

**BRIGHTWATER PROJECT OVERSIGHT REPORT FOR QUARTER ENDING JUNE 30, 2009**

**CURRENT RISK RATING** ◆ Corrective action is needed to address the schedule delay, increased cost, issues, and risks described below.



**PROJECT DESCRIPTION**

The Brightwater wastewater treatment system is being constructed to meet the capacity needs outlined in the Regional Wastewater Services Plan. The new treatment plant is located north of State Route (SR) 522 and east of SR 9 with 36-million gallons per day capacity. It includes membrane bioreactor secondary treatment systems, Class B biosolids and reclaimed water production, odor control, and disinfection systems. The conveyance system includes 14 miles of large diameter tunnel connecting the plant to a marine outfall in Puget Sound, diversion structures to direct flow from existing sewers into the new system, and an influent pump station. A reclaimed water system is also being constructed. The Wastewater Treatment Division (WTD) is the project manager. The project is currently in the construction phase with multiple contracts using GC/CM, Design-Bid-Build, and Design-Build delivery methods. R.W. Beck is the Oversight Monitoring Consultant (OMC). Their quarterly report is attached.

**PROJECT STATUS** ● = No Current Concerns ▼ = Attention Needed ◆ = Corrective Action Needed

● **Scope**

The scope of the final project has not changed, but plans are to start up the treatment plant prior to completion of the conveyance system. This change mitigates some of the risk of the conveyance system schedule delay; however, the cost and schedule implications are still being evaluated.

◆ **Schedule**

<u>Milestone</u>	<u>Approved Schedule</u>	<u>Current Forecast</u>	<u>Comment</u>
Treatment Plant substantial completion	Jan. 2011	Feb. 2011	weather days awarded
Conveyance System hydraulic completion	Jan. 2011	unavailable	contractor submittal pending
Accept wastewater for treatment	Mar. 2011	Aug. 2011	sending effluent to other plants

▼ **Budget<sup>1</sup>**: Cost updates show estimated costs at completion exceeding the baseline budget.

Project	Adopted 2004 Baseline		WTD 2009 Cost Update		OMC 2009 Estimate		LTD Expenses	LTD %
	3% Inflation	5% Inflation	Low <sup>2</sup>	High	Low	High	Thru July 09	Expended
Conveyance	1,021	1,106	921	955	929	967	612	66%
Treatment Plant	640	684	879	890	892	907	580	66%
<b>Total</b>	<b>\$1,660</b>	<b>\$1,790</b>	<b>\$1,800</b>	<b>\$1,844</b>	<b>\$1,821</b>	<b>\$1,874</b>	<b>\$1,192</b>	<b>66%</b>

<sup>1</sup> All costs are shown in \$ millions.

<sup>2</sup> WTD's opinion of most probable outcome. This is the amount used for the Life to Date (LTD) % calculation.

▼ **Issues and Risks:** Strategies are in place but may not be adequate to address the following:

- Both Central Tunnel boring machines are stopped for extensive repair.
- After Central Tunnel mining resumes, additional maintenance stops and schedule delays may occur.
- Disagreement with Central Tunnel contractor over payment provisions related to cost of delay is likely.
- West Tunnel mining through high water pressure areas may slow progress.
- Treatment Plant instrumentation and control submittals are delayed, but no schedule impact at this time.

**For detailed information regarding this project, see the following report**

**King County Auditor's Office – Cheryle Broom, County Auditor**

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**Capital Projects Oversight Program – Tina Rogers, Manager**

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CPO oversight reports are available on the Auditor's Web site ([www.kingcounty.gov/operations/auditor/reports](http://www.kingcounty.gov/operations/auditor/reports)) under the year of publication. Copies of reports can also be requested by mail at 516 Third Avenue, Rm. W-1033, Seattle, WA 98104, or by phone at 206-296-1655.

**ALTERNATIVE FORMATS AVAILABLE UPON REQUEST  
CONTACT 206-296-1655 OR TTY 206-296-1024**

## **INTRODUCTION**

Attached is the ninth quarterly *Brightwater Project Construction Phase Oversight Monitoring Consultant Report* prepared by R.W. Beck, the Oversight Monitoring Consultant (OMC), which is prepared and issued under the council-mandated Capital Projects Oversight (CPO) Program in the King County Auditor's Office. It is hereby transmitted to the King County Council Government Accountability and Oversight Committee to provide timely information on the status of the scope, schedule, budget, and risk for the Brightwater project. Oversight is conducted through monthly meetings led by the auditor's office with the project team members from Wastewater Treatment Division (WTD), and representatives from Office of Management and Budget (OMB), the OMC, and council staff. Information has also been obtained through monthly project reports, site visits, and direct contact with WTD staff and project consultants.

The attached OMC report covers the second quarter of 2009, ending June 30. Where more current information is available, it has been included.

## **PROJECT STATUS UPDATE**

### **Scope**

The scope of the final project has not changed; however, plans are underway to allow for startup of the treatment plant prior to the completion of the conveyance system. This change was made so that wastewater can be pumped to the treatment plant to initiate testing and operation to minimize delay between completion of construction and close out of the treatment plant construction contracts. This will involve some design modifications to the influent structure of the influent pump station and use of some of the pipes intended for the reclaimed water system to convey treated flow to the existing county system for a period of time until the new Brightwater conveyance system is completed. This is a reasonable mitigation strategy based on consideration of alternatives to manage the consequences of a conveyance system delay. The detailed cost and schedule implications of this change are under development pending receipt of detailed responses from the contractor on the influent structure design modifications.

There is a firm cost commitment of \$148.7 million for mitigation activities established by various agreements. In the event that there are actual cost savings or cost overruns in any of the mitigation projects or activities, the scope of uncompleted projects will need to be adjusted. Therefore, the final scope of all the mitigation projects will not be known until later. Favorable bidding conditions in the last quarter have resulted in anticipated cost savings in excess of \$2 million on one of the final mitigation projects to be bid. The mitigation projects selected to use these savings will be reported in the future.

### **Schedule**

The date for hydraulic completion of the treatment plant is February 21, 2011 and is unchanged from last quarter. This reflects the addition of 23 days awarded to the contractor for weather-related delays.

