

Final Report

## Brightwater Project Construction Phase

Oversight Monitoring Consultant Report  
Combined Quarterly Reports for Quarters Ending  
December 31, 2009 and March 31, 2010

King County  
Brightwater Project Oversight Services  
Contract No. P43024

July 2010



An SAIC Company

In association with:



Hatch Mott  
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# Brightwater Project Construction Phase Oversight Monitoring Consultant Report Combined Quarterly Reports for Quarters Ending December 31, 2009 and March 31, 2010

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# 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 combined quarters ending December 31, 2009 and March 31, 2010, and is supplemented by more recent information where available.

## Key Findings

### Cost

Under separate cover, OMC has reviewed the Wastewater Treatment Division (WTD) 2010 Trend Report<sup>1</sup> Estