bond rating agencies require Commercial Paper issuers to have a strong source(s) of short-term liquidity available to repay maturing Commercial Paper in order for the programs to receive investment-grade ratings. Few public entities have the readily available cash reserves required to provide their own liquidity support for a Commercial Paper Program.

A Letter of Credit ("LOC") is a financial instrument under which one or more banks provide short-term liquidity by promising to make certain payments on short notice on behalf of a beneficiary, in exchange for a fee. The beneficiary of the LOC (in this case, the PUC) then has the obligation to reimburse the LOC bank for the amounts drawn under the LOC. The fee level is set as a percentage of the amount covered by the LOC. The LOC fee is typically the most expensive issuance cost associated with a Commercial Paper Program. The LOC bank also charges a flat fee for each "draw" against the LOC. The PUC's current Letter of Credit Provider is Bank of America.

Commercial Paper Dealers

The role of the Commercial Paper Dealers is to market the PUC's Commercial Paper Notes to prospective investors. Dealers are typically paid a fee that is expressed as a percentage of the principal amount of Notes that they marketed.

Issuing & Paying Agent

The Issuing and Paying Agent acts as the issuer's agent and issues the Commercial Paper Notes on its behalf. The Issuing and Paying Agent also performs duties similar to a bond trustee in a fixed rate bond transaction, by keeping records of Commercial Paper Notes that are issued and when they mature, by transferring draws under the LOC to the investors when the Notes mature, and by transferring reimbursement payments from the PUC to the LOC bank. The Issuing and Paying Agent receives a fee for its services.

Rating Agency Fees

The PUC obtained Commercial Paper Program ratings from two rating agencies, Standard & Poor's and Moody's, and pays fees to each rating agency for those services.

Legal Fees

These fees cover the costs of the PUC's counsel (City Attorney and outside counsel) and counsel to other parties in the transaction.

The table below summarizes the Commercial Paper interest expenses paid by the PUC from November 2003 through March 2006.

Figure 3. Summary of Commercial Paper Interest Expenses By Quarter November 2003 to March 2006

Quarter	Average Comm. Paper Outstanding By Quarter ($ in M)	Interest Payments During Quarter [1] and [2]
4th Quarter CY2003 (11/13-12/31/03)	$16.0M	$20,416.44
1st Quarter CY2004	$25.0M	$36,684.93
2nd Quarter CY2004	$25.0M	$83,671.24
3rd Quarter CY2004	$36.4M	$48,975.34
4th Quarter CY2004	$50.0M	$93,813.70
1st Quarter CY2005	$62.6M	$278,076.98
2nd Quarter CY2005	$80.0M	$391,087.12
3rd Quarter CY2005	$81.4M	$578,663.01
4th Quarter CY2005	$102.0M	$600,824.53
1st Quarter CY2006	$120.0M	$1,269,628.75
Total Interest Paid		$3,401,842.04

[1] Interest payments are made when a Commercial Paper Note matures. If a Commercial Paper Note has a maturity longer than 90 days, then it will not mature during a given quarter, and a larger interest payment will be due during one of the following quarters.

[2] Interest rates on Commercial Paper Notes rose between 2003 and 2006. For example, a $5 Million Note with a maturity of 150 day carried an annualized rate of 1.0% in November 2003 and again in April 2004. By January 2006, a $5 Million Note with a 126 day maturity carried an annualized rate of 3.13%.

The table below summarizes the other financing costs (known as "issuance costs") associated with the Commercial Paper Program, excluding interest payments.

Figure 4. Summary of Commercial Paper Issuance Costs By Quarter, November 2003 – March 2006

Quarter	Letter of Credit Fees	Rating Agencies	Dealer Fees	Legal Fees	Issuing & Paying Agent	Draw Fees Paid to LOC Bank	Other Expenses	Total Fees
4th Quarter CY2003	$0.00	$10,000.00	$0.00	$2,500.00	$0.00	$300.00	$15,150.00	$27,950.00
1st Quarter CY2004	$198,821.91	$2,590.00	$387.80	$0.00	$0.00	$150.00	$0.00	$201,949.71
2nd Quarter CY2004	$104,093.15	$1,166.00	$3,166.97	$55,545.68	$1,545.00	$300.00	$0.00	$165,816.80
3rd Quarter CY2004	$112,920.55	$17,750.00	$2,243.84	$0.00	$0.00	$300.00	$0.00	$133,214.39
4th Quarter CY2004	$112,920.55	$11,750.00	$3,393.49	$10,000.00	$1,713.00	$600.00	$0.00	$140,377.04
1st Quarter CY2005	$128,000.00	$0.00	$3,100.68	$0.00	$0.00	$1,050.00	$0.00	$132,150.68
2nd Quarter CY2005	$52,548.00	$24,500.00	$4,156.94	$103,058.50	$1,500.00	$450.00	$0.00	$186,213.44
3rd Quarter CY2005	$63,759.99	$4,697.00	$4,487.59	$0.00	$1,500.00	$0.00	$0.00	$74,444.58
4th Quarter CY2005	$102,910.87	$15,600.00	$1,664.38	$0.00	$0.00	$0.00	$0.00	$120,175.25
1st Quarter CY2006	$102,910.87	$5,638.00	$24,257.95	$0.00	$0.00	$0.00	$0.00	$132,806.82
Totals	$978,885.89	$93,691.00	$46,859.64	$171,104.18	$6,258.00	$3,150.00	$15,150.00	$1,315,098.71

Comparison of Financing Costs - Commercial Paper vs. Revenue Bonds

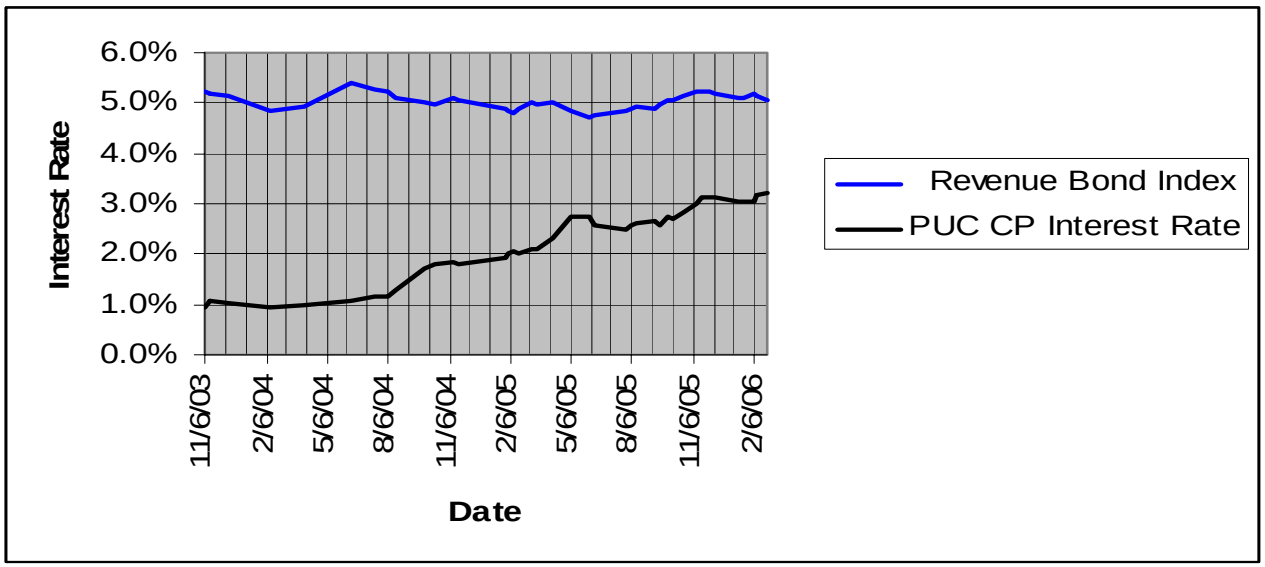
Our comparison of the financing costs associated with Commercial Paper vs. revenue bonds is presented in three parts. The first is the simplest, a comparison of the interest rates on the PUC's Commercial Paper vs. Revenue Bonds.

Interest Rates for Commercial Paper vs. Revenue Bonds

We reviewed data on the actual interest rates (excluding the impact of transaction costs) associated with PUC's Commercial Paper and compared them with data from the "Bond Buyer's Revenue Bond Index," an index created by a leading municipal bond market publication of the average interest rate associated with 30-year revenue bonds issued by 25 public agencies nationwide. On average, these agencies have long-term credit ratings that are equivalent to the PUC's (A1 from Moody's, A+ from Standard & Poor's). The data is displayed in the graph below and it provides a quick way of visualizing how Commercial

Paper interest rates have compared to long-term revenue bond rates since PUC began issuing Commercial Paper to finance the WSIP in November 2003. During this period, the PUC's Commercial Paper interest rates have ranged from 1.8% to over 4.0% lower than 30-year revenue bond interest rates. This "spread" between long-term rates and short-term Commercial Paper rates has decreased over this period.

Figure 5. Commercial Paper Interest Rates vs. 30-Year Revenue Bond Interest Rates



Comparison of Commercial Paper vs. Hypothetical Bond Issues

A. Hypothetical Revenue Bond Issues

In total, from November 2003 through March 2006, the PUC issued $120 Million in Commercial Paper Notes. As part of our supplemental analysis, we have been asked to compare the costs of financing the WSIP with Commercial Paper to the financing costs associated with one or more hypothetical revenue bond issues that could have been used to provide the same amount of financing proceeds. After reviewing the timing and amounts of Commercial Paper issuance by the PUC from November 2003 through March 2006, we developed two scenarios involving hypothetical bond issues that could have been used to raise the same $120 Million in financing proceeds:

- Bond Scenario 1: A Revenue Bond issue in November 2003 that would have raised $120 Million in financing proceeds for the WSIP.
- Bond Scenario 2:
  - A Revenue Bond issue in November 2003 that would have raised $50 Million in financing proceeds for the WSIP; and
  - A Revenue Bond issue in February 2005 that would have raised $70 Million in financing proceeds for the WSIP.

Transaction Costs Associated With Bond Issues

As with Commercial Paper, issuers incur a variety of expenses in connection with bond issues. These include:

- Additional debt service expenses are incurred if a portion of the proceeds of the bond issue is set aside to pay interest on the bonds for a specified period of time (known as "capitalized interest").
- Additional costs associated with the Debt Service Reserve Fund. This is a special account, held by the bond trustee, in which money is placed in reserve to be used to pay debt service, in the event that pledged revenues are insufficient to make debt service payments. In general terms, the debt service reserve fund may be funded in two ways: 1) With bond proceeds at the time of issuance, which increases the total amount of bonds issued, and therefore the debt service associated with the bond issue; or 2) Through the use of a surety bond, which results in the issuer incurring a premium expense for the surety.
- Bond Insurance Premium. Bond insurance is used to guarantee the payment of principal and interest to investors. It is often purchased by issuers in order to the take advantage of the lower interest rates associated with the "AAA" rating of the bond insurance company compared to the rates that the issuer would receive at its own rating level.
- "Underwriter's Discount" or the differential between the amounts paid to the issuer for the new issue and the prices at which the securities are initially offered to the investing public by the underwriter(s) of the bonds.
- Costs of Issuance. These include the costs of legal counsel, financial advisory services, rating agency fees, trustee fees and printing costs for the bond offering document.

The key assumptions regarding each bond issue, and its results, are described below. The "bond sizing" estimates (i.e. the size of the bond issue required to provide a given amount of financing for the WSIP) were developed using a Microsoft Excel bond sizing add-in package, using industry standard calculations. Clearly, the results that we developed for the hypothetical bond issues are only estimates, which are based on a variety of assumptions. But they provide a reasonable basis for comparing different approaches to financing the WSIP's cash flow requirements.

Sizing For Bond Scenario 1 - Hypothetical November 2003 $132.8 Million Bond Issue

The hypothetical 2003 bond issue provides $120 Million in financing proceeds for WSIP.

- As with the Commercial Paper program, the Hypothetical 2003 Bonds use bond proceeds to pay for interest expenses, in this case, two year's worth of capitalized interest, so that the debt service costs associated with the bonds would not flow into the water rate base until 2005. This increases the size of the bond issue by $11.4 Million.
- The other transactions costs increase the size of the bond issue by $1.6 Million. These include the underwriter's discount (assumed to be $2 per $1000 of bonds), bond insurance premium (assumed to be 0.35% of total debt service costs over the life of the bond issue), debt service reserve surety premium (assumed to be

3.3% of the amount required to fund the debt service reserve), and cost of issuance (assumed to be $200,000). These assumptions are based on the results of recent bond sales by the PUC or San Francisco Airport.

- Unspent bond proceeds placed in the "capitalized interest fund" are assumed to earn approximately $210,000 in interest, thus decreasing the total size of the bond deal by that amount.

- In total, based on these assumptions, a hypothetical November 2003 bond issue par amount of $132,795,000 would have been required to generate $120 Million in financing proceeds for the WSIP.

Sizing For Bond Scenario 2 - Hypothetical 2003 and 2005 Bond Issues

Because the WSIP's cash flow requirements were spread over time, as indicated above in Figure 2, we also have modeled two separate hypothetical bond issues to finance the WSIP's cash flow requirements from November 2003 through March 2006, rather than a single bond issue, to better match the timing of the issuance of the debt to the timing of the cash flow requirements.

i. Hypothetical 2003 $55.5 Million Bond Issue

- The hypothetical November 2003 bond issue provides the first $50 Million in financing proceeds for WSIP.

- As with the Commercial Paper program, the Hypothetical 2003 Bonds use bond proceeds to pay for interest expenses, in this case, two year's worth of capitalized interest, so that the debt service costs associated with the bonds would not flow into the water rate base until 2005. This increases the size of the bond issue by $4.75 Million.

- The other transactions costs increase the size of the bond issue by approximately $790,000. These include the underwriter's discount (assumed to be $2 per $1000 of bonds), bond insurance premium (assumed to be 0.35% of total debt service costs over the life of the bond issue), debt service reserve surety premium (assumed to be 3.3% of the amount required to fund the debt service reserve), and cost of issuance (assumed to be $200,000). These assumptions are based on the results of recent bond sales by the PUC or San Francisco Airport.