The OMC's previous quarterly report showed a 191-day delay in the overall critical path on the project with a projected date to begin treating wastewater of mid-September 2011. Concerns about conveyance schedule delays have increased substantially since the last report, predominantly because of delays in mining on the Central Tunnel contract. The stoppage of both Central Tunnel boring machines for extensive repair work will result in several months of additional delay and increased divergence between the treatment plant and conveyance schedules. In response to the Central Tunnel delay, the influent

structure design is being modified to allow build-out of the influent structure and system testing independent of the Central Tunnel schedule. This redesign will also modify WTD's approach to startup and commissioning of the treatment plant by directing treated effluent through existing lines to the South or West Point Treatment Plants. This proposed revised sequence of work will redirect the critical path from Central Tunnel mining and influent structure construction to the ongoing construction of the Influent Pump Station and system startup. Anticipated treatment plant start-up is now in August 2011, approximately one month sooner than reported last quarter based on the original project sequencing.

At this time WTD is awaiting submittals of contractors' proposed revised schedules that address design modifications to the influent structure and the Central Tunnel boring machine repairs and resumed mining. Upon WTD review and acceptance of these schedules, and incorporation into the master project schedule, WTD will provide a new forecast date for completion of the conveyance system. The project schedule available at this time shows the earliest possible conveyance system completion as mid-2011.

## **Budget**

The current cost estimate for the project is presented as a range between \$1,800 and \$1,844 million in the 2009 Trend Report prepared by WTD and provided to council in May. At that time, WTD presented the lower number of the range as the most probable outcome, which is approximately \$10 million higher than the baseline cost estimate with 5 percent inflation. \$41 million of the \$44 million range is a potential exemption from sales tax on the portions of project costs associated with the production of biosolids and reclaimed water for resale. There is no progress to report this quarter on WTD efforts to gain approval of this sales tax exemption.

The OMC's current cost estimate is presented as a range from \$1,821 to \$1,874 million. The OMC confirms that they believe their estimate more likely represents the outcome of the project costs. Under normal conditions, WTD would prepare a comprehensive project cost estimate update with the 2010 Trend Report in late spring 2010. The OMC is recommending that WTD provide the council with an updated opinion of the project costs sooner, shortly after the receipt of a revised schedule from the IPS contractor for work on the redesigned influent structure.

## **Issues and Risks**

The current risks for the project are listed on the cover page of this transmittal and discussed in greater detail in the attached OMC report. Concern over the potential cost and schedule impacts resulting from these risks has heightened significantly since the last quarter. The focus of oversight has shifted to the main risk areas, how WTD is managing and mitigating these risks, and how we can strengthen the effectiveness of our oversight to promote the successful delivery of the project.

## **STRENGTHENING OVERSIGHT EFFECTIVENESS**

With the heightened concern over the delays in the conveyance system schedule and the likelihood of significant disagreement over responsibility for payment of the costs associated with the central tunnel delay, we have clarified our expectations and identified ways to strengthen and improve the effectiveness of our oversight activities. We have informed WTD that they need to provide more timely and comprehensive information to the OMC. We have directed the OMC to focus their attention on the major risk areas on the project, identify areas of deficiency in WTD's follow-up on past recommendations and make new recommendations that are more specific and pointed to protecting the county's interests related to the major risk areas.

We also identified the need for these actions to change the pattern of longstanding concerns and recommendations that have not received adequate attention from WTD. The Central Tunnel delay provides a good example of why this is needed. The OMC first reported concerns and made recommendations about the Central Tunnel progress in their report covering the first quarter of 2008 (issued on June 16, 2008). Each subsequent report reiterated and heightened the level of concern over Central Tunnel delays and expressed the need to address this recommendation with more comprehensive and more proactive risk management activities. WTD's follow-up on the OMC recommendations has not always been complete or at the optimal level that the OMC and our office would have expected, given the magnitude of potential risks to the project and to the county's interests.

We have taken the following actions to strengthen and improve the effectiveness of our oversight:

- met with WTD and project management to communicate our concerns about their less than optimal response to past recommendations and challenges we had encountered to providing effective oversight;
- identified the need for more comprehensive and timely project information from WTD to the OMC;
- suggested efficient ways for WTD to provide additional information with sensitivity to the demands on project staff and the need to maintain communication protocols around sensitive contract matters;
- clarified to the OMC and to WTD that on the matter of the Central Tunnel delay and contract issues, oversight needs to provide an ongoing answer to the following questions:
  - is WTD's project management of the Brightwater Program reasonable given the current and potential risks on the project; and
  - is WTD employing construction management best practices to adequately protect the county's interests?
- clarified our expectations to the OMC for more focused attention on WTD's response to the Central Tunnel risks, including greater involvement of the subconsultant Hatch Mott MacDonald on tunneling issues;
- clarified our expectations that the OMC provide more specific recommendations to WTD and more specific appraisal of the adequacy of WTD response activities to our office and in formal quarterly reports; and
- reprioritized the discussion items in monthly oversight meetings.

WTD has responded with an agreed upon plan for providing improved and timely access to information and OMC attendance at any applicable project meeting. Although available for just three weeks, this has resulted in a greater ability for the OMC to give more substantive reports to the auditor's office and the council and more specific recommendations to WTD.

## **RECOMMENDATIONS**

The OMC report documents WTD's partially complete progress towards addressing previous recommendations. Ongoing discussion of the need for WTD to more fully address the recommendations will occur. In addition the OMC makes four new recommendations at this time:

- WTD should base its staffing resource planning on the assumption that some significant construction problems will arise.
- With respect to the Central Tunnel, WTD should "plan for the worst" and its planning should be more aggressive. This should include (1) dedicating a minimum of one full-time staff person from WTD to work directly with the Prosecutor's Office on this issue well in advance of 11/30/09 deadline for receipt of Contractor's conditional change order documentation; (2) immediately develop a succession plan to backfill this staff person's regular project responsibilities;
- WTD should provide an opinion to the council regarding the current most probable outcome and whether it differs from the \$1.800 billion estimate in the 2009 Trend Report. This should be done

after receipt of updated schedule information from the IPS contractor and should be provided to council within 30 days thereafter.

- WTD should continue its efforts to reduce its unresolved change order backlog.

In addition to the above recommendations, the OMC will provide ongoing specific observations and recommendations to WTD for enhanced activities to consider to more fully protect the county's interests related to confidential contract issues.

## **ACKNOWLEDGEMENTS**

We appreciate the collaborative efforts of WTD and OMB in providing for effective oversight of the Brightwater Treatment System consistent with council intent. Given the increased demands on the Brightwater project team to respond to the project challenges, their responsiveness and willingness to devote additional attention to provide improved access to information for the OMC is to be commended. Oversight is being conducted and this report was prepared by a team from the King County Auditor's Office, including Tina Rogers, Susan Baugh, and Cheryle Broom. The attached report was prepared by R.W. Beck who is under contract with the auditor's office to provide oversight monitoring consulting services.

A presentation of this quarterly report was given to the King County Council Government Accountability and Oversight Committee on September 15, 2009. Should you have questions or comments on the report, please contact Tina Rogers, the Capital Projects Oversight Manager, or Cheryle Broom, County Auditor.

## **DISTRIBUTION**

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cc: Metropolitan King County Councilmembers

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## **ATTACHMENT**

Brightwater Project Construction Phase Oversight Monitoring Consultant Report (Quarter Ending June 30, 2009), R.W.Beck

Brightwater Project Construction Phase  
Oversight Monitoring Consultant Report  
(Quarter Ending June 30, 2009)

King County  
Brightwater Project Oversight Services  
Contract No. P43024

Final as of September 17, 2009



In association with:





Brightwater Project Construction Phase  
Oversight Monitoring Consultant Report  
(Quarter Ending June 30, 2009)

King County  
Brightwater Project Oversight Services  
Contract No. P43024

Final as of September 17, 2009



In association with:



Hatch Mott  
MacDonald



# Brightwater Project Construction Phase Oversight Monitoring Consultant Report

Quarter Ending June 30, 2009

Final as of September 17, 2009

## Table of Contents

<b>Executive Summary .....</b>	<b>ES-1</b>
Key Findings .....	ES-1
Conclusions and New OMC Recommendations.....	ES-2
<b>Brightwater Quarterly Report.....</b>	<b>1</b>
Background.....	1
Analysis and Findings.....	3
Major Risk Issues .....	9
Progress on Previous OMC Recommendations .....	10
Conclusions and New OMC Recommendations.....	11
<b>Appendix A Summary of Outstanding Recommendations from Previous Reports .....</b>	<b>A-1</b>

## List of Tables

Table ES-1. Total Estimated Project Costs (nominal \$million).....	ES-1
Table 1. Estimated Project Costs (nominal \$million).....	4
Table 2. Construction Progress and Change Order Summary by Contract.....	6

This report has been prepared for the use of the client for the specific purposes identified in the report. The conclusions, observations and recommendations contained herein attributed to R. W. Beck, Inc. (R. W. Beck) constitute the opinions of R. W. Beck. To the extent that statements, information and opinions provided by the client or others have been used in the preparation of this report, R. W. Beck has relied upon the same to be accurate, and for which no assurances are intended and no representations or warranties are made. R. W. Beck makes no certification and gives no assurances except as explicitly set forth in this report.

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Brightwater Project Construction Phase  
Oversight Monitoring Consultant Report  
Quarter Ending June 30, 2009

Final as of September 17, 2009

## Executive Summary

This Executive Summary presents highlights of the Oversight Monitoring Consultant's (OMC's) quarterly briefing on the Brightwater Project. This report covers the period through June 30, 2009, but is supplemented by more current information where available.

### KEY FINDINGS

#### Cost

Estimated costs are shown in Table ES-1. This table, unchanged from our previous Quarterly Report<sup>1</sup>, shows previous baseline estimates, the Wastewater Treatment Division's (WTD's) *2009 Trend Report* Estimate, and OMC's estimate based on the OMC's review of WTD's *2009 Trend Report*

**Table ES-1. Total Estimated Project Costs (nominal \$million)**

	WTD 2004 Baseline		WTD 2009 Trend	OMC Estimate Based on Review of 2009 Trend
	3% Infl.	5% Infl.		
Conveyance	\$1,021 -	\$1,106	\$921 - \$955	\$929 - \$967
Treatment Plant	\$640 -	\$684	\$879 - \$890	\$892 - \$907
<b>Total</b>	<b>\$1,660 -</b>	<b>\$1,790</b>	<b>\$1,800 - \$1,844</b>	<b>\$1,821 - \$1,874</b>

Note: Totals may not add up due to rounding to nearest \$1 million. Table prepared for Quarterly Report published on May 15, 2009.

As reported earlier, the range reported by WTD in its *2009 Trend Report* (published in May 2009) is primarily due to uncertainty regarding receipt of a \$41 million sales tax exemption. WTD stated at that time that the low end of this range represents the most probable outcome based on current assumptions and known uncertainties.

OMC's most recent update, from our previous Quarterly Report, is a range of \$1,821 million to \$1,874 million. Given project developments since May, OMC believes its most recent cost estimate range remains appropriate.

<sup>1</sup> Oversight Monitoring Consultant Report for the Quarter Ending March 31, 2009, published May 15, 2009.

## Schedule

The two Central Tunnel boring machines (TBMs) are currently stopped for extensive maintenance involving repairs to the cutterhead structural rim. The Central Tunnel contract is substantially delayed, enough so for WTD to develop alternate plans (including modifications to the Influent Pump Station's Influent Structure) that allow the wastewater treatment plant to begin operation before the Brightwater Conveyance system is complete. Initially, treated effluent will be discharged to the existing collection system, followed by discharge through the Marine Outfall after the Brightwater Conveyance system is complete. There are a number of advantages to this alternate plan, including eliminating the significant gap between wastewater treatment plant substantial completion and startup that would exist if startup occurred after Conveyance system completion.

WTD currently estimates initiation of wastewater treatment in August 2011, with discharge of treated effluent to the existing collection system. The schedule for discharge of treated effluent through the Brightwater Conveyance system to the marine outfall is not yet known, and depends on the anticipated September 2009 receipt of schedule information from the IPS contractor. The only available estimate shows the earliest possible Conveyance completion as mid-2011, which could slip for a number of reasons, including longer than anticipated repair duration, the need for significant additional maintenance stops, and receipt of schedule information from the IPS contractor.