- Unspent bond proceeds placed in the "capitalized interest fund" are assumed to earn approximately $88,000 in interest, thus decreasing the total size of the bond deal by that amount.

- Based on these assumptions, a hypothetical November 2003 bond issue par amount of $55,460,000 would have been required to generate $50 Million in financing proceeds for the WSIP.

ii. Hypothetical February 2005 $72.3 Million Bond Issue

- The hypothetical February 2005 bond issue provides an additional $70 Million in bond proceeds for WSIP, bringing the total amount financed to $120 Million.
- The Hypothetical 2005 Bonds use bond proceeds to pay for one year's worth of capitalized interest, so that the debt service costs associated with the bonds would not flow into the water rate base until 2006. This increases the size of the bond issue by $1.4 Million. Interest earnings on the capitalized interest fund are estimated at less than $11,000.
- The other transactions costs increase the size of the bond issue by approximately $930,000. These include the underwriter's discount (assumed to be $2 per $1000 of bonds), bond insurance premium (assumed to be 0.35% of total debt service costs), debt service reserve surety premium (assumed to be 3.3% of the amount required for the debt service reserve), and cost of issuance (assumed to be $200,000).
- Based on these assumptions, a hypothetical February 2005 bond issue par amount of $72,325,000 would have been required to generate $70 Million in financing proceeds for the WSIP.

B. Comparison of Interest Rates, Including Transaction Expenses

At the May 1, 2006 meeting, the RBOC requested that we evaluate the "all-in" interest rates (including interest payments to investors and all transaction expenses) associated with the PUC's Commercial Paper Notes compared to the "all-in" interest rates associated with hypothetical revenue bonds that could have been issued to finance the same $120 Million.

The best measure of the "all-in" interest rate for a bond issue is known as the "All-In True Interest Cost" (TIC). The All-In TIC takes into account: a) The principal and interest payments made by the issuer; b) The transaction costs incurred by the issuer; and c) The "time value of money," that is, the fact that a dollar today is worth more than a dollar in the future, because today's dollar can be invested and earn interest that compounds over time. Technically, the TIC is defined as "the interest rate, compounded semi-annually, necessary to discount the amounts payable on the respective principal and interest payment dates to the purchase price received by the issuer for a new issue of bonds."

Our calculations indicate that for the period from November 2003 through February 28, 2006, the average all-in interest rate on the PUC's Commercial Paper Notes was 3.15%. The calculations to derive this figure are shown below.

Figure 6. Commercial Paper "All-In" Interest Rates Including Transaction Costs

Quarter	Interest Expense	All Transaction Costs	"All-In" Expense Total	Average CP Balance	Annualized "All-In" Interest Rate
4th Quarter CY2003 (11/13 – 12/31/03)	$20,416	$27,950	$48,366	$16,032,609	1.21%
1st Quarter CY2004	$36,685	$201,950	$238,635	$25,000,000	3.82%
2nd Quarter CY2004	$83,671	$165,817	$249,488	$25,000,000	3.99%
3rd Quarter CY2004	$48,975	$133,214	$182,190	$36,413,043	2.00%
4th Quarter CY2004	$93,814	$140,377	$234,191	$50,000,000	1.87%
1st Quarter CY2005	$278,077	$132,151	$410,228	$62,600,000	2.62%
2nd Quarter CY2005	$391,087	$186,213	$577,301	$80,000,000	2.89%
rd Quarter CY2005	$578,663	$74,445	$653,108	$81,413,043	3.21%
4th Quarter CY2005	$600,825	$120,175	$721,000	$102,021,739	2.83%
1st Quarter CY2006	$1,269,629	$132,807	$1,402,436	$120,000,000	4.67%
	Average Per Quarter		$471,694		
	Annual Average		**$1,886,776**	**$59,848,043**	**3.15%**

The average annualized Commercial Paper interest rates by quarter can be skewed by the timing of interest payments and transaction cost payments. But we believe that the 3.15% average annual Commercial Paper interest rate over the period from November 2003 to March 2006 provides a fair representation of the "all-in" interest expense associated with the Commercial Paper program.

All-In True Interest Cost for Hypothetical Bond Issues

Using actual interest rate "scales" (i.e. interest rates for principal maturities ranging from one year to 30 years) that were prevailing in November 2003 and February 2005 for California "AAA" insured bonds, we have estimated the TIC associated with the two hypothetical Bond Scenarios that could have been used to provide $120 Million in financing proceeds for the WSIP.

TIC For Bond Scenario 1:

- TIC for November 2003 $132.8 Million Bond Issue: 4.67%

TIC For Bond Scenario 2:

- TIC for November 2003 $55.46 Million Bond Issue: 4.69%
- TIC for February 2005 $72.325 Million Bond Issue: 4.23%

There are at least two reasons why the TIC's on the hypothetical November 2003 bonds is significantly higher than the hypothetical 2005 bonds:

- Although short-term interest rates were lower in 2003 than in 2005, longer term interest rates (e.g. for 15 to 30 year principal maturities) were significantly higher in 2003 than in 2005, which helped to push up the TIC on the 2003 bonds. For example, the interest rate on a principal payment occurring in year 15 was 4.35% in 2003 vs. 4.0% in 2005. Similarly, the interest rate on a year 30 maturity was 4.90% in 2003 vs. 4.45% in 2005.
- The 2003 bonds have significantly more capitalized interest, which tends to increase the TIC.

For comparison, the TIC on the PUC's actual 2006 Series A Bonds was 4.45%.

While the all-in interest rate associated with the PUC's Commercial Paper notes is lower than the TIC's associated with the hypothetical 2003 and 2005 bond issues, this is not an "apples to apples" comparison, because it compares a short-term interest rate against rates for bonds with maturities of up to 30 years. Under most market conditions, a short-term interest rate will be lower than a long-term rate.

A preferable method of comparing the costs associated with Commercial Paper and revenue bonds is to: 1) Incorporate the fact that the PUC "took out" its Commercial Paper with a long-term bond issue into the analysis of the use of Commercial Paper; and 2) Use a method to translate the debt service payments associated with each alternative into today's dollars.

C. Comparison of Present Value of Debt Service Expenses

In the finance industry, the standard method of comparing payments that occur over time, which in this case is debt service payments, is to calculate the "present value" of each series of payments in today's dollars. In this case, we are determining which set of options provides the lower present value (in 2006 dollars) for its stream of debt service payment. While the present value figures themselves are not that meaningful to most readers, they provide an easy way to determine which scenario is preferable. In this case, the scenario that generates the lowest present value amount is better, because it represents the more cost-effective method of financing the $120 Million in WSIP expenses.

One key factor in present value analysis is the selection of the "discount rate" that is used to translate future dollar amounts into today's dollars. The standard practice in the public finance industry is to use the True Interest Cost associated with a bond issue as the discount rate for present value analyses, because the TIC represents the "real cost of money" for a long-term debt issuer. We have used the TIC from the PUC's 2006 Series A bonds of 4.45% as the discount rate in our analysis.

The table below summarizes the results of our analysis. We determined that the present value of the debt service payments associated with the "Commercial Paper Scenario," which represents the use of Commercial Paper from 2003 – 2006, followed by the refinancing of Commercial Paper with long-term bonds in 2006, was less expensive on a

present value basis than either "Bond Scenario 1", which calls for a single hypothetical revenue bond issue, or "Bond Scenario 2," which calls for two hypothetical revenue bond issues.

Figure 7. Present Value of Debt Service Payments for WSIP Financing Scenarios

Comparison of Scenarios	**Present Value in 2006 Dollars of Debt Service Expenses [1 and 2]**
Commercial Paper Scenario: CP + "Take Out"	
A. CP Interest & Expenses Before Refinancing	$4,915,675
B. 2006 CP Take Out (pro-rated portion of PUC's 2006 Series A Bonds)	$123,257,338
Total - CP + Take Out	$128,173,013
Bond Scenario 1 – 2003 Hypothetical Bond Issue	
Hypothetical 2003	$151,984,020
Total – Hypothetical Bonds Scenario 1	$151,984,020
Bond Scenario 2 – 2003 & 2005 Hypothetical Bond Issue	
A. Hypothetical 2003	$63,471,877
B. Hypothetical 2005	$71, 802,996
Total - Hypothetical Bonds Scenario 2	$135,274,873
Present Value Savings From Commercial Paper Scenario Vs. Bond Scenario 1	$23,811,007
Present Value Savings From Commercial Paper Scenario Vs. Bond Scenario 2	$7,101,860

[1] Discount Rate = 4.45%, the actual TIC on PUC's 2006 Series A Bonds
[2] Formula for Present Value = sum of (each annual debt service payment)/(1+ discount rate)^(year in which debt service payment is made - 2006). For those payments occurring before 2006, the analysis inflates those payments into 2006 dollars, rather than discounting them.

Rationale for Use of Commercial Paper in Construction Financing

The previous sections focused on the cost-effectiveness of Commercial Paper. This section focuses on the broader rationale for using Commercial Paper as part of a larger financing strategy for a construction program. Like virtually every public agency, the PUC lacks the cash resources to finance a program of the magnitude of the WSIP on a "pay as you go" basis. As a result, the PUC is financing the WSIP using various forms of debt financing, where debt is issued to investors, who receive periodic payments of principal and interest from the PUC over the life of the debt. As noted above, Commercial Paper is a short-term financing instrument. Because it has a very short maturity compared to a 20 or 30-year bond, the interest rates charged on Commercial Paper Notes are usually significantly lower than the rates for long-term bonds, although the difference between these rates varies based on market conditions.

For public agencies embarking on large construction programs that face uncertainty concerning the timing of their construction cash flow requirements – the situation that has faced PUC in connection with the WSIP – Commercial Paper offers much greater flexibility than a long-term bond issue, along with lower interest rates. Commercial Paper allows an issuer to obtain funds as they are needed, in whatever amounts and with whatever frequency is necessary, rather than relying on a bond issue that takes months to prepare and implement, and may leave the issuer with either more or less bond proceeds than it needs to meet its near-term cash flow requirements.

In this context, Commercial Paper is typically used as a form of "interim financing," to be refinanced at a later date with long-term bonds. This is the approach that the PUC has adopted.

Why Not Use Commercial Paper for All WSIP Financings?

A reasonable follow-up question is – if Commercial Paper is more flexible, and its interest rates are low, should PUC use only Commercial Paper to finance the WSIP over the next 30 or more years? There are many public agencies that use Commercial Paper, or other forms of "variable rate" debt, to finance a portion of their capital programs. In fact, PUC's current WSIP financing strategy calls for the use of a combination of long-term fixed rate and variable rate debt. However, there are at least two reasons why PUC should not rely solely Commercial Paper to finance the WSIP:

- Ongoing Availability of Letter of Credit. As discussed above, the PUC needs to have a Letter of Credit to support its Commercial Paper program, in order to receive an investment grade rating. Typically, the term of a Letter of Credit is anywhere from one to five years, which works well for an interim financing tool. But every Commercial Paper issuer faces the risk that at some point, it will not be able to obtain a new Letter of Credit (or not at an acceptable cost), perhaps due to changes in the letter of credit market (e.g. banks withdrawing from the market to pursue other lines of business). So it would not be prudent for PUC to plan on having uninterrupted access to the Commercial Paper market for the next 30 or more years.

- Future Course of Interest Rates. While current Commercial Paper interest rates are lower than current long-term interest rates, no one can predict with certainty where interest rates will go in the future, and there is no guarantee

that Commercial Paper interest rates in 5 or 10 years from now will be lower than current long-term interest rates.

So the strategy that many public agencies adopt is to use Commercial Paper as an interim financing tool, and then lock-in current long-term interest rates as part of a "take out" financing of Commercial Paper. This is what PUC did in March 2006 with the 2006 Series A Bonds.

Overall Assessment of WSIP Financing Strategy to Date

Based on the analysis presented above, our assessment is that the PUC's financing strategy to date has been prudent. As noted below, we recommend that the RBOC learn more about the financing strategy alternatives that are available going forward, and PUC's long-term WSIP financing strategy, as one of its future topics of inquiry.

Task 2 – WSIP Project Summaries

Task 2 asked us to develop a worksheet that summarized the following information:

- List of WSIP Projects, organized by Sub-Region, in accordance with the WSIP adopted by the Public Utilities Commission on November 29, 2005;
- A brief description of each project, which we have summarized from the more detailed descriptions in the "Water System Improvement Program Report" dated January 2006;
- The amount that was spent from Commercial Paper proceeds for each project to March 1, 2006, which was 15 days prior to the refunding of currently outstanding Commercial Paper with the proceeds of the 2006 Series A Revenue Bonds;
- The Project Budget as approved by the PUC on November 29, 2005; and
- The start date and estimated completion date for each project, as shown in the "Water System Improvement Program Report" dated January 2006.

This information is shown in the following table. In order to fit the table into the format of this Report, it has been divided into two parts.