## Risks

OMC's opinion is that the biggest risks to cost and schedule, going forward are that:

- After BT-2 and BT-3 mining resumes, additional BT-2 and BT-3 TBM repairs may be required that could result in additional extensive down time.
- There is a substantial risk of a disagreement between the Central Tunnel contractor and WTD over responsibility for the significantly higher costs on the Central Tunnel.

## CONCLUSIONS AND NEW OMC RECOMMENDATIONS

### Many Project Components are Going Well

Construction of many of the Brightwater construction contracts is substantially on schedule and anticipated end-of-job change order amounts are within reasonable industry levels. Examples of Brightwater components going well include the Marine Outfall, Liquid Stream of treatment plant to date, the West Tunnel to date, and (particularly after early TBM challenges were overcome) the East Tunnel.

### WTD Should Anticipate a Major Central Tunnel Dispute

Central Tunnel construction is not going well. Based on OMC's observations to date, OMC's opinion is that:

- WTD's management of the Central Tunnel appropriately focuses on completing the actions necessary to get mining resumed and complete the project.
- There is a substantial likelihood of a difference of opinion between WTD and the contractor over the responsibility for the significantly higher project costs and WTD recognizes this.
- WTD has taken proactive steps to protect the county's interests in anticipating that a dispute with the Contractor leading to a formal Dispute Review Board hearing, arbitration and/or trial is possible.
- WTD's approach to protecting the county's interests in anticipation of a substantial dispute with the Central Tunnel Contractor contains many proactive steps but should ultimately be more aggressive. OMC recommends that WTD "plan for the worst" in its preparation.

Issues related to major disputes on large construction contracts are sensitive, and in our oversight role, we have met with WTD and legal counsel to discuss sensitive issues. To protect the county's interests, any observations or specific recommendations we may have regarding confidential issues are not included in this report, but will be provided to WTD project staff on an ongoing basis according to agreed-upon communication protocols.

### WTD has been too Optimistic in its Approach to Resource Planning and Deployment

At times, WTD's delayed deployment of resources to manage potential major construction contract deviations appears to be based on overly optimistic assumptions of favorable outcomes. As problems materialize, WTD will react accordingly from an optimistic baseline. We feel this is particularly true in its approach to using WTD staff and contingency planning. We recommend that WTD base its staffing resource planning on the assumption that some significant construction problems will arise.

### Project Cost Estimate Continues to be Optimistic

OMC believes that WTD has been optimistic in its estimates of the project cost contained in the last three Trend Reports. While we feel that a complete revision of the project cost estimate is not warranted, we believe that WTD should provide an opinion to the Council regarding the current most probable outcome and whether it differs from the \$1.800 billion estimate in the *2009 Trend Report*. This opinion should be developed after revised schedule information is available from the IPS contractor, and should be provided to Council within 30 days thereafter.

### Vigilant Attention to Change Order Resolution May be Beneficial

WTD should remain vigilant to ensure change orders and claims get proper and timely attention. Unless specifically strategically justified, WTD should continue its efforts to reduce its unresolved change order backlog.

### New Recommendations

- We recommended that WTD base its staffing resource planning on the assumption that some significant construction problems will arise.
- With respect to the Central Tunnel, WTD should “plan for the worst” and its planning should be more aggressive. This should include (1) dedicating a minimum of one full time staff person from WTD to work directly with the Prosecutor’s Office on this issue well in advance of 11/30/09 deadline for receipt of the Contractor’s conditional change order documentation; (2) immediately develop a succession plan to backfill this staff person’s regular project responsibilities.
- WTD should provide an opinion to the Council regarding the current most probable outcome and whether it differs from the \$1.800 billion estimate in the *2009 Trend Report*. This should be done after receipt of updated schedule information from the IPS contractor and should be provided to Council within 30 days thereafter.
- WTD should continue its efforts to reduce its unresolved change order backlog.

# Brightwater Quarterly Report

## BACKGROUND

This report is a briefing on the Brightwater Project provided by the Project's Oversight Monitoring Consultant (OMC). This report is based on the most current information available as of early September 2009, which includes: construction cost information through July 31, 2009; non-construction cost information through June 30, 2009; tunnel mining progress through August 29, 2009; schedule information through June 30, 2009; and certain other cost, schedule, and construction progress data through August 31, 2009 that was obtained from meetings with WTD staff.

The OMC's previous Quarterly Report was dated May 15, 2009, and covered the period through March 31, 2009, and it contained the OMC review of WTD's *2009 Trend Report*.

### Conveyance

- Mining for the West Tunnel (BT-4) continues to be on or slightly ahead of plan. As of August 29, 2009, approximately 65 percent of the mining is complete. The tunnel boring machine (TBM) is working through the areas of high water pressures, which are expected to be the most challenging portions of the mining under this contract. The machine was stopped in late August and early September for maintenance and replacement of cutter head tools, and has since resumed mining.
- The westbound Central Tunnel BT-3 mining has been suspended since early June to complete repairs to the cutterhead structural rims. Currently, WTD is working with the contractor to secure permits to dewater the area around the TBM, which will allow the contractor to make the necessary repairs. This dewatering is intended to reduce the water pressure around the TBM and reduce the time required to make the repairs. Because permitting is taking longer than expected to occur, the estimated December 2009 date for resumption of mining may slip. BT-3 mining remains approximately 49 percent complete.
- The BT-3 TBM is currently approximately 300 feet from the expected dewatering site. During mining to reach the site, the contractor has agreed to test the use of a polymer slurry that is an integral part of the tunneling process. The agreement to test a polymer slurry is the result of a three-day workshop in July attended by WTD, the contractor, and technical experts with tunneling and slurry plant operations expertise. The mining and polymer test would occur after permits for the dewatering site have been secured and exploratory boreholes have been drilled confirming that the site is good for dewatering.
- The eastbound Central Tunnel BT-2 mining is also suspended to complete cutterhead structural rim repairs. Dewatering is in progress, and repairs are

expected to begin when dewatering is complete. Because dewatering is taking longer than expected to occur, the estimated October 2009 date for resumption of mining may slip. BT-2 mining remains approximately 66 percent complete.

- WTD and the contractor are planning for one additional BT-2 maintenance stop, possibly involving dewatering, prior to mining below North Creek and the I-405 crossing. WTD is planning to obtain permits ahead of time, so that if this stop becomes necessary, the risk of additional schedule delay is reduced.
- The East Tunnel contractor has completed the installation 27-inch, 48-inch, and 66-inch piping from the conveyance portal located at the treatment plant site. Installation of the 84-inch pipe is underway. The contractor is now preparing to fill the remaining space in the tunnel with concrete after the pipe installation is complete.
- The Influent Structure (IS) within the IPS site is being redesigned to enable startup of the wastewater treatment plant, with discharge to the existing collection system, without waiting for completion of the Conveyance system. The redesign is complete, and the Kiewit Pacific Company (the IPS contractor) is currently revising its construction schedule and preparing cost documentation to be part of a future change order.
- Excavation for the IPS Generator Building and the Underground Storage Tank was underway in July, as was concrete placement inside the IPS. Construction activity inside the Influent Structure (IS) also continues.

#### Treatment Plant

- Construction of Liquids Stream facilities is 63 percent complete as of July 31, 2009, as measured by milestone based payments to Hoffman (liquids GC/CM contractor). Concrete placement is essentially done on the headworks, grit removal system, primary treatment, and aeration basins. Concrete placement is ongoing at other locations. Mechanical and electrical work is ongoing. Groundbreaking for the Environmental Education and Community Center was on September 10, 2009.
- Construction of Solids Stream facilities is 37 percent complete as of July 31, 2009, as measured by milestone based payments to Kiewit Pacific (solids contract). Concrete on the digesters and odor control buildings continues; covers of three of the four digesters were poured in August. Underground piping and electrical conduit installation continues. Major equipment deliveries continue, including the centrifuges.
- Challenges with instrumentation hardware coordination are beginning to arise. The Hoffman and Kiewit Pacific staffs are working with WTD and their consultants to resolve these issues.

## Startup Planning

WTD reports the following status of startup planning activities:

- Continued work with contractors to schedule completion of punch-list items for the Functional Acceptance Testing performed in San Diego and continued development of a plan to assemble control room equipment to allow system control strategies to be tested.
- Continued development of contingency plan details related to hydraulic flow and control strategies required for waste water commissioning without benefit of the Conveyance system.
- Ongoing progress on obtaining O&M staffing are on schedule and training is underway.
- Work on the Brightwater Electronic Operations Manual is on schedule and should be 60 percent complete by end of 2009.
- Contractor submittals regarding startup planning and detailed component testing are coming in. Quality of submittals has been good to date.
- Contractor submittals regarding vendor equipment are increasing at an appropriate rate.

OMC remains of the opinion that WTD's startup planning activities are proactive and continue to progress well.

## ANALYSIS AND FINDINGS

### Cost

WTD's most recent cost estimate was included in its *2009 Trend Report*, and the most recent Quarterly Report contains our review and cost estimate. Table 1, unchanged from our previous Quarterly Report, shows previous baseline estimates, WTD's *2009 Trend Report* Estimate, and OMC's estimate based on the OMC review of WTD's *2009 Trend Report*.

**Table 1. Estimated Project Costs (nominal \$million)**

	WTD 2004 Baseline		WTD 2009 Trend	OMC Estimate Based on Review of 2009 Trend
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Total	\$1,660 -	\$1,790	\$1,800 - \$1,844	\$1,821 - \$1,874

Note: Totals may not add up due to rounding to nearest \$1 million. Table prepared for Quarterly Report published on May 15, 2009.

The range reported by WTD in its *2009 Trend Report* is primarily due to uncertainty regarding receipt of a \$41 million sales tax exemption related to materials & equipment associated with the manufacturing of reclaimed water and biosolids (M&E exemption). WTD states that the low end of this range represents the most probable outcome based on current assumptions and known uncertainties.

OMC's most recent update, based on May 2009 review of WTD's *2009 Trend Report*, is a range of \$1,821 million to \$1,874 million. The primary reasons for this difference were that (1) the OMC believed it is appropriate, for budgeting purposes, to consider the possibility that the M&E exemption will not be approved (or will be available but at some amount less than WTD's estimate), and (2) the OMC believed that WTD's project contingencies are low. Given project developments since May 2009, OMC believes its most recent cost estimate range remains appropriate.

WTD, along with its legal counsel are preparing for discussions with the State Department of Revenue. WTD anticipates resolution of the M&E exemption in late 2010.

#### **Most of the Buyout Savings Have Been Returned to the County**

Buyout Savings are part of the GC/CM contract for the Treatment Plant liquid stream, and they represent the cumulative difference between the negotiated Maximum Allowable Construction Cost (MACC) and the actual bids awarded to subcontractors. Based on contract provisions, \$20,871,039 of Buyout Savings were returned to the county in June 2009. This was done via a deductive change order which reduced the Guaranteed Construction Cost. This return of Buyout Savings was anticipated by WTD in its *2009 Trend Report* and by OMC in its review of the *2009 Trend Report*.

#### **Remaining Buyout Savings total \$6.4 Million**

As of August 24, 2009, the remaining buyout savings totaled \$6.4 million. Of this amount, approximately \$3.8 million is associated with the Environmental Education and Community Center and the site Landscaping buyout that occurred between January and July 2009. The EECC and Landscaping are mitigation projects, and the mitigation budget for the entire Brightwater Treatment System is fixed. As a result, any reduced cost of the EECC and Landscaping resulting from favorable buyout will be offset by an increase in mitigation spending for additional mitigation facilities.

Therefore, while the amount of buyout savings (and therefore the amount returned to the county) may be as high as \$6.4 million, the amount of savings to the project is considerably less (up to approximately \$2.6 million<sup>2</sup>). The maximum amount of Buyout Savings that can be returned to the county (net of the cost of increased mitigation scope) is approximately \$23.5 million (\$20.9 that has been returned plus a potential for up to \$2.6 million more). Future use of buyout savings would lower this amount. WTD, in its *2009 Trend Report*, assumed that approximately \$24.9 million would be returned. This difference would need to be covered by WTD's contingencies and should be reflected in any updated cost estimates that WTD prepares.