Figure 8. WSIP Project Descriptions

Project Title [1]	Project No.	Project Description [2]
San Joaquin Sub Regional Program		
Tesla Portal Disinfection Station	CUW38701	Replace seismically-deficient chlorination facility where SJPLs meet Coast Range Tunnel - primary Hetch Hetchy disinfection
Lawrence Livermore Supply Improvement	CUW36401	Provide potable water to Livermore Lab from Coast Range Tunnel Thomas & Mocho shafts
SJPL System, Alternative A	CUW37301	Upgrade SJPL capacity from current 290 mgd to 313 mgd; replace pre-stressed concrete portion of SPJL #3
SJPL System, Rehab of Existing	CUW37302	Replace 6 miles of SJPL #3 constructed of pre-stressed concrete pipe; construct new 9.7 miles SJPL #4 and 2 crossovers
Advanced Disinfection	CUW38401	Hetch Hetchy secondary disinfection facility to comply w/U.S. EPA Long-Term 2 Enhanced Surface Water Treatment Rule
Subtotal - San Joaquin Projects		
Sunol Valley Sub Regional Program		
SVWTP New Treated Water Reservoir	CUW38201	Construct storage basins & related facilities north of Sunol Water Treatment Plant per CA Dept of Health Services order
Calaveras Dam Replacement	CUW37401	New dam downstream from existing seismically-deficient dam with same 96,850 acre-ft. capacity + related improvements
Irvington Tunnel	CUW35901	Improve seismic reliability by adding a second tunnel and new portals to connect with Alameda Siphon & BDPLs
Alameda Siphons Upgrade	CUW35902	Construct seismically-resistant 4th siphon to supplement 3 existing Alameda Siphons
Additional 40 Mgd Treated Water Supply	CUW38101	Increase Sunol Valley Treatment Plant capacity from 120 mgd to 160 mgd
San Antonio Pump Station Upgrade	CUW38601	Replace 3 electric pumps and full backup power to maintain 160 mgd sustained pump capacity + building seismic upgrade
Pipeline Repair & Readiness Improvements	CUW37001	Stage pipe and related supplies to improve seismic emergency repair capabilities for Coast Range Tunnel
Standby Power Facilities - various locations	CUW35501	Install diesel or propane generators at 6 critical facilities to permit them to operate during power outages/emergencies
Alameda Creek Fishery Enhancement	CUW35201	Water release & recapture alternatives from Calaveras are under review - project funds to be used for selected alternative
Subtotal - Sunol Valley Projects		
Bay Division Sub Regional Program		
BDPL Nos. 3 & 4 Crossover/Isolation Valves	CUW35301	Address seismic vulnerability via new shutoff and crossover facilities on each side of Hayward Fault ~ 1 mile apart
Seismic Improvements of BDPL Nos. 3 & 4	CUW35302	Construct seismically resistant pipelines between the two new shutoff & crossover facilities
Bay Division Pipeline Reliability	CUW36801	Add a 5th 21-mile long pipeline from Irvington Tunnel portal to Pulgas Tunnel portal
BDPL No. 4 Slipline PCCP Condition Assessment	CUW39301	Detailed condition assessment (seismic and overall life expectancy) for a 8.6 mile section and an 8 mile section of BDPL 4
SFPUC/EBMUD Intertie	CUW38901	Intertie to allow 30 mgd flow either way between SFPUC & EBMUD in event of shutdown due to emergency or repairs
Installation of SCADA - Phase II	CUW36301	Allow remote monitoring & control of facilities (needs assessment underway) + security components at 14 sites
BDPL Nos. 3 & 4 Crossovers	CUW38001	3 new crossovers between Irvington Tunnel and Pulgas Tunnel to allow flow to move between BDL pipelines during outages
Subtotal - Bay Division Projects		
Peninsula Sub Regional Program		
Cross Connection Controls	CUW36501	Per CA Dept of Health reg., prevent untreated water entering treated water system via valve/piping replacement at 300 sites
Pulgas Balancing Reservoir Rehabilitation	CUW36101	Modifications to inlet/outlet piping to improve water quality; condition assess. of discharge channel & geotechnical assessment
Crystal Springs/San Andreas Transmission Upgrade	CUW37101	Seismic & hydraulic upgrades to supply 140 mgd from Upper Crystal Springs Reservoir to Harry Tracy WTP
Capuchino Valve Lot Improvements	CUW36901	Relocate and upgrade pressure-reducing station that allows flow from high pressure to low pressure supply pipeline

Project Title [1]	Project No.	Project Description [2]
Baden and San Pedro Valve Lot Improvements	CUW39101	Evaluate & upgrade facilities to current seismic standards – budget assumes certain level of improvements pending evaluation
Harry Tracy WTP – Short-Term Improvements	CUW36601	Seismic and other improvements to reliably operate at 120 mgd sustained flow during normal raw water quality conditions
Harry Tracy WTP – Long-Term Improvements	CUW36701	Expand seismically reliable maximum capacity from 120 mgd to 140 mgd for 60 days under all raw water quality conditions
New Crystal Springs Bypass Tunnel	CUW35601	4200 foot tunnel to increase reliability/ redundancy between Hetch Hetchy supply & Peninsula
Adit Leak Repair – Crystal Springs/Calaveras	CUW35701	Repair adit (outlet facilities containing valves/piping) at Crystal Springs and Calaveras reservoirs damaged by leakage
Lower Crystal Springs Dam Improvements	CUW35401	Increase spillway capacity to accommodate probable maximum flood and repair general deterioration
Subtotal – Peninsula Projects		
San Francisco Sub Regional Program		
Sunset Reservoir	CUW35801	Seismically upgrade reservoir roof, embankment stabilization and other improvements
Crystal Springs Pipeline #2 – Replacement	CUW37801	Repair ~ 9 miles of CSPL No. 2 and replace ~ 6-7 miles of pipeline from Crystal Springs to University Mound Reservoir
San Andreas Pipeline #3 Installation	CUW37901	Replace Baden-Merced pipeline (out of service, beyond repair) with pipeline from HTWTP to San Pedro Valve Lot
University Mound Reservoir – North Basin	CUW37201	Seismic upgrades, structural upgrades, replacement of liner; general rehabilitation
Groundwater Projects	CUW30101	Ph. A: raise Lake Merced level; Ph. B: wells for 4 mgd of local groundwater; Ph. C: wells for 7 mgd of regional groundwater
Recycled Water Project	CUW30201	Ph. A: Westside tertiary treatment for 2.8-4.7 mgd; Ph. B: treatment for 1.9 mgd to irrigate Harding Park/Lake Merced
Bay Area Desalination	CUW39001	Funding for participation in regional desalination development – feasibility report expected by June 2006
Subtotal – San Francisco Projects		
Systemwide Program		
Programmatic EIR	CUW38801	Development of Environmental Impact Report designed to address system-wide environmental impacts of WSIP
Program Management Project - WSIP	CUW39201	Program, project and pre-construction management services (Parsons Water Infrastructure & CH2M Hill)
Watershed Management Land Acquisition	TBD	Conservation easements, fee title, public-private partnerships on land within Alameda Creek, Peninsula and Tuolumne watersheds
Subtotal – Systemwide Program		
San Francisco Local Program		
All Other Local Projects	Various	Various
Bond/Commercial Paper Financing Costs	CUW300	Costs associated with debt used to finance WSIP, including interest expenses and transaction expenses

Notes:
[1] From WSIP adopted by PUC on November 29, 2005. Projects organized by sub-region and listed in the order shown on WSIP Program Cost Worksheet (Appendix B of January 2006 WSIP Report).
[2] Summarized from project descriptions in Section 2.0 of Water System Improvement Report dated January 2006.

Figure 9.
WSIP Project Budgets, Commercial Paper Expenditures,
Start & End Dates

Project Title	Commercial Paper Proceeds Spent As Of March 1, 2006 [3A,3B, 3C]	Project Budget November 2005 [4]	Project Start [4]	Scheduled Completion [4]
San Joaquin Sub Regional Program				
Tesla Portal Disinfection Station	$249,711	$20,731,269	3/18/2002	9/2/2011
Lawrence Livermore Supply Improvement	$132,409	$4,235,257	2/2/2004	11/7/2011
SJPL System, Alternative A	$5,055,570	$352,732,000	8/19/2002	6/30/2014
SJPL System, Rehab of Existing	$0	$80,000,000	see above	see above
Advanced Disinfection	$440,174	$101,643,000	7/1/2002	7/1/2011
Subtotal – San Joaquin Projects	**$5,877,864**	**$559,341,526**		
Sunol Valley Sub Regional Program				
SVWTP New Treated Water Reservoir	$3,261,093	$102,436,435	9/15/2003	10/21/2010
Calaveras Dam Replacement	$9,047,677	$265,928,502	9/3/2002	6/29/2012
Irvington Tunnel	$4,056,982	$214,650,000	12/19/2001	9/17/2013
Alameda Siphons Upgrade	$0	$78,577,000	12/19/2001 [5]	4/14/2011 [5]
Additional 40 Mgd Treated Water Supply	$75,428	$133,108,000	4/22/2005	7/9/2013
San Antonio Pump Station Upgrade	$210,543	$41,854,000	7/1/2004	12/12/2011
Pipeline Repair & Readiness Improvements	$647,099	$5,591,770	4/21/2003	3/30/2007
Standby Power Facilities - various locations	$549,025	$9,949,736	7/11/2002	12/6/2010
Alameda Creek Fishery Enhancement	$655,378	$18,809,304	9/30/2003	5/25/2012
Subtotal - Sunol Valley Projects	**$18,503,225**	**$870,904,747**		
Bay Division Sub Regional Program				
BDPL Nos. 3 & 4 Crossover/Isolation Valves	Included in expenditures for Seismic Improvements to BDPL Nos. 3 & 4	$27,600,159	2/17/2004	4/24/2013
Seismic Improvements of BDPL Nos. 3 & 4	$4,718,410	$66,792,849	1/6/2003	10/15/2012
Bay Division Pipeline Reliability	$4,453,970	$572,022,638	12/19/2001	1/31/2014
BDPL No. 4 Slipline PCCP Condition Assessment	$0	$2,000,000	11/6/2006	5/1/2008
SFPUC/EBMUD Intertie	$6,666,084	$8,598,851	6/24/2002	2/7/2007
Installation of SCADA - Phase II	$64,431	$36,099,000	4/22/2005	2/24/2012
BDPL Nos. 3 & 4 Crossovers	$796,045	$36,616,911	2/17/2004	4/24/2013
Subtotal - Bay Division Projects	**$16,698,940**	**$749,730,408**		

Project Title	Commercial Paper Proceeds Spent As Of March 1, 2006 [3A,3B, 3C]	Project Budget November 2005 [4]	Project Start [4]	Scheduled Completion [4]
Peninsula Sub Regional Program				
Cross Connection Controls	$1,149,539	$6,111,780	7/1/2003	5/15/2009
Pulgas Balancing Reservoir Rehabilitation	$1,454,282	$46,491,724	5/15/2002	8/5/2013
Crystal Springs/San Andreas Transmission Upgrade	$2,158,142	$148,582,654	8/18/2003	4/1/2014
Capuchino Valve Lot Improvements	$156,758	$3,573,782	4/22/2005	7/24/2009
Baden and San Pedro Valve Lot Improvements	$59,409	$47,320,000	10/3/2005	10/12/2011
Harry Tracy WTP - Short-Term Improvements	$2,603,415	$30,202,363	9/4/2002	9/8/2010
Harry Tracy WTP - Long-Term Improvements	$1,064,497	$167,570,000	7/1/2003	4/8/2014
New Crystal Springs Bypass Tunnel	$3,150,256	$83,222,790	1/7/2002	10/28/2010
Adit Leak Repair - Crystal Springs/Calaveras	$242,772	$3,748,452	4/1/2005	7/3/2008
Lower Crystal Springs Dam Improvements	$924,207	$27,752,223	11/1/2000	8/16/2011
Subtotal - Peninsula Projects	**$12,963,277**	**$564,575,768**		
San Francisco Sub Regional Program				
Sunset Reservoir	$7,536,910	$61,976,000	3/31/2000	5/6/2009
Crystal Springs Pipeline #2 – Replacement	$1,280,529	$93,926,000	1/15/2004	2/27/2012
San Andreas Pipeline #3 Installation	$1,472,154	$42,029,940	1/15/2004	6/9/2011
University Mound Reservoir - North Basin	$50,247	$102,882,611	6/14/2004	11/30/2010
Groundwater Projects	$3,406,899	$69,011,000	6/16/2003	2/27/2014
Recycled Water Project	$1,544,331	$201,626,000	3/3/2003	9/4/2012
Bay Area Desalination	$54,706	$10,000,000	1/6/2003	6/29/2012
Subtotal - San Francisco Sub Regional Program	**$15,345,776**	**$581,451,551**		
Subtotal - Total Regional Programs	**$69,389,082**	**$3,326,004,000**		
Systemwide Program				
Programmatic EIR	$2,995,191	$9,271,000	4/13/2004	6/20/2007
Program Management Project - WSIP	3,158,864	$52,076,000	7/20/2005	9/30/2014
Watershed Management Land Acquisition	$0	$20,000,000	1/2/2007	6/28/2013
Subtotal - Systemwide Program	**$6,154,055**	**$81,347,000**		
San Francisco Local Program				
All Other Local Projects	**$39,011,092**	**$383,202,000**		
Subtotal - San Francisco Retail and Delivery Projects	**$114,554,259**	**$383,202,000**		
Financing Costs	**$4,325,404**	**$633,699,000**		
Grand Total	**$118,879,663**	**$4,392,291,000**		

Notes:

[3A]. Commercial Paper proceeds by project – from PUC Excel worksheet entitled "WSIP FAMIS as of 02 28 06 and 03 31 06." As the file name indicates, PUC provided data from the FAMIS System showing expenditures as of the end of February 2006 and the end of March 2006. We chose to present the data as of the end of February because the refinancing of Commercial Paper with the 2006 Series A bonds occurred on March 15, 2006. As a result, the data through the end of March includes expenditures made from the proceeds of the 2006 Series A bonds. The data through February includes only expenditures from Commercial Paper proceeds.

[3B]. In addition to the $120 Million in Commercial Paper Notes issued, PUC also earned $903,675 in interest income through the investment by the City Treasurer of unspent proceeds through the end of February 2006.

[3C]. Approximately $19.6 million in "pre-Proposition A" funds also have been spent on WSIP projects. These amounts are not shown in this table, but are itemized in Chapter 3.

[4] All project start and end dates from WSIP proposed Program Schedule, Appendix A to WSIP Report dated January 2006, except where noted.

[5] Schedule not separately listed in WSIP Program Schedule, Appendix A, so dates are from December 2005 WSIP Quarterly Report, Phase Level Schedule, Attachment 3.

Task 3 – WSIP Project Budgets, Appropriations & Expenditures

Task 3 summarizes the following information for each WSIP project:

- Initial Project Budgets from the CIP adopted in May 2002;
- Project Budgets from CIP as amended August 2003;
- Current Project Budgets as adopted in November 2005;
- Current Appropriations by project;
- Project expenditures from Commercial Paper proceeds to March 1, 2006; and

Due to its size, this table has been divided into two parts, and is presented below in Figures 10 and 11.