### **Change Order Status**

The most recent claim and change order data is from WTD's July 31, 2009, construction reports, and is as follows:

- Conveyance construction progress is approximately 67 percent, measured as percent of contract value earned by construction contractors, while excluding the recent Conditional Change Order on the Central Tunnel (described below), executed Conveyance change orders are approximately 25 percent of WTD's conveyance construction contingency. Including pending (costs negotiated but not executed) and estimates of potential (costs not yet negotiated) change orders could increase this to a maximum of about 66 percent.
- In July, WTD and the Central Tunnel contractor executed a conditional change order for approximately \$17.8 million. Under this change order, WTD will pay the Central Tunnel contractor for certain costs specified in the change order that are incurred before September 30, 2009. However, the ultimate responsibility for payment will be decided later. If it is determined that the contractor is entitled to recover less than what is paid under the Conditional Change Order, the contract price will be adjusted by a deductive change order.
- Treatment Plant construction progress is approximately 52 percent, measured as percent of contract value earned by construction contractors, while executed Treatment Plant change orders are approximately 17 percent of WTD's construction contingency. Including pending and estimates of potential change orders could increase this up to a maximum of about 23 percent.

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<sup>2</sup> \$2.6 million equals buyout savings as of 8/24/09 of \$6.4M less \$3.8M associated with mitigation.

Table 2 summarizes, for each of the major construction contracts, construction progress described by payments to contractors, the amount of executed change orders, and change orders as a percent of amount paid to the contractor. Table 2 excludes the Central Tunnel Conditional change order because ultimate payment responsibility has not yet been determined.

**Table 2. Construction Progress and Change Order Summary by Contract**

Major Construction Contract	Original Contract Value, \$M (1)	Amount Paid to Contractor \$M, (2)	Percent Construction Complete (2) (3)	Executed Change Orders (3) (4)	
				\$M	% of Amt Paid
Marine Outfall	\$27.6	\$29.6	99%	\$2.2	7%
West Tunnel	\$102.5	\$78.4	72%	\$6.0	8%
Central Tunnel	\$211.1	\$146.1	68%	\$3.4	2%
East Tunnel	\$130.8	\$116.8	86%	\$5.0	4%
IPS	\$91.9	\$15.5	17%	\$2.2	14%
Liquids Stream	\$299.6	\$191.3	63%	\$3.5	2%
Solids Stream	\$166.5	\$62.0	37%	\$1.3	2%

(1) Includes comparatively small amounts of non-Brightwater facilities in the Central and West Tunnels and therefore will differ slightly from costs in WTD's 2009 Trend Report. For the Liquids Stream, it represents the Guaranteed Construction cost including North Mitigation Area, Site Work, Liquids, EECC, and Landscaping, less buyout savings returned to the County.

(2) Measured by Milestone-Based Payments to Contractors. Amount paid divided by sum of original contract value plus executed change orders

(3) As of July 31, 2009

(4) Excludes conditional change order with Central Tunnel contractor.

Table 2 indicates that executed change orders, as a percent of the amount paid to contractors, are generally within industry norms. An exception is the IPS, where there have been comparatively high amount of change order activity given the progress to date.

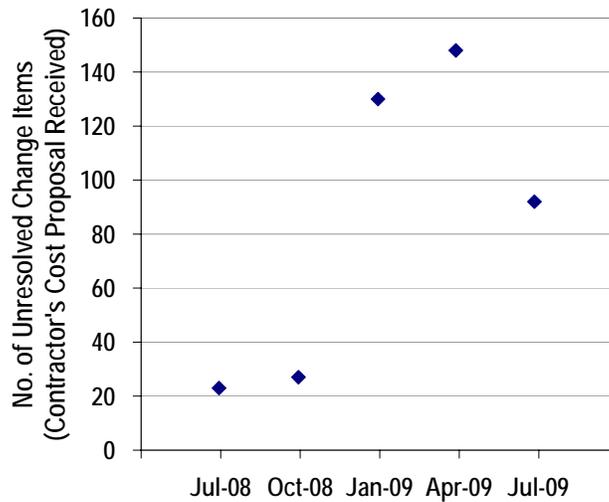
There is a comparatively high dollar amount of change order requests that have been submitted by contractors and are at various points in WTD's evaluation and negotiation process. The more significant of these potential change orders are briefly described as follows:

- West Tunnel - related to the late delivery of the TBM;
- Central Tunnel- related to slower than anticipated mining progress;
- East Tunnel - several items related to tunnel construction; and
- Influent Pump Station - related to the slower than anticipated Central Tunnel mining progress and its impact on the IPS construction schedule.

In addition to Requests for Change Orders (RCO) already submitted by the Central Tunnel related to BT-2 and BT-3 mining, the Central Tunnel contractor has a November 30, 2009 deadline to substantiate costs related to the Conditional Change Order. OMC also anticipates additional future RCO submissions by the Central Tunnel contractor. At this time, it is not possible to estimate the dollar amount in change orders that WTD will be required to pay associated with Central Tunnel mining.

OMC is concerned about what it perceives to be a large number of unresolved change order requests. Buildup of unresolved change orders can add risk to the county by increasing the staff workload at the end of the projects while the pressure to complete the projects is the greatest. This could result in some change order requests not receiving proper attention in an attempt to close out project contracts. To our knowledge, WTD currently meets its contractual requirements in processing change order requests. WTD indicates that it has added resources to increase its capacity to resolve change orders.

Figure 1 shows the number of unresolved change items<sup>3</sup> on a quarterly basis from July 2008 through July 2009. The decrease observed in between April and July 2009 corresponds to WTD's report of added resources.



**Figure 1. Number of Unresolved Change Items**

**Contingency Review**

In its *2009 Trend Report*, WTD reported total construction and project contingencies, combined of approximately \$95 million. OMC's *2009 Trend Report* review stated that construction contingencies were generally thought to be reasonable, but the project

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<sup>3</sup> Change item refers to contractor-initiated requests for change orders and owner-initiated requested cost proposals that have yet not been negotiated into a change order.

contingencies<sup>4</sup> were thought to be low. WTD's project contingencies for the Conveyance system and the Treatment Plant, combined, were \$4 million, and OMC recommended a range of \$20 to \$32 million.

Subtracting the value of executed and pending change orders since January 1, 2009, WTD's total construction and project contingencies remain at approximately \$86 million. While this is a significant amount of contingency given current construction progress, these contingencies must cover the following:

- All remaining executed change orders. Currently, the estimated cost of change orders that have either been submitted or are expected<sup>5</sup> is over \$33 million. OMC anticipates additional large requested change orders for the Central Tunnel (as described above), the IS redesign, and other issues that arise during the remainder of construction. Typically, change order activity is higher in the last half of the job than the first half.
- All future use of the MACC contingency.
- As described above, the difference between the actual amount of buyout savings returned to the county at the end of the job and what was assumed in the *2009 Trend Report* (currently \$1.5 million, which will increase as buyout savings are used in the future).
- The difference, if any, if the M&E exemption WTD receives is less than the approximately \$41 million assumed by WTD in the *2009 Trend Report*.
- Non-construction costs that exceed those anticipated in the *2009 Trend Report*, including additional non-construction costs that may result from schedule delays observed since the *2009 Trend Report* was prepared.

Based on project developments since the preparation of our *2009 Trend Report Review*, the OMC believes that its project cost estimates and conclusions made at that time are still appropriate.

## Schedule

### **Conveyance Schedule Evaluation is Deferred**

It is not known when mining will resume at BT-2 and BT-3. Mining progress and the frequency and extent of TBM maintenance after mining resumes are also not known. For these reasons, OMC does not have a schedule evaluation in this monthly report.

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<sup>4</sup> Project contingencies are intended to cover non-construction risks, including engineering and construction management.

<sup>5</sup> This includes the Requested Change Orders submitted by the contractor and Requested Cost Proposals initiated by WTD (both of which are subject to negotiation), anticipated change items where the contractor has provided a notice of intent to submit a RCO, RCOs that the county has denied and the contractor has appealed, and Contractor claims. This does not include the Central Tunnel conditional change order.

WTD's most recent Conveyance Construction Monthly Report contains an estimate prepared by WTD of Conveyance system completion in mid-2011. The critical path for Conveyance system completion is through IPS construction. However, BT-3 delays beyond what is currently estimated by WTD could change the critical path to BT-3 construction.

WTD's current estimate, however, is not based on schedule information from the IPS contractor (still under development because of the IS redesign), and does not yet incorporate longer than anticipated dewatering on BT-2 and permitting on BT-3. This mid-2011 completion date also has the potential to slip if significant additional maintenance stops are required.

OMC believes that the Conveyance project schedule will change substantially in upcoming months as IPS contractor schedule information is available, BT-2 dewatering and repairs commence, and BT-3 permitting, dewatering, and repairs commence. For these reasons, a detailed Conveyance schedule evaluation is being deferred until (at a minimum) IPS contractor schedule information is available.

#### **Treatment Plant Remains on Schedule**

The schedule for hydraulic completion of the Treatment Plant has not changed substantially within the last six months. Since January 2009, substantial completion of both the liquids and solids phases has been delayed between 10 and 20 days, and as of July 31, 2009, was February 21, 2009 for both liquids and solids contracts. Since January 2009, 21 and 23 weather related contract days were added to the liquids and solids contracts, respectively. The observed schedule slippage between January 2009 and July 2009 is due to these weather-related days.

## **MAJOR RISK ISSUES**

Looking forward, major conveyance cost and schedule risk issues include:

- After BT-2 and BT-3 mining resumes, additional BT-2 and BT-3 TBM repairs may be required that could result in additional extensive down time.
- BT-3 TBM repairs are not yet initiated. The dewatering strategy is not yet permitted.
- After it resumes, BT-3 mining enters what WTD considers the most challenging soil conditions of the entire project, with high water pressures and 900 lineal feet of squeezing soils.
- BT-2 TBM repairs could take longer than anticipated to complete.
- BT-4 is mining through the areas high water pressure, which is considered a more difficult mining environment.

- Other unforeseen tunneling conditions and delay risks remain possible.
- There is a substantial risk of a disagreement between the Central Tunnel contractor and WTD over responsibility for the significantly higher costs on the Central Tunnel.

Major treatment plant cost and schedule risk issues include:

- Coordination and integration of work under three different prime contractors at the Treatment Plant site. This ongoing issue to date has not resulted in schedule slippage or increased cost to WTD.
- Delivery of equipment, completion of instrumentation and control (I&C) activities, and treatment plant startup. These risks are common to all wastewater treatment plant projects and WTD has been proactive in addressing any potential issues that have arisen to date.
- An emerging risk is related to observed delays in receiving I&C submittals for both liquids and solids portions of the treatment plant. WTD is aware of these issues and is working with appropriate contractors to address them. At this time this issue is not causing a schedule delay, but the risk of one is increasing.

## **PROGRESS ON PREVIOUS OMC RECOMMENDATIONS**

From May 2009 Quarterly Report

Recommendations in the May 2009 Quarterly Report were related to (1) earlier use of available resources to ensure WTD's risk assessments are more comprehensive, more quantitative, and completed earlier, and (2) designation of a WTD staff member with ownership of risk management efforts. Refer to Appendix A for specific wording from our May 2009 Quarterly Report.

### OMC Assessment of WTD Progress

Implementation of the OMC's recommendations is partially complete. WTD has taken several steps to more appropriately address risk management issues. These steps include:

- Establishing a project-specific risk register, updating it weekly, and distributing it to key staff.
- Allowing OMC greater access to sensitive documents and meetings that allow OMC to more accurately assess OMC's risk management issues. This is an important consideration in the OMC's ability to provide effective oversight. WTD does many activities that assess and manage risk but does not typically compile this information into any specific risk management program based on what the OMC has observed to date.

- Providing OMC a look-ahead calendar identifying significant meetings for potential OMC attendance. This will also allow OMC to more accurately assess WTD activities.
- Provided up to date organizational charts.
- Developing a succession plan for key WTD project staff (in progress).

OMC has very much appreciated WTD's responsiveness in providing this information.

WTD indicates that the Brightwater Project Manager has ownership of WTD's risk management efforts, and this was true when our recommendation was made. OMC believes it is appropriate for the Brightwater Project Manager responsibilities to ensure that risk management efforts are completed. Further, OMC believes it is possible for the Brightwater Project Manager to also own risk management effort, provided other staff are available to complete the detailed work. We remain of the opinion, expressed in our previous quarterly report, that risk assessments should be more comprehensive, more quantitative, and completed earlier.