Figure 10. Change in Project Budgets from May 2002 through November 2005

Project Title	Project No.	May 2002 Budget [1]	Change Vs. August 2003	August 2003 Budget [2]	Change Vs. November 2005	November 2005 Budget [3]
San Joaquin Sub Regional Program						
Tesla Portal Disinfection Station	CUW38701	$10,514,000	$121	$10,514,121	$10,217,148	$20,731,269
Lawrence Livermore Supply Improvement	CUW36401	$1,801,000	$13,828	$1,814,828	$2,420,429	$4,235,257
SJPL System, Alternative A	CUW37301	$391,380,000	($345)	$391,379,655	($38,647,655)	$352,732,000
SJPL System, Rehab of Existing Pipelines	CUW37302		$0		$80,000,000	$80,000,000
Advanced Disinfection	CUW38401	$50,645,000	$97,454	$50,742,454	$50,900,546	$101,643,000
Subtotal - San Joaquin Projects		**$454,340,000**	**$111,058**	**$454,451,058**	**$104,890,468**	**$559,341,526**
Sunol Valley Sub Regional Program						
SVWTP New Treated Water Reservoir	CUW38201	$46,978,000	$1,795,215	$48,773,215	$53,663,220	$102,436,435
Calaveras Dam Replacement	CUW37401	$150,000,000	($1,121,997)	$148,878,003	$117,050,499	$265,928,502
Irvington Tunnel	CUW35901	$143,929,000	($222)	$143,928,778	$70,721,222	$214,650,000
Alameda Siphons	CUW35902		N/A	N/A	N/A	$78,577,000
Additional 40 Mgd Treated Water Supply	CUW38101	$81,974,000	$360,044	$82,334,044	$50,773,956	$133,108,000
San Antonio Pump Station Upgrade	CUW38601	$3,686,000	($360)	$3,685,640	$38,168,360	$41,854,000
Pipeline Repair & Readiness Improvements	CUW37001	$3,370,000	$862,000	$4,232,000	$1,359,770	$5,591,770
Standby Power Facilities - various locations	CUW35501	$5,499,000	$77,790	$5,576,790	$4,372,946	$9,949,736
Alameda Creek Fishery Enhancement [8]	CUW35201	$6,731,000	($417,328)	$6,313,672	$12,495,632	$18,809,304
Subtotal - Sunol Valley Projects		**$442,167,000**	**$1,555,142**	**$443,722,142**	**$348,605,605**	**$870,904,747**
Bay Division Sub Regional Program						
BDPL Nos. 3 & 4 Crossover/Isolation Valves	CUW35301	N/A	N/A	N/A	N/A	$27,600,159
Seismic Improvements of BDPL Nos. 3 & 4	CUW35302	$42,003,000	$200,012	$42,203,012	$24,589,837	$66,792,849
Bay Division Pipeline Reliability	CUW36801	$248,970,000	$49,882,805	$251,323,805	$320,698,833	$572,022,638
BDPL No. 4 Slipline PCCP Assessment	CUW39301	N/A	N/A	N/A	N/A	$2,000,000
SFPUC/EBMUD Intertie	CUW38901	N/A	N/A	$9,800,000	N/A	$8,598,851
Installation of SCADA - Phase II	CUW36301	$28,713,000	$137	$28,713,137	$7,385,863	$36,099,000
BDPL Nos. 3 & 4 Crossover	CUW38001	$10,972,000	($141)	$10,971,859	$25,645,052	$36,616,911
Subtotal - Bay Division Projects		**$283,129,000**	**$50,082,813**	**$343,011,813**	**$378,319,585**	**$749,730,408**

Project Title	Project No.	May 2002 Budget [1]	Change Vs. August 2003	August 2003 Budget [2]	Change Vs. November 2005	November 2005 Budget [3]
Peninsula Sub Regional Program						
Cross Connection Controls	CUW36501	$3,895,000	$382,491	$4,277,491	$1,834,289	$6,111,780
Pulgas Balancing Reservoir Rehabilitation	CUW36101	$15,776,000	$300,324	$16,076,324	$30,415,400	$46,491,724
Crystal Springs/San Andreas Transmission Upgrade	CUW37101	$58,170,000	$150,947	$58,320,947	$90,261,707	$148,582,654
Capuchino Valve Lot Improvements	CUW36901	$1,663,000	$1,210	$1,664,210	$1,909,572	$3,573,782
Baden and San Pedro Valve Lot Improvements	CUW39101	N/A	N/A	N/A	N/A	$47,320,000
HTWTP - Short Term Improvements	CUW36601	$2,997,000	$11,593,000	$14,590,000	$15,612,363	$30,202,363
HTWTP - Long Term Improvements	CUW36701	$37,392,000	($4,335)	$37,387,665	$130,182,335	$167,570,000
New Crystal Springs Bypass Tunnel	CUW35601	$49,484,000	$2,396,542	$51,880,542	$31,342,248	$83,222,790
Adit Leak Repair - Crystal Springs/Calaveras	CUW35701	$2,195,000	($182)	$2,194,818	$1,553,634	$3,748,452
Lower Crystal Springs Dam Improvements	CUW35401	$16,889,000	$1,292,718	$18,181,718	$9,570,505	$27,752,223
Subtotal - Peninsula Projects		**$188,461,000**	**$16,112,715**	**$204,573,715**	**$312,682,053**	**$564,575,768**
San Francisco Sub Regional Program						
Sunset Reservoir	CUW35801	$44,853,501	$0	$44,853,501	$17,122,499	$61,976,000
Crystal Springs Pipeline #2 - Replacement	CUW37801	$2,070,000	$401	$2,070,401	$91,855,599	$93,926,000
San Andreas Pipeline #3 Installation	CUW37901	$25,328,100	$0	$25,328,100	$16,701,840	$42,029,940
University Mound Reservoir - North Basin	CUW37201	$64,512,804	$0	$64,512,804	$38,369,807	$102,882,611
Groundwater Projects	CUW30101	$13,706,000	($247)	$13,705,753	$55,305,247	$69,011,000
Recycled Water Project	CUW30201	$102,735,000	$7,120,304	$109,855,304	$91,770,696	$201,626,000
Bay Area Desalination	CUW39001	N/A	N/A	$650,000	$9,350,000	$10,000,000
Subtotal - San Francisco Regional Projects		**$253,205,405**	**$7,120,458**	**$260,975,863**	**$320,475,688**	**$581,451,551**
Subtotal - Total Regional Programs		**$1,621,302,405**	**$85,432,186**	**$1,706,734,591**	**$1,619,269,409**	**$3,326,004,000**

Project Title	Project No.	May 2002 Budget [1]	Change Vs. August 2003	August 2003 Budget [2]	Change Vs. November 2005	November 2005 Budget [3]
Systemwide Program						
Programmatic EIR	CUW38801	$0	$0	$0	$9,271,000	$9,271,000
Program Management Project - WSIP	CUW39201	$0	$0	$0	$52,076,000	$52,076,000
Watershed Management Land Acquisition	TBD	$0	$0	$0	$20,000,000	$20,000,000
Subtotal - Systemwide Program		**$0**	$0	**$0**	$81,347,000	**$81,347,000**
All - San Francisco Local Projects		**$301,410,000**	**($7,191,062)**	**$294,218,938**	$88,983,062	**$383,202,000**
Totals Excluding Financing Costs		**$1,922,712,405**	**$78,241,124**	**$2,000,953,529**	**$1,789,599,471**	**$3,790,553,000**

Notes:
[1] From Capital Improvement Program approved by PUC on May 28, 2002, Appendix CIP-2. Costs shown in 2003 dollars exclude a total of $481 million in cost escalation to year of construction.
[2] From "Capital Improvement Program Status Report and Update 2003" dated August 21, 2003, CIP Appendix 2.
[3] From Water System Improvement Program dated January 2006, Appendix B "Program Cost Worksheet." Project budget includes construction, land/right of way acquisition, and project delivery costs (e.g. design, program management, department and agency costs, etc…).

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Figure 11. WSIP Project Budgets, Appropriations, And Expenditures As Of March 1, 2006

Project Title	Project No.	Current Project Budget [November 2005]	Total Appropriations As Of March 1, 2006 [4]	Commercial Paper & Bond Proceeds Expended As Of March 1, 2006 [5]
San Joaquin Sub Regional Program				
Tesla Portal Disinfection Station	CUW38701	$20,731,269	$1,450,000	$249,711
Lawrence Livermore Supply Improvement	CUW36401	$4,235,257	$561,000	$132,409
SJPL System, Alternative A	CUW37301	$352,732,000	$8,351,000	$5,055,570
SJPL System, Rehab of Existing Pipelines	CUW37302	$80,000,000	$0	$0
Advanced Disinfection	CUW38401	$101,643,000	$2,540,000	$440,174
Subtotal - San Joaquin Projects		**$559,341,526**	$12,902,000	$5,877,864
Sunol Valley Sub Regional Program				
SVWTP New Treated Water Reservoir	CUW38201	$102,436,435	$4,566,266	$3,261,093
Calaveras Dam Replacement	CUW37401	$265,928,502	$14,959,000	$9,047,677
Irvington Tunnel	CUW35901	$214,650,000	$10,099,000	$4,056,982
Alameda Siphons	CUW35902	$78,577,000	$0	$0
Additional 40 Mgd Treated Water Supply	CUW38101	$133,108,000	$1,923,000	$75,428
San Antonio Pump Station Upgrade	CUW38601	$41,854,000	$480,000	$210,543
Pipeline Repair & Readiness Improvements	CUW37001	$5,591,770	$3,236,000	$647,099
Standby Power Facilities - various locations	CUW35501	$9,949,736	$1,372,000	$549,025
Alameda Creek Fishery Enhancement [8]	CUW35201	$18,809,304	$672,000	$655,378
Subtotal - Sunol Valley Projects		**$870,904,747**	$37,307,266	$18,503,225
Bay Division Sub Regional Program				
BDPL Nos. 3 & 4 Crossover/Isolation Valves	CUW35301	$27,600,159	$23,407,000	$4,718,410
Seismic Improvements of BDPL Nos. 3 & 4	CUW35302	$66,792,849	Included in 35301	Included in 35301
Bay Division Pipeline Reliability	CUW36801	$572,022,638	$16,996,000	$4,453,970
BDPL No. 4 Slipline PCCP Cond Assessment	CUW39301	$2,000,000	$0	
SFPUC/EBMUD Intertie	CUW38901	$8,598,851	$8,400,000	$6,666,084
Installation of SCADA - Phase II	CUW36301	$36,099,000	$1,290,000	$64,431
BDPL Nos. 3 & 4 Crossover	CUW38001	$36,616,911	$1,804,000	$796,045
Subtotal – Bay Division Projects		**$749,730,408**	$51,897,000	$16,698,940
Peninsula Sub Regional Program				
Cross Connection Controls	CUW36501	$6,111,780	$2,550,000	$1,149,539
Pulgas Balancing Reservoir Rehabilitation	CUW36101	$46,491,724	$2,443,000	$1,454,282
Crystal Springs/San Andreas Transmission Upgrade	CUW37101	$148,582,654	$4,930,000	$2,158,142

Project Title	Project No.	Current Project Budget [November 2005]	Total Appropriations As Of March 1, 2006 [4]	Commercial Paper & Bond Proceeds Expended As Of March 1, 2006 [5]
Capuchino Valve Lot Improvements	CUW36901	$3,573,782	$452,000	$156,758
Baden and San Pedro Valve Lot Improvements	CUW39101	$47,320,000	$854,000	$59,409
HTWTP - Short Term Improvements	CUW36601	$30,202,363	$3,035,000	$2,603,415
HTWTP - Long Term Improvements	CUW36701	$167,570,000	$1,165,000	$1,064,497
New Crystal Springs Bypass Tunnel	CUW35601	$83,222,790	$6,422,000	$3,150,256
Adit Leak Repair - Crystal Springs/Calaveras	CUW35701	$3,748,452	$3,057,000	$242,772
Lower Crystal Springs Dam Improvements	CUW35401	$27,752,223	$1,748,000	$924,207
Subtotal - Peninsula Projects		**$564,575,768**	$26,656,000	$12,963,277
San Francisco Sub Regional Program				
Sunset Reservoir	CUW35801	$61,976,000	$30,842,000	$7,536,910
Crystal Springs Pipeline #2 – Replacement	CUW37801	$93,926,000	$3,447,000	$1,280,529
San Andreas Pipeline #3 Installation	CUW37901	$42,029,940	$3,789,000	$1,472,154
University Mound Reservoir – North Basin	CUW37201	$102,882,611	$265,000	$50,247
Groundwater Projects	CUW30101	$69,011,000	$7,630,000	$3,406,899
Recycled Water Project	CUW30201	$201,626,000	$9,862,000	$1,544,331
Bay Area Desalination	CUW39001	$10,000,000	$400,000	$54,706
Subtotal - San Francisco Projects		**$581,451,551**	$56,235,000	$15,345,776
Subtotal - Total Regional Programs		**$3,326,004,000**	$184,997,266	**$69,389,082**
Systemwide Program				
Programmatic EIR	CUW38801	$9,271,000	$4,585,734	$2,995,191
Program Management Project - WSIP	CUW39201	$52,076,000	$7,789,188	$3,158,864
Watershed Management Land Acquisition	TBD	$20,000,000	$0	$0
Subtotal - Systemwide Program		**$81,347,000**	$12,374,922	$6,154,055
All - San Francisco Local Projects		**$383,202,000**	$46,243,981	$39,011,092
Financing Costs		**$633,699,000**		**$4,325,404**
Grand Total		**$4,392,291,000**	**$238,436,088**	**$118,879,663**

Notes:

[4] Source: PUC Worksheet entitled "WSIP Spending Plan as of December 2005."
[5] Source: PUC Worksheet entitled "WSIP FAMIS as of 02 28 06 and 03 31 06."

The Task 3 document draws on data from several different sources, including the 2002 CIP, and 2003 CIP Update, and supplemental worksheets provided by the PUC. These tables serve two purposes:

- They summarizes changes to project budgets across the three iterations of the WSIP from 2002 through 2005; and
- They display project budgets, appropriations, and expenditures in a summary format.