WTD increases its use of consultants to address cost and schedule risk, but has stated a "lean and mean" approach to use of WTD staff. OMC feels WTD is somewhat rigid in adherence to this staffing approach, and believes this staffing approach may increase the county's risk because it prevents WTD from devoting adequate WTD resources to proactively managing out-of-the-ordinary risk issues, such as the Central Tunnel progress.

#### From April 2009 Quarterly Report

The one recommendation from this report related to improved access to and content of change order documentation. Refer to Appendix A for specific wording from our April 2009 Quarterly Report.

#### OMC Assessment of WTD Progress

Implementation of the OMC's recommendation is mostly complete. WTD has been very responsive in providing change order documentation to OMC when requested. However, OMC has not seen a comparison of requested and executed change order amounts.

## **CONCLUSIONS AND NEW OMC RECOMMENDATIONS**

#### Many Project Components are Going Well

Construction of many of the Brightwater construction contracts is substantially on schedule and anticipated end-of-job change order amounts are within reasonable industry levels. Examples of Brightwater components going well include the Marine

Outfall, Liquid Stream of treatment plant to date, the West Tunnel to date, and (particularly after early TBM challenges were overcome) the East Tunnel.

#### WTD Should Anticipate a Major Central Tunnel Dispute

Central Tunnel construction is not going well. Based on OMC's observations to date, OMC's opinion is that:

- WTD's management of the Central Tunnel appropriately focuses on completing the actions necessary to get mining resumed and complete the project.
- There is a substantial likelihood of a difference of opinion between WTD and the contractor over the responsibility for the significantly higher project costs, and WTD recognizes this.
- WTD has taken proactive steps to protect the county's interests in anticipating that a dispute with the Contractor leading to a formal Dispute Review Board hearing, arbitration and/or trial is possible.
- WTD reports it is isolating all county costs associated with the Central Tunnel delay, though OMC has yet not reviewed any of this cost documentation.
- WTD's approach to protecting the county's interests in anticipation of a substantial dispute with the Central Tunnel Contractor contains many proactive steps but should ultimately be more aggressive. OMC recommends that WTD "plan for the worst" in its preparation.

Issues related to major disputes on large construction contracts are sensitive, and in our oversight role, we have met with WTD and legal counsel to discuss sensitive issues. To protect the county's interests, any observations or specific recommendations we may have regarding confidential issues are not included in this report, but will be provided to WTD project staff on an ongoing basis according to agreed-upon communication protocols.

#### WTD has been too Optimistic in its Approach to Resource Planning and Deployment

At times, WTD's delayed deployment of resources to manage potential major construction contract deviations appears to be based on overly optimistic assumptions of favorable outcomes. As problems materialize, WTD will react accordingly from an optimistic baseline. We feel this is particularly true in its approach to using WTD staff and contingency planning. This may turn out to be cost-effective if the contract issue resolves itself well. However, if things do not go well, WTD is at risk of not deploying sufficient resources in a timely and proactive manner to address problematic issues and optimally protect the county's interests. We recommend that WTD base its staffing resource planning on the assumption that some significant construction problems will arise.

### Project Cost Estimate Continues to be Optimistic

OMC believes that WTD has been optimistic in its estimates of the project cost contained in the last three Trend Reports. While we feel that a complete revision of the project cost estimate is not warranted, we believe that WTD should provide an opinion to the Council regarding the current most probable outcome and whether it differs from the \$1.800 billion estimate in the *2009 Trend Report*. This opinion should be developed after revised schedule information is available from the IPS contractor, and should be provided to Council within 30 days thereafter.

### Vigilant Attention to Change Order Resolution May be Beneficial

WTD should remain vigilant to ensure change orders and claims get proper and timely attention. Unless specifically strategically justified, WTD should continue its efforts to reduce its unresolved change order backlog.

### New Recommendations

- We recommend that WTD base its staffing resource planning on the assumption that some significant construction problems will arise.
- With respect to the Central Tunnel, WTD should “plan for the worst” and its planning should be more aggressive. This should include (1) dedicating a minimum of one full time staff person from WTD to work directly with the Prosecutor’s Office on this issue well in advance of 11/30/09 deadline for receipt of Contractor’s conditional change order documentation; (2) immediately develop a succession plan to backfill this staff person’s regular project responsibilities.
- WTD should provide an opinion to the Council regarding the current most probable outcome and whether it differs from the \$1.800 billion estimate in the *2009 Trend Report*. This should be done after receipt of updated schedule information from the IPS contractor and should be provided to Council within 30 days thereafter.
- WTD should continue its efforts to reduce its unresolved change order backlog.



# Appendix A

## Summary of Outstanding Recommendations from Previous Reports

### **MAY 2009 REPORT (OMC REPORT FOR QUARTER ENDING MARCH 31, 2009)**

#### **FINDINGS AND NEW RECOMMENDATIONS**

Based on the evaluations included in this quarterly report, the OMC makes the following new recommendations:

1. In order to continue to be aggressive in controlling project costs, WTD should make strategic investments to enhance efforts to address cost and schedule risks. These investments should include earlier use of available staff and consultant resources, to ensure WTD's risk assessments are more comprehensive, more quantitative, and completed earlier. This will enhance WTD's ability to:
  - a) Be proactive in anticipating and managing special project issues, such as large cost change items.
  - b) Deal with multiple abnormal simultaneous events.
2. To successfully improve WTD's risk management efforts, WTD should designate a WTD staff member with ownership of these efforts. This ownership should include the responsibility to ensure these efforts are developed, documented and updated, as necessary.

### **APRIL 2009 REPORT (OMC REPORT FOR QUARTER ENDING DECEMBER 31, 2008)**

#### **FINDINGS AND NEW RECOMMENDATION**

Based on the evaluations included in this quarterly report, the OMC make the following new recommendation:

1. WTD should make additional change order documentation available to the OMC per existing communication protocols. Documentation should show how change orders and issues likely to become change orders are categorized and should compare the contractor's original requested change order amount versus negotiated amount once change orders are executed.