Summarizing project budgets, appropriations and expenditures in a table such as the one displayed in Figure 11 can provide a useful high-level management tool, particularly since PUC staff must return to the Commission and Board of Supervisors periodically to request increases in appropriations amounts for WSIP projects.

- Based on discussions with PUC staff, depending upon the audience, it may make sense to either add a new column to Figure 11 that also shows how much money is "encumbered" (i.e. designated in the City's FAMIS accounting system for payment for a particular purpose, such as a specific contract) for each project, or to remove the column on current appropriations entirely. From the RBOC's perspective, we would recommend including the data on encumbrances.

Recommendations from Task 3

We recommend that:

- The RBOC request updates of table shown in Figure 11 at least quarterly, so that they can track the status of appropriations and expenditures at the project level;
- The PUC incorporate a similar table into their WSIP Quarterly Updates; and
- PUC staff provides a similar table to PUC senior management on a monthly basis, in order to facilitate tracking the status of WSIP appropriations vs. expenditures.

Task 5 – Potential Recategorization of Expenses to Proposition A Funds

Task 5 asked us to determine if there are any projects and/or employees that were not paid from the Commercial Paper program, but which SFPUC plans to transfer to the WSIP and pay thereafter from revenue bond proceeds, and if so, to determine if part or all of their past salaries and past-project costs will be capitalized and paid out of revenue bonds. Our understanding is that PUC staff had previously indicated to the RBOC that expenses associated with City Planning's efforts on the Programmatic EIR, as well as other possible expenses incurred by other City Departments in support of the WSIP, could be transferred to Proposition A bonds in the future.

- Based on our discussions with PUC staff, these types of expenses are already being charged to the WSIP, so there appears to be no plans to "transfer" expenses from the operating budget to the WSIP (Proposition A bond funds) at a later date.

The November 2005 WSIP has a budget category known as "Department and Agency Costs," which is intended to pay for the costs of PUC staff, and the time of staff from other City Departments who are supporting aspects of the WSIP, using Proposition A bond funds. The WSIP budget for this category of expenses totals to $25.1 million. The City Departments that are likely to support aspects of the WSIP include:

- City Planning
- City Attorney
- Human Resources
- Human Rights Commission
- Department of Public Works
- Department of Parking & Traffic
- Department of Telecommunications and Information Services

Our understanding is that the $25.1 million budget for Department and Agency costs has not been broken down into specific amounts for each City Department. Instead, approximately $3.6 million per year has been budgeted per year (not escalated) over the life of the program.

Particularly during periods of fiscal difficulties, General Fund Departments may seek opportunities to increase the amount of funding that they receive from the WSIP, in order to support their ongoing operations. PUC staff is responsible for ensuring that only those charges that are truly necessary to support the WSIP are paid from WSIP funds.

With the exception of the Department of Human Resources, our understanding is that all departments that are charging to the WSIP are tracking the time of each employee that is working on WSIP-related matters, and invoicing PUC based on those time records. As of June 1, 2006, we have not obtained information regarding how these types of expenses are actually being recorded and allocated to projects. The RBOC may wish to learn more about this topic as part of its follow-on examination of the WSIP.

With regard to City Planning's Major Environmental Analysis Division, based on discussions with PUC staff, our understanding is that three to four full-time equivalent employees, who had been City Planning employees, have been transferred to PUC's payroll to work full time on the Programmatic EIR. Their expenses are already covered within the WSIP as part of the Department and Agency Costs budget. Other City Planning employees, who work on WSIP-related matters on a part-time basis, remain on the payroll of City Planning, track their time spent on the WSIP, and City Planning invoices PUC for their time on a quarterly basis. These expenses are also charged to the WSIP's Department and Agency Costs budget.

As background, once any expense is charged to the PUC's operating budget, it may only be "recategorized" as bond-funded expense within the same fiscal year in which the expense was originally incurred, because once a fiscal year's books are closed, no recategorization of expenses would be processed by the Controller's Office.

Recommendations From Task 5

- We recommend that expenditures on the services of PUC staff and other City Departments be monitored by the RBOC on an annual or semi-annual basis. RBOC's objective should be to ensure that the PUC continues to keep this issue on their radar screen by periodically reviewing its status.

Chapter 2 – Conclusions

- The table shown in Figure 11 provides a useful summary format for tracking WSIP project budgets, appropriations and expenses. A table such as this one should be included in the WSIP Quarterly Report, updated for the RBOC on at least a quarterly basis, and for PUC management on a monthly basis.

- Based on our discussions with PUC staff, the expenses associated with services of Other City Departments are already being charged to the WSIP. There appears to be no plans to "transfer" expenses from the operating budget to the WSIP (Proposition A bond funds) at a later date.

Chapter 3. Focus on Four Major Projects: 1) Calaveras Reservoir, 2) Bay Division Pipelines, 3) San Joaquin Pipelines, and 4) Irvington Tunnel

For each of the four projects: 1) Calaveras Reservoir, 2) Bay Division Pipelines, 3) San Joaquin Pipelines, and 4) Irvington Tunnel, we were asked to perform the following analyses.

a. Reconcile the initial project budget and the CIP adopted by the PUC in May 2002 and amended in August 2003. Reconcile the current (November 2005) project budget and the current WSIP.

Figure 12 presents the changes in the budgets for the Calaveras, Bay Division Pipeline, San Joaquin Pipeline, and Irvington Tunnel projects as "stand alone" projects, as they are presented in the various iterations of the CIP's adopted by the PUC. However, please note that:

- In the case of the San Joaquin Pipeline project, the November 2005 WSIP added "Rehabilitation of Existing SJPL System" (CUW37302) as a new project. The additional cost associated with the Alameda Siphons #4 project is included in the discussion of the Irvington Tunnel project in Figure 15.

- In the case of the Irvington Tunnel project, the November 2005 WSIP added "Alameda Siphons #4" (CUW35902) as a new project, rather than simply upgrading the existing three siphons, as had been called for in the previous version of the Irvington scope. The additional cost associated with the Alameda Siphons #4 project is included in the discussion of the Irvington Tunnel project in Figure 14.

Figure 12. Change in Calaveras, BDPL, SJPL and Irvington Project Budgets From 2002 – 2005

($ in Millions)

Project	May 2002 Budget	Change From May 2002 to August 2003	August 2003 Budget	Change From August 2003 to November 2005	November 2005 Budget
Calaveras	$150.0	($1.1)	$148.9	$117.0	$265.9
Bay Division PL	249.0	2.3	251.3	320.7	572.0
San Joaquin PL [1]	391.4	0.0	391.4	(38.7)	352.7
Irvington Tunnel [2]	143.9	0.0	143.9	70.7	214.6

Notes:
[1] Excludes the cost for the November 2005 WSIP project entitled "Rehabilitation of Existing SJPL System" (CUW37302), which has a project budget of $80 Million. However, in order to create a better "apples to apples" comparison, the cost of the rehabilitation project is included in the discussion of the SJPL project in Figure 15.
[2] Excludes the cost for the November 2005 project entitled "Alameda Siphons #4" (CUW35902), which has a project budget of $78.6 Million. However, in order to create a better "apples to apples" comparison, the cost of the Alameda Siphons project is included in the discussion of the Irvington project in Figure 14.

b. Obtain an explanation of the changes from the initial project budget to the current project budget.

At the June 12, 2006 meeting of the RBOC, the Committee asked us to provide additional information concerning the changes in scope, schedule and cost for the "Big Four" projects from the initial 2002 CIP to the November 2005 WSIP. The Committee asked us to focus on "what" changed in each project from 2002 to 2005, but not to attempt to identify "why' those changes were implemented. Rather than requesting a summary of project changes from PUC staff, we have developed our own summaries for each of these projects, based on:

- The May 2002 Project Summary and Cost Estimate Worksheets for each project;
- The October 2005 Parsons/CH2M Hill report;
- Information generously provided by Steve Lawrence of the PUC's Citizens Advisory Committee; and
- Feedback from PUC staff.

We reviewed our summaries of the changes in these projects with PUC staff, but the summaries are our work product, not the agency's.

Before summarizing these changes for each of the Big Four projects, it is important to note that two major changes in project budgeting were implemented between the 2002 CIP and the November 2005 WSIP regarding: 1) how cost escalation was budgeted; and 2) how the program's "management reserve" was addressed.

Cost Escalation

Typically, construction cost estimates are made in "base year" dollars, and then escalated to the mid-year of construction. In the 2002 CIP, each project was budgeted in 2003 dollars, and then a $481 million program-wide cost escalation line-item was included in the CIP program. By comparison, in the November 2005 WSIP, cost escalation was budgeted at the project-level, so each project starts with a base year construction cost estimate, and then adds on its own budgeted amount for construction cost escalation. The program-wide cost escalation factor has been eliminated.

Management Reserve

A "Management Reserve" is a budgeted amount that is included in a construction program's overall budget that is not allocated to individual projects. This amount is available during the life of a construction program to fund cost increases that are above and beyond the amounts available in an individual project's contingencies.

The 2002 CIP included a separate Management Reserve. "Program contingencies management reserve" totaled to $408 million in the 2002 CIP. As part of the development of the November 2005 WSIP, PUC staff indicates that the Management Reserve was eliminated, and that these funds were distributed at the project-level.

In total, according to PUC staff, the changes in how cost escalation and the management reserve are handled for budgeting purposes have resulted in a 43% increase in individual project budgets, even without any other changes to project scope or schedule. We use this 43% figure for calculations in the tables below.

Format for Tables Summarizing Changes in Big Four Projects

Figure 13 presents the format that we have used to summarize the changes in project scope, schedule and cost for each of the Big Four projects. Figure 13 shows the source of information used, and lays out the calculation methodology used to derive certain of the estimates shown in each table.

Figure 13. Format for Table on Changes In Scope, Schedule And Cost For Big Four Projects

Column 1 **2002 Scope & Year Of Scheduled Completion**	**Column 2** **November 2005 Scope & Year Of Scheduled Completion**	**Column 3** **2002 Cost (Unescalated)**	**Column 4** **Cost Change From Change in Budgeting Escalation and For Management Reserve**	**Column 5** **Estimated Cost Change Due to Scope Change Or Costing Methodology**	**Column 6** **November 2005 Cost Estimate (Escalated)**
Scope: **Scheduled Completion**: Information From 2002 CIP Project Summary and Cost Estimate Worksheets	**Scope**: **Scheduled Completion**: Information From October 2005 Parsons-CH2M Hill report	Information From 2002 CIP Project Summary and Cost Estimate Worksheets	Calculated As = (2002 Cost) x (43%)	Calculated As = (Nov. 2005 Escalated Cost) – (Cost Change From Escalation and Management Reserve) – (2002 Unescalated Cost) or Col. [5] = Col. [6] - Col. [4] - Col. [3]	Information From November 2005 WSIP

Please note that the columns showing cost changes from the change in budgeting for escalation and management reserve (Column 4) and cost changes from scope changes (column 5), represent estimates that we have derived, based on our discussion with the Committee on June 12. The estimated change in cost due to scope changes should be viewed as only very rough approximations.

Also, as indicated above, these project summaries do not address the rationale for any scope change between 2002 and 2005, which the Committee may choose to pursue through its future inquiries.

Figure 14. Irvington Tunnel: 2002 vs. 2005 Scope, Schedule and Cost

2002 Scope & Year Of Scheduled Completion	November 2005 Scope & Year Of Scheduled Completion [Significant Changes From 2002 Scope Are Underlined]	2002 Cost Estimate (2003 Dollars)	Estimated Cost Change From Change in Budgeting Escalation and For Management Reserve	Estimated Cost Change Due to Scope Change	November 2005 Cost Estimate (Escalated)
Scope: Construct new facility to provide sufficient capacity, operational redundancy and flow to reliably deliver water supplies and increase emergency response capability. Estimate assumes construction of 3.6 miles of 10.5 ft. diameter tunnel parallel to existing tunnel, with isolation valves and cross connections. Includes reliability upgrade to the Alameda Siphons situated immediately upstream. **Scheduled Completion**: 2009	**Scope**: Splits 2002 project into two separate projects: a) Construction of second Irvington Tunnel, which will be approx. 18,500 ft. (~3.6 miles) long and 10 ft. diameter; and b) Adds the construction of a seismically resistant fourth Alameda Siphon, approx. 66 inch diameter and 3,000 ft. long, rather than simply "upgrades" to existing three Alameda Siphons. **Scheduled Completion**: 2013	$143.9M	$61.9M	$87.45M	a)Irvington: $214.65M b) Alameda Siphons #4: $78.6M Total of Irvington Tunnel & Alameda Siphon #4: $293.25M

Figure 15. San Joaquin Pipeline No. 4: 2002 vs. 2005 Scope, Schedule and Cost

2002 Scope & Year Of Scheduled Completion	November 2005 Scope & Year Of Scheduled Completion [Significant Changes From 2002 Scope Are Underlined]]	2002 Cost Estimate (2003 Dollars)	Estimated Cost Change From Change in Budgeting Escalation and For Management Reserve	Estimated Cost Change Due to Scope Change	November 2005 Cost Estimate (Escalated)
Scope: Plan, design and construct a new 78-inch diameter SJPL #4 on PUC right of way, parallel to the existing pipelines, 47.5 miles across the Central valley. Construction could be accomplished in segments starting at Tesla Portal running westward towards Oakdale Portal, with cross connections to existing pipelines so the new pipeline can be placed in service as built and permit maintenance of other lines. **Scheduled Completion**: 2011	**Scope**: Reduce scope to 9.7 miles of 78-inch 4th pipeline along the existing SJPL alignment (prior to Tesla Portal), two crossovers, and replacement of approx. 6 miles of existing pre-stressed concrete cylinder pipe on SJPL #3. AND add new project entitled "SJPL – Rehabilitation of Existing System", to provide a condition assessment and rehabilitation of the existing SJPL's **Scheduled Completion**: 2014	$391.4M	$168.3M	($127.0M)	a) New SJPL #4: $352.7M b) Rehab. Existing SJPL #'s 1- 3: $80.0M Total of New SJPL #4 and Rehabilitation of Existing SJPLs: $432.7M

Figure 16. Calaveras Dam: 2002 vs. 2005 Scope, Schedule and Cost

2002 Scope & Year Of Scheduled Completion	November 2005 Scope & Year Of Scheduled Completion [Significant Changes From 2002 Scope Are Underlined]	2002 Cost Estimate (2003 Dollars)	Estimated Cost Change From Change in Budgeting Escalation and For Management Reserve	Estimated Cost Change Due to Scope Change	November 2005 Cost Estimate (Escalated)
Scope: Replace Calaveras Dam, which is seismically vulnerable, and currently limited by California Dept of Water Resources to a maximum level of 38,100 acre-feet (compared to 96,850 acre-feet design capacity) with a new earth and rock-fill dam 200 higher than the existing dam, adit structure and appropriate appurtenances. Includes a pipeline from the Dam to Sunol Valley Water Treatment Plant. **Scheduled Completion**: 2009	**Scope**: Replace existing Dam with new Dam, located just downstream from the existing site, with same storage capacity as the existing facility (96,850 acre-feet), but with a wider core and drainage system that would not preclude expansion in the future. Reconstruct existing chemical feed facilities located at dam. Widen and improve several hairpin turns. Deletes pipeline from the Calaveras Dam Replacement Project to San Antonio Backup Pipeline project from project scope. **Scheduled Completion**: 2012	$150.0M	$64.5M	$51.4M	$265.9M

Figure 17. Bay Division Pipeline Reliability: 2002 vs. 2005 Scope, Schedule and Cost

2002 Scope & Year Of Scheduled Completion	November 2005 Scope & Year Of Scheduled Completion [Significant Changes From 2002 Scope Are Underlined]	2002 Cost Estimate (2003 Dollars)	Estimated Cost Change From Change in Budgeting Escalation and For Management Reserve	Estimated Cost Change Due to Scope Change	November 2005 Cost Estimate (Escalated)
Scope: Approx. 17 miles of new BDPL #5 will be constructed in the right of way of the existing BDPL # 3 and 4. Project will consider a number of alternatives to provide at least 150 mgd to meet future water needs and continue to delivery supply in event of loss of another BDPL. Line will be built in sections best able to meet increased demand of southern Alameda and Peninsula areas and will be cross connected to BDPL #'s 3 and 4 to provide operational redundancy. **Scheduled Completion**: 2013	**Scope**: Project provides for 5th BDPL consisting of 9 miles of 72-inch pipeline and 7 miles of 60-inch pipeline from Irvington Tunnel portal to Newark, AND a 5 mile tunnel under San Francisco Bay and adjacent marshlands between Ravenswood and Newark valve houses. **Scheduled Completion**: 2014	$248.9M	$107.0M	$216.1M	$572.0M

c. Obtain a reconciliation from PUC staff of the project budget and actual expenditures from the PUC's program controls system (P3E) system to the FAMIS system. Review the reconciliation for appropriateness. Identify and provide explanations of significant reconciling items and/or where figures do not reconcile.

Before discussion of the FAMIS/Primavera reconciliation can be germane, 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 (P3E) is a management tool which allows monitoring of completion targets in relation to dollars spent and time consumed.

Here is one example of how the information shown in P3E will differ significantly from the information shown in FAMIS, and why. A project budget as shown in Primavera budget is based on each project's allocation of the total WSIP budget. By contrast, the project "budget" shown in FAMIS is based only on funding that has been approved to date by the Board of Supervisors (i.e. appropriated). As a result, the budgeted amounts in P3E and FAMIS will only agree when the Board of Supervisors has granted authority to expend the full WSIP budget for a given project.

That said, this reconciliation was based on each system's recordation of expenditures. The expenditure data is very comparable.

The expenditures of the two systems are never in complete agreement until the end of the fiscal year, on June 30th, due to timing issues. However, PUC staff performs a reconciliation of the data in P3E against the data in FAMIS on a monthly basis.

Our reconciliation of these systems as of Dec 31, 2005 determined there were three major components to the variance between the systems:

1) "Pre-CIP funding." In addition to Commercial Paper proceeds, the WSIP has relied upon approximately $19.6 million in general revenues to fund a portion of WSIP expenditures. This funding is referred to as "Pre-CIP funding," and our understanding is that it represents $9.8 Million in general revenues (including one-time revenue derived from the sale of property by the PUC in Pleasanton), as well as proceeds from pre-Proposition A bonds. Specifically, this includes $2.2 Million from the 1996A Bonds, and approximately $7.7 Million from the 2001A and 2002A Bonds. The Pre-CIP funding is included in P3E's database of WSIP revenues and expenditures, but not in FAMIS. In FAMIS, the pre-CIP amounts are accounted for in separate and distinct projects. Thus to arrive at the figures shown in P3E, one must add together both the WSIP and "pre-CIP" project amounts from FAMIS.

2) P3E only picks up expenditure data through the final pay period of the month while FAMIS continues to record these costs until month-end. These costs are picked up by Primavera in the following month. This is strictly a timing issue.

3) Labor costs that are not yet recorded in FAMIS are estimated at month-end based on work plans, and then incorporated into P3E. During the following month, when the actual labor costs are known from FAMIS, the Primavera estimates are brought back into line with FAMIS.

A list of the projects that received "pre-CIP" funding is presented below.

Figure 18. WSIP Projects Receiving "Pre-CIP" Funding

Fire Protection @ CDD	CUW30501	3,587
Crocker Amazon Pump Station Upgrades	CUW30601	760,682
Summit Reservoir	CUW30701	1,319,086
Sunset Circulation Improvements	CUW31101	2,259,010
Lincoln Way Transmission Line	CUW31201	829,930
La Grande Tank Seismic Upgrade	CUW31401	847,410
Lincoln Park Pump Station Upgrades	CUW32201	260,646
Potrero Heights Tank Seismic Upgrade	CUW32901	495,584
Lincoln Park Tank Seismic Upgrade	CUW33101	101,146
Potrero Heights Reservoir Rehabilitation	CUW33501	85,355
Subtotal - Local Program		**$6,962,436**
Seismic Upgrade of BDPLs @ Hayward Fault	CUW35301	791,200
Lower Crystal Springs Dam Improvements	CUW35401	857,235
Standby Power Facilities - Various Locations	CUW35501	37,875
New Crystal Springs Bypass Tunnel	CUW35601	3,255,683
Sunset Reservoir - North Basin	CUW35801	1,595,856
Irvington Tunnel Alternatives	CUW35901	2,098,322
Pulgas Balancing Reservoir Rehabilitation	CUW36101	22,381
HTWTP Short-Term Improvements	CUW36601	174,438
Bay Division Pipeline - Hydraulic Capacity Upgrade	CUW36801	1,612,592
Pipeline Repair & Readiness Improvements	CUW37001	114,908
Crystal Springs / San Andreas Transmission Upgrade	CUW37101	221,690
Calaveras Dam Replacement	CUW37401	544,618
Hetch Hetchy – Advanced Disinfection – UV	CUW38401	244,698
Tesla Portal Disinfection Station	CUW38701	1,054,159
SFPUC/EBMUD Intertie	CUW38901	69,269
Subtotal - Regional Program		**$12,664,924**
Total – WSIP Pre-CIP Funding		**$19,627,359**

At present, the pre-CIP funds are segregated from the Proposition A Bond Fund, and are treated as separate "projects" in FAMIS. According to PUC staff, they are working with the Controller's Office to combine these accounts to be better able to show total WSIP project costs.

Recommendation

- If the pre-CIP funds are to be commingled with Proposition A funds in FAMIS, then there should be safeguards in place to ensure that Bond Fund appropriations and expenditures can readily and easily be "carved out" for reporting purposes in the future.

The following table reconciles Primavera to FAMIS:

Figure 19. Comparison of Expenditure Data in Primavera vs. FAMIS

Expenditures As Of December 31, 2005	**Bay Division Pipeline**	**Irvington Tunnel**	**San Joaquin Pipeline**	**Calaveras Dam**
Primavera Expenditures	4,450,553	6,060,585	4,923,934	9,218,347
Less: Pre-CIP	(791,200)	(2,098,323)	(426,739)	(544,100)
& Est. Labor Cost	(51,768)	(37,608)	(55,229)	(20,104)
Adjusted Primavera Exp	3,607,585	3,924,654	4,441,966	8,654,143
FAMIS Expenditures	3,614,397	3,904,608	4,491,837	8,662,445
Difference	6,812	(20,046)	49,871	8,302

The differences have been explained above. They are negligible in comparison to total expenditures. However, from a purist accounting perspective, a better methodology would be to reverse the estimates used in Primavera at the beginning of the next month. That aside, it is gratifying to see Primavera is brought into line with FAMIS. Any other methodology would be troublesome. From an oversight perspective, both systems seem to be delivering the information for which they were put in place.

At this stage, according to the December 2005 Quarterly Regional Status Report (Section 2.0 on How to Read Project Status Reports), PUC indicates that expended to date data generally excludes accruals, except for accruals for overhead and fringe benefits for the last pay period. But in subsequent quarterly reports, accruals for all professional services contracts will be included in the report for the payments approved by the Project Managers, but not yet paid. This additional step is to be commended, and will help provide PUC staff and other readers with a better sense of the actual financial status of each project.

Recommendation

We have the following recommendations for minor improvements.

- That the Primavera estimated month-end labor costs be reversed in the following month, if possible.
- A true reconciliation should occur on a monthly basis, instead of just balancing to FAMIS.

d. Reconcile the CIP appropriations and transactions in the FAMIS system.

AND

e. Reconcile the CIP appropriations and the authorizing budgetary documents adopted by the Board of Supervisors.

In the course of the audit, our review pertaining to FAMIS uncovered nothing of concern. The appropriation amounts reflected in FAMIS as of December 31, 2005 were traced back to the authorizations of the Board of Supervisors. The amounts tied for each specific authorization and in total for the four projects under review. The amounts by date of approval are listed in the following table.

Figure 20. Amounts Authorized By Board Of Supervisors

PROJECT	JUN 2003	JUL 2004	APR 2005	AUG 2005	TOTAL
Bay Division Pipeline	$724,000	$4,000,000	$2,883,000	$15,800,000	$23,407,000
Irvington Tunnel	1,330,000	3,515,000	500,000	4,754,000	10,099,000
San Joaquin Pipeline	2,514,000	500,000	1,000,000	4,337,000	8,351,000
Calaveras Dam Replacement	7,893,000		2,869,000	4,197,000	14,959,000

- In addition, we were able to verify that there were no expenditures charged to any of the Proposition A projects under review prior to November 2002. We determined that salaries attributable to these projects were charged to PUC general revenues (pre-CIP funds) both prior and slightly after the November 2002 date.

f. Vouch a sample of expenditures to invoices, contracts, and other supporting documentation.

We are not aware of any industry standards regarding the appropriate sample size for a vouching examination. We checked the U.S. Government Accountability Office's "Government Auditing Standards" Handbook, and in Chapter 7 concerning fieldwork, found the following text:

- "Sec 7.17 When laws, regulations or provisions of contracts or grant agreements are significant to the audit objectives, auditors should design the audit methodology and procedures to provide reasonable assurance of detecting violations which could have a significant effect on the audit results…..

- Sec 7.18 It is not practical to set precise standards for determining whether laws, regulations, or provisions of contacts or grant agreements are significant to audit objectives because government programs are subject to many laws, regulations, and provisions of contracts or grant agreements, and audit objectives may vary widely."

Given the lack of a firm standard in this area, we used our professional judgment to determine how many invoices to examine in connection with this task. We reviewed 56 invoices totaling approximately $5,000,000. This represented 21% of the invoices and 42% of the non-personal services expenditures associated with these four projects. Most of the transactions exceeding $100,000 were reviewed and lesser amounts were chosen by random sample. In the non-personal services area, there were two objects that accounted for the preponderance of expenditures. They were engineering services and overhead. For engineering services, in the case of multiple providers, at least one invoice over $10,000 for each was reviewed.

A summary of the invoices reviewed is presented in the next table.

Figure 21. Summary of Invoices Reviewed

Project	Fiscal Year	Non-Personal Services Costs (1)	Amount Reviewed	% of Total	No. Of Invoices	% Of Invoices
BAY DIVISION PIPELINE	2003 - 2004	$90,914	$43,659	48	2 of 6	33
	2004 - 2005	$398,866	$195,720	49	4 of 17	24
	2005 - 12-31-05	$1,768,622	$676,545	38	1 of 8	13
	Total	*$2,258,402*	*$915,924*	*40*	*7 of 31*	*22*

IRVINGTON TUNNEL	2003 - 2004	$523,714	$227,091	43	3 of 12	25
	2004 - 2005	$980,592	$361,487	37	6 of 34	18
	2005 - 12-31-05	$329,087	$95,784	29	3 of 15	20
	Total	*$1,833,393*	*$684,362*	*37*	*12 of 61*	*20*
SAN JOAQUIN PIPELINE	2003 - 2004	$526,711	$192,173	36	3 of 14	21
	2004 - 2005	$602,696	$256,354	43	3 of 18	17
	2005 - 12-31-05	$352,234	$174,660	49	3 of 10	30
	Total	*$1,481,641*	*$623,187*	*42*	*9 of 42*	*21*
CALAVERAS DAM	2003-04	2,563,177	707,616	28	4 of 25	16
	2004 - 2005	1,792,021	519,909	29	9 of 56	16
	2005 - 12-31-05	1,956,588	1,494,868	76	15 of 54	28
	Total	*6,311,786*	*2,722,393*	*43*	*28 of 135*	*21*
GRAND TOTAL		***$11,885,222***	***$4,945,866***	***42***	***56 of 269***	***21***

Notes:
[1] Appropriations under $10,000 were excluded.

Because of the materiality of the overhead expense, our review was expanded to include this topic. Based on discussions with PUC staff, we determined that the methodology for calculating the overhead rate was appropriate. We also determined that this methodology has been consistently applied over the last several years. However, the magnitude of the 200% overhead rate (actually, this is comprised of a 175% overhead rate and a 25% fringe benefit rate) caused us to inquire further into its reasonableness. We determined the rate to be high due to the small base to which it was applied, rather than any inappropriateness of the costs included. Only the direct labor costs of the Department are used as the denominator to determine the rate. We verified that both the Municipal Railway and Department of Public Works use this same methodology in establishing their indirect rates. We noted that the costs charged as indirect cost to the various projects do not include those administrative personnel charged directly to the enterprise system.

The RBOC asked us to identify the types of costs that are included in the overhead rate. Our understanding is that the overhead rate is used to recover the costs of: a) "indirect labor," which includes the Office of the Deputy General Manager, and Managers and administrative staff in several PUC bureaus that work on the WSIP, but

do not charge to any specific project; b) Rent, travel and materials and supplies for all PUC staff, whether they be "direct" or "indirect"; and c) certain costs from other City Departments, that so far as we can tell, are not charged directly to projects. Please note that a more detailed review of the overhead rate calculations and methodology is beyond the scope of our current review.

In reviewing the contract payment and other invoices, we determined that all had the proper "encumbrance" documents in place to allow payment. The payments themselves were for the appropriate time period, for the proper amount, to the correct vendor, and for the appropriate goods and services. We also noted that there is an extensive approval process in place.

Year-end accruals are submitted by project managers based on unpaid invoices and these estimated expenses are reviewed by Finance for appropriateness. The accruals are then recorded on the books for reporting purposes and reversed immediately in the ensuing fiscal year.

Recommendation

- The invoice approval process, with its many required signatories, appears cumbersome. The Department should investigate the utilization of electronic signatures as a means of streamlining and expediting the process.

g. Verify that no expenses paid for with Proposition A funds were incurred prior to November 2002.

AND

h. Identify any discrepancies noted in analyses detailed above in subtasks a-g and provide explanations.

- We were able to verify that there were no expenditures charged to any of the Proposition A projects under review prior to November 2002. We determined that salaries attributable to these projects were charged to PUC general revenues (pre-CIP funds) both prior and slightly after the November 2002 date.

- Any discrepancies found in our analyses have been described above. None of them were found to be significant.

Chapter 3 - Conclusions

- The financial data used in the Primavera System, a project management system that is used to track project budgets, schedules and expenses, among other things, is being reconciled to financial data from the City's FAMIS system. Primavera is the source of the financial data used to prepare the WSIP Quarterly Reports, so it is important for the data to tie to the City's official financial records as closely as possible.
- We were able to verify that there were no expenditures charged to any of the Proposition A projects under review prior to November 2002. We determined that salaries attributable to these projects were charged to PUC general revenues (pre-CIP funds) both prior and slightly after the November 2002 date.
- We confirmed that $19.6 million in "pre-CIP" general revenues and pre-Proposition A bond proceeds have been spent on the WSIP.
- Although the invoice approval process appears to be cumbersome, we found no problems with any of the 56 invoices that we vouched, representing approximately $5 million in expenditures.

Chapter 4. Review of WSIP Budget and Management Reports

Task 6 asked us to conduct the following evaluations:

- Review how the SFPUC's program controls system (P3E) and internal control procedures for accounting of capital projects.
- Identify how changes in budget, scope, and schedule are accommodated.
- Identify the key reports that are used to monitor the WSIP program; assess frequency and usefulness of system's reports used by project managers, Board of Supervisors, PUC Commission, senior management, outside stakeholders, or other state and local agencies.
- Provide recommendations for areas of improvement.

November 2005 WSIP Budget

This Chapter begins with a brief review of the format of the November 2005 WSIP. From the perspective of budget "transparency," the November 2005 WSIP Program Budget is a vast improvement over the 2002 and 2003 CIP's, and this will greatly assist the RBOC in reviewing the status of WSIP projects going forward.

In particular, the Attachment to the October 21, 2005 "WSIP Cost Breakdown By Sub-Regional Project" worksheet, which was submitted to the Commission by General Manager Leal on November 23, 2005, provides many useful insights into how each WSIP project's budget was developed, such as:

- Current phase of development (e.g. alternatives analysis, conceptual engineering, design, construction). This provides one indicator of the accuracy of the construction estimate, because all else held constant, the farther along in the development process a project progresses, the more accurate the construction cost estimate will become;
- The current base construction estimate;
- The amount and percentage of construction estimate contingency included in the project budget;
- The amount and percentage of escalation included in the project budget;
- The amount and percentage of construction contingency funding built into the project's budget;
- The environmental mitigation budget, the Arts Commission budget, and the land and right of way acquisition budget for each project; and

- The program management budget, pre-design planning, environmental planning and review, engineering design, construction management and Department and Agency budgets for each project.

Example: November 2005 Budget for Bay Division Pipelines Project

The table below presents the breakdown of the Bay Division Pipeline Reliability project (CUW36801), in order to provide a concrete example of the level of detail shown for each project budget in the November 2005 WSIP.

Figure 22. Breakdown of Bay Division Pipelines Reliability Project Budget From November 2005 WSIP

Budget Category	**Budget Amount**	**Notes**
Construction Cost Estimate	$249,412,000	Project currently at Conceptual Engineering stage
Estimate Contingency	$74,824,000	30% of construction cost estimate, based on current stage of project development
Construction Escalation	$82,412,000	Approx. 25% of construction cost estimate + estimate contingency
Base Construction Cost	$406,648,000	
Construction Contingency	$30,240,000	Approx. 7.5% for unforeseen site conditions, contractor claims
Escalated Construction Cost + Construction Contingency	**$436,888,000**	
Art Commission Fees	$250,000	
Environmental Mitigation	$20,608,000	
Total Construction Cost	$457,746,000	
Land/Right of Way	$5,000,000	
Management Cost (Project and Program) [1]	$26,214,000	6% of escalated construction costs + construction contingency (program mgt = 2%, project mgt = 4%)

Category	**Budget Amount**	**Notes**
Pre-Design Planning	$8,738,000	2% of escalated construction costs + construction contingency
Environmental Planning & Review	$8,738,000	2% of escalated construction costs + construction contingency
Engineering Design	$34,951,000	8% of escalated construction costs + construction contingency
Construction Management and Contract Administration [2]	$43,689,000	10% of escalated construction costs + construction contingency
Department & Agency Fees [3]	$4,369,000	1% of escalated construction costs + construction contingency
Total Project Budget as of November 2005	**$559,445,000**	

Notes:

[1] According to the Parsons/CH2MHill report, page 8-7, "Program Management" costs provide for planning and coordination; support personnel from the PUC's communications, legal and finance staff; program controls, reporting, estimating and scheduling at the program level, document control, and community outreach programs. "Project Management" costs are those that can be allocated to a specific project, such as a project manager's costs to manage the project. They also "include specific project controls, cost estimating, scheduling, quality assurance and quality control, interfacing between PUC departments, and total project oversight for all project phases."

[2] Construction Management includes "resident engineering, inspection, construction management, administrative support, scheduling, estimating, claims analysis, safety and closeout," as well as testing, contract administration (which can be significant for large projects), and labor relations administration (Parsons Report, page 8-8).

[3] This covers the costs for support offered by other City Departments.

This level of detail on each project's budget will allow the RBOC to clearly track how project budgets change as they progress through the development process, and to the extent that project cost estimates increase over time, how much of each project's contingency funds remain intact. By tracking the status of available contingency funding throughout the program, the RBOC will be able to monitor whether pressure on the Program's scope or overall budget is likely to develop.

Primavera System As Program Management Tool

We have discussed the Primavera system (P3E), and its use, with PUC staff in detail. PUC staff indicates that they have been working since early December 2005 on updating the data in P3E to reflect the WSIP as it was approved by the Commission on November 29, 2005. WSIP project managers are currently undergoing, or have recently completed, training in the use of the system. With respect to the use of P3E as a management tool:

- The financial data used in the P3E system ties very closely to the data in FAMIS, and accurately tracks the appropriations that have been approved by the Board of Supervisors.
- To the extent that PUC is able to utilize P3E in the manner that they intend, it can provide them with a strong online project and program management system to track the financial data and schedule milestone status of each project within the WSIP.

We do not want the latter statement to sound cavalier – keeping the data up to date, and ensuring that project managers use the system properly, will require the investment of significant time and effort by PUC staff throughout the life of the program. But without a system such as this one, successful management of a program as vast as the WSIP would be extraordinarily difficult.

Budget Controls – The Project Change Control Review and Approval Process

The potential for major scope, schedule and cost changes to occur throughout the life of the WSIP program, during both the design and construction phases, requires that the PUC develop a formal set of guidance for WSIP project managers on "Project Change Control," and a well-structured process for evaluating the trade-offs that will arise as changes are considered. This process must balance the need for:

- Supporting changes that are necessary to maintain the function and performance of a project;
- Keeping an eye on the Program's bottom-line; and
- Facilitating prompt decision-making, so that projects are not delayed while awaiting a decision.

PUC's Program Development and Support Bureau has developed draft Project Change Control Procedures as part of their CIP Procedures Manual, and expects to finalize these Procedures by the end of June 2006. PUC staff is attempting to prepare guidelines, and develop electronic approval tools, that combine the need for review and accountability with the desire not to grind the approval process to a halt for every project change.

A "CIP Steering Committee" has been created, chaired by the Deputy General Manager for Infrastructure and Operations. In the draft CIP Change Control Procedures:

- A Project Manager may approve budget changes of up to $100,000;
- A Senior Project Manager may approve budget changes of up to $300,000;

- Decisions concerning project budget increases of between $300,000 and $500,000 would require the approval of the Managers of the Engineering Design Bureau, the Construction Management Bureau, the Program Development Bureau and the Project Management Bureau; and

- Decisions concerning project budget changes of over $500,000 would be elevated to the CIP Steering Committee, which will recommend whether to approve or reject a proposed change to the Assistant General Manager (AGM) for Infrastructure. The AGM will in turn develop a recommendation concerning whether to approve or reject a change over $500,000 to the Deputy General Manager for Infrastructure and Operations.

While the approval parameters laid out in the draft Procedures are reasonable, it is possible that many relatively small (under $300,000) scope changes could occur, which in the aggregate, would add up to millions of dollars in cost increases, without undergoing scrutiny by Bureau Managers, the AGM of Infrastructure, or the DGM of Infrastructure and Operations. The AGM for Infrastructure and the DGM for Infrastructure and Operations will need to be aware of the changes that have already occurred within each project's budget, and within the program as a whole, when they make their decisions concerning changes exceeding the $500,000 threshold, in order to protect the Program's bottom-line.

Also, PUC management will need to ensure that no project manager tries to "game" the Change Control system by splitting a single change order into two or more smaller change orders, in order to avoid management scrutiny.

Oversight Role of the Commission

At the February 14, 2006, Commission meeting, Commission President Sklar indicated that the Commission plans on examining each WSIP project, and focusing attention on projects facing obstacles to timely completion and/or cost overruns. Our understanding is that the Deputy General Manager for Infrastructure and Operations will be providing an oral report on the status of the WSIP at every Commission meeting. These activities will be helpful in focusing the attention of PUC staff and management on identifying problem areas and working promptly on ways to resolve them.

More discussion regarding managing the WSIP budget is found in Chapter 5, under the heading "Issues to Watch."

Key Report to Stakeholders – WSIP Quarterly Update Report

The key report that will be used by PUC staff, the Commission, the Board of Supervisors and other stakeholders to monitor the WSIP will be the "WSIP Quarterly Update Report." To date, two Quarterly Update Reports have been produced, dated February 10, 2006, which covers the quarter ending December 31, 2005, and a second dated May 16, 2006, which covers the quarter ending March 31, 2006. Due to the timing of our engagement, we focused on the December 2005 Report, and have the following observations about it.

Strengths

- The "Highlights" section of the Report, and the individual project status reports, provide a fairly candid assessment of the obstacles facing a given project and the program as a whole. Overall, the first WSIP Quarterly Report was a strong initial product.
- Section 1.4 of the Report, entitled "Critical Issues," should be the first section that RBOC members turn to each quarter. For the December 2005 Report, the issues highlighted in the Regional Report included:
  - Funding (the need for additional supplemental appropriations to prevent project delays)
  - Environmental Review
  - Programmatic EIR
  - Right of Way
  - Contracting methods (e.g. working with the Human Rights Commission, finding technically qualified proposers)
  - "City process" (the process required to hire staff with the technical qualifications needed for various aspects of the WSIP).

Areas For Improvement

- A critical issue that will face the PUC going forward is how best to distill the detailed information found in the Quarterly Reports into a concise document for decision-makers that conveys key information about program status, issues and obstacles – particularly when action could be required by those decision-makers to remove those obstacles. Although the Quarterly Reports are solid documents, they are too long to be digested by most decision-makers, who must focus on many different issues each day.
- The summary tables in the Report focus on schedule information, expenditure data, and percentage completion figures by "phase" (i.e. program management, project planning, environmental review, design and construction) for the program as a whole and by subregion.

  This information is useful, but should be supplemented by a table (a sample of which is shown in Figure 11) that presents these same data points by subregion and WSIP project, so that readers can track the progress of the WSIP in the same format that the WSIP budget is laid out.
- The Quarterly Report includes status reports regarding virtually every WSIP project, but in the December 2005 Quarterly Report, certain projects were included in the reports of related projects. For example:
  - Alameda Siphons is included in the Status Report for the Irvington Tunnel
  - BDPL Nos. 3 & 4 Crossover/Isolation valve is included in the Status Report for the Seismic Upgrade of BDPL's No. 3 & 4.

In earlier iterations of our Report, we recommended that the PUC create separate status reports for each WSIP project. As of the March 2006 Quarterly Status Report, PUC has added separate project status reports for these two projects.

Public Availability of Quarterly Report

At the February 14th meeting, PUC staff presented the Commission with the first WSIP Quarterly Update Report for the Regional program. However, no hard copies of the report were made available for members of the public. Granted, public turn out at Commission meetings is not high. And our understanding is that due to the sheer size of the Quarterly Report, PUC staff found it to be prohibitively costly to attempt to print many copies of the Report, so they are relying on the availability of electronic copies. Given this approach, we recommend that the PUC post the document on their website, and publicize its availability on the WSIP's home page. PUC posted its first Quarterly Report in May 2006, and now prominently features the WSIP Quarterly Report on its Agency's home page.

Chapter 4 - Conclusions

- The November 2005 WSIP budget provides a level of detail on each project's budget that will allow the RBOC to clearly track how project budgets change as they progress through the development process, and to the extent that project cost estimates increase over time, how much of each project's contingency funds remain intact.

  By tracking the status of available contingency funding throughout the program, the RBOC will be able to monitor whether pressure on the Program's scope or overall budget is likely to develop.

- The PUC has drafted a set of Budget Control procedures for all capital projects, known as Change Control procedures. These procedures will be critical to the management of the WSIP scope, schedule and budget. Once the procedures are finalized, the RBOC should be briefed on how they will work.

- The Commission has indicated that they will review the status of each WSIP project, and focus attention on problem areas.

- The WSIP Quarterly Report is the primary vehicle that will be used to keep stakeholders apprised of the status of the WSIP. The first Quarterly Report, which covered the period ending December 31, 2005, was a good initial product, and it addressed the issues or challenges facing the WSIP in a direct fashion. The March 2006 Quarterly Report demonstrated that the PUC is making ongoing improvements to the format of the Report. However, the PUC must find a way to distill the key information and issues in the Quarterly Report for decision-makers. The Quarterly Report could be improved by adding summary tables organized by project and subregion, such as the format found in Figure 11, and ensuring that each WSIP project has its own project status report.

Chapter 5. Issues To Watch And Potential Topics for Future Inquiry

This Chapter provides our recommendations for issues that the RBOC should track over time, and our suggestions for topics that could be worth additional study.

A. Issues to Watch

Scope, Schedule and Cost Uncertainty

Many WSIP projects face significant uncertainty with regard to project scope and schedule, both of which could significantly affect a project's final cost. Although PUC has built a substantial amount of Contingency funding throughout the WSIP budget ($454 million in construction estimate contingency and $225 million in construction cost contingency), it is still quite early in the life of the WSIP, and several factors could cause the overall $3.7 Billion WSIP budget (excluding financing costs) to come under pressure. Many of these were discussed in the Parsons/CH2M Hill "Program Assessment Report" (October 21, 2005), but are worth reiterating here. These include:

- *Scope, schedule and associated cost changes driven by changes in policy.* Although extensive work and public outreach was undertaken to devise the 2005 Level of Service goals that drive the scope of WSIP, there is the risk that changes in policy, which could in turn be prompted by changes in the political environment or other factors, could cause these goals to be changed in the future. Our understanding is that a significant change in a key Level of Service goal could produce substantial changes to the program's scope, schedule and cost.

- *Scope changes, and associated cost changes, associated with increasingly detailed project designs.* The vast majority of WSIP projects are currently in relatively early phases of planning or design. Typically, cost estimates become more precise as a project progresses through the design phase. As a result, at this time, the project cost estimates associated with the majority of WSIP projects still reflect a significant degree of uncertainty.

  In the November 2005 WSIP, the PUC addressed this issue by including large construction estimate contingency factors in many project budgets, which varied depending upon each project's current phase of development. These range from 25% to 40% for projects in Pre-Planning, 20% to 35% for projects in Alternative Analysis, 15% to 30% for those in Conceptual Engineering, and 10% to 20% for those at the Midpoint of Design.

  These contingency factors are much higher than what PUC had previously used, and are based in part on analyses by Parsons/CH2MHill of the contingency factors used by other large water improvement programs in the country. The open question is whether in aggregate, the contingencies will provide enough cushion to keep the program as a whole within the

November 2005 budget by the time all projects have completed design.

- *Schedule changes and associated cost changes due to environmental review processes.* As the Parsons/CH2MHill Report indicates, the Programmatic EIR "is the most significant risk factor" to the program's schedule, and the schedule "presents the single greatest risk to the delivery of this program." (page ES-8). As they indicate, the PEIR creates the critical path for most of the large WSIP projects, and continued delays in its completion would impact the program's currently adopted schedule and budget.

  To the extent that the program's schedule, or one or more major project schedules, slips due to delays in the environmental review process, construction cost estimates would be escalated by approximately 3.5% per year or by the appropriate escalation factor in use at that time.

  On a WSIP construction budget of approximately $2.146 Billion, using a back-of-the-envelope calculation, a one-year delay in the program would result in an extra 3.5% in escalation, which translates into about $75.1 Million in additional construction cost. And this assumes that the 3.5% escalation factor does not underestimate the actual impact of construction cost inflation.

- *Timing and cost impacts associated with the need for right of way or easement acquisition.* In certain cases, projects require right of way acquisition before they can proceed. For example, the San Joaquin Pipeline No. 4 faces power line and farm land encroachment issues affecting its right of way. Parsons/CH2MHill indicates that these issues could take four years to assess, negotiate and litigate (page 4-7).

- *Changes in scope and/or schedule due to unforeseen conditions or weather-related delays encountered during construction*. Obviously, weather can play havoc with construction schedules. Construction schedules usually include a specific number of "weather days" of float. The *El Nino* season of 1998 used up all of the weather days for many SFO construction projects, even though the construction program was not scheduled to be completed until 2000.

  In addition, there is the potential for unforeseen conditions – conditions that do not become apparent until construction is in progress, and are not incorporated into design phase cost estimates -- to arise, such as in connection with the replacement or rehabilitation aging infrastructure. Our understanding is that PUC has built a 10% construction contingency into its project budgets specifically for unforeseen conditions.

Determinations of Prioritization and Overall Program Affordability

A topic that is not explicitly addressed in the PUC's draft Change Control process is the determination of affordability. Early on in the life of the WSIP, proposed budget changes will be funded from on each project's own contingency reserves, leaving the rest of the Program's budget unaffected. Over time, however, increases in a project's budget may be above and beyond the project's own contingency reserves.

That raises the question of how such budget changes would be funded. One possibility is from transfers from another WSIP project. So long as a set of projects are coming in under budget, that approach provides a feasible funding strategy.

- But at some point, PUC may face the choice of whether to scale back the scope of one or more projects, or to increase the overall budget of the WSIP program. And that raises the question of how PUC will determine what level of changes are affordable.

The Parsons/CH2MHill Report framed this issue another way, when they recommended that the PUC undertake a WSIP "project prioritization." We would not expect the PUC to be ready to address this type of issue so soon after the adoption of the November 2005 WSIP, and before most projects proceed through the design process. Nevertheless, it is a question that the RBOC should keep in mind. Also, please note that based on the current appropriations language approved by the Board of Supervisors, budget transfers within a subregion do not require Board action, but budget transfers from one subregion to another, or to and from certain stand alone projects, do require Board action.

Change Control Challenges

Chapter 4 discusses PUC's draft capital improvement "Change Control" procedures. Even once a rigorous review and approval process is formalized, which is expected by the end of June 2006, the PUC will face challenges associated with:

- Managing geographically dispersed projects;
- Keeping up with the pace of changes, which is likely to accelerate once major projects move into design and then construction; and
- Confronting pressures to make changes to project scopes after the design process has been completed.

This latter issue confronted SFO during its construction program, as requests from airport tenants (e.g. airlines, federal agencies) for changes to already finalized designs resulted in cost increases and schedule impacts. Often, the requested changes had merit, and improved the functionality of the project. But the effect on construction schedules, and the overall construction budget, was significant, and had to be carefully managed. In the case of the PUC, the pressure to make changes to adopted project scopes and designs could come from any of the WSIP's many stakeholders.

Effective Communications With Stakeholders

PUC's ability to communicate regularly and effectively with its many WSIP stakeholders (Board of Supervisors, regional water customers, State Legislature, bond rating agencies) concerning the status of the WSIP, any significant changes to WSIP projects that may occur over time, and the obstacles that the Program faces, will be critical maintaining public support, and a smooth flow of funding, for the WSIP program. PUC's objectives should be to:

- Keep stakeholders from feeling surprised; and

- Maintain their credibility, even as numbers are moving. PUC must strike a balance between keeping their cost estimates up-to-date and changing the WSIP budget so often that their cost estimates lose credibility with stakeholders.

For a program of this magnitude, accomplishing these objectives is a challenge.

Role of PUC Finance Staff in Project Funding Decisions

Perhaps this reflects the bias of RBOC's consultants, who are former City Finance staff, but one observation we have is that PUC's Finance staff is not shown as participating in the approval chain for change orders (see the discussion of the draft Project Change Control procedures in Chapter 4). This may be a reasonable approach, since Finance staff could become bogged down by the sheer volume of requests, if they are placed in the approval path for change orders.

That said, the PUC should develop a mechanism for keeping PUC's Finance staff apprised of significant changes in the WSIP in a timely manner, and not just through the WSIP Quarterly Reports. Finance staff serves as the liaison between the PUC and the bond rating agencies regarding what will become a multi-billion debt program. The rating agencies periodically will turn to Finance for up-to-date information about the status of the program. Keeping Finance "in the loop" will permit them to quickly and accurately respond to rating agency requests for information, and ideally to communicate with the rating agencies on a proactive rather than a reactive basis.

- Having PUC Finance participate in the CIP Steering Committee, perhaps as a non-voting member, is one way to provide them with timely information and an understanding of the trade-offs involved in the decision-making process. During SFO's $2 Billion construction program, the equivalent of the AGM for Business Services served on the Airport's version of the CIP Steering Committee.

B. Potential Topics for Future Inquiry

We recommend that the RBOC consider the following list of topics as possible future areas of inquiry. To the extent that one or more of these ideas is of interest to the RBOC, we can assist in further defining its scope.

1. Annual Review Of Appropriations And Expenditures For 5-10 Randomly Selected WSIP Projects

This standard audit task would consist of several of the subtasks that were included in Task 4 of this engagement. These include:

- Review the reconciliation of the project budget and actual expenditures from the PUC's program controls system (P3E) system to the FAMIS system. Review the reconciliation for appropriateness. Identify and provide explanations for discrepancies.

- Reconcile the CIP appropriations and transactions in the FAMIS system.

- Reconcile the CIP appropriations and the authorizing budgetary documents adopted by the Board of Supervisors.

- Vouch a sample of expenditures to invoices, contracts, and other supporting documentation.

As indicated in the results of Task 4, the PUC has performed well to date in these areas. The purpose of this annual assignment would be to ensure that this level of performance continues.

We recommend that the next occur begin in September 2006, using year-end FY2006 data from FAMIS and Primavera. The RBOC's consultant will need to be sensitive to the competing demands on PUC Finance staff during that period, as they also will be working with their external auditors on the PUC's FY2006 financial statements at the same time.

2. Develop Detailed Understanding Of How A WSIP Project Budget Is Built, And How A Project Budget Is Managed

If the RBOC wants to keep track of how well the WSIP budget is being managed over time, it will be important to understand how the budget was built. The types of questions that should be addressed are:

- How are cost estimates for construction developed?

- What are the factors that go into determining contingency percentages by phase?

- What is the basis for the Program's escalation factors? What could cause those factors to change over time?

The objective of this review would not be to second-guess the PUC's capital project costing methodology, but to gain an understanding of how a project's budget is derived from the bottom-up. Then, once the Change Control procedures are finalized, the RBOC would review those procedures so that the Committee understands how the PUC intends to control scope, schedule and costs, and who will be making the decisions on these issues.

This would be useful background for RBOC members in the future, as they review changes to cost estimates, project scopes and budgets.

3. Focus Attention on Limited Number of High Profile Projects

- Identify 10 projects, starting with the highest cost WSIP projects at the outset. Ideally, this would include projects that are at various stages of development (planning, design and construction).

- Receive regular status reports concerning those projects, and changes to each project as it progresses through the development process.

- Over time, the RBOC can amend the list of projects that it tracks in detail to focus on those that reflect the greatest uncertainty regarding project scope, schedule and cost, based on the ongoing review of the WSIP Quarterly Reports.

It will not be possible for the RBOC to remain fully apprised of the status of all WSIP projects throughout the life of the program. However, the Committee will want to develop a mechanism for keeping up to date on the status of the projects that, at any point in time, have the greatest potential for scope, schedule and cost changes. In order to keep the list manageable, we have suggested limiting the number of projects that are tracked in detail to 10, but the actual number may vary depending upon the status of the program.

In terms of developing the initial tracking list, we would suggest focusing first on the 10 projects with the highest estimated costs from the November 2005 WSIP. These include (November 2005 budget listed in parentheses):

- San Joaquin subregion:
  - San Joaquin Pipeline ($352.7M)
- Sunol Valley subregion:
  - Sunol Valley New Treated Water Reservoir ($102.4M)
  - Calaveras Dam ($265.9M)
  - Irvington Tunnel ($214.65M)
  - Additional 40 MGD Treated Water Supply ($133.1M)
- Bay Division subregion:
  - Bay Division Pipeline Reliability ($572.0M)
- Peninsula subregion:
  - Crystal Springs/San Andreas Transmission Upgrade ($148.6M)
  - Harry Tracy Water Treatment Plant – Long-Term Improvements ($167.6M)
- San Francisco subregion:
  - University Mound reservoir – North Basin ($102.9M)
  - Recycled Water Project ($201.6M)

In aggregate, these 10 projects represent $2.26 Billion or 60% of the $3.75 Billion WSIP program budget (excluding financing costs). The project list should be adjusted over time, and expanded if necessary, to focus on those projects that appear to require the greatest attention.

4. Debt Strategy – Review of Alternatives

Although a primary focus of Proposition P is on the expenditure of bond proceeds, a related topic concerns the debt service expenses that flow from the debt financing of the WSIP and other PUC capital improvement programs.

In the November 23, 2005 memorandum to the Commission concerning the financing of the WSIP, PUC staff estimated that financing the WSIP would require the issuance of approximately $4.3 Billion in tax-exempt revenue bonds. There are many options for how the PUC's debt portfolio could be structured, and PUC has developed a financing strategy for the WSIP that calls for a combination of fixed rate and variable rate debt.

This review would examine how PUC currently intends to finance the WSIP, how the WSIP financing program fits into the PUC's larger bond financing strategy, the various policies that affect the financing plan (e.g. the debt service coverage target; the O&M reserve target), and the pros and cons of the various debt structuring alternatives available to the PUC to manage its debt service expenses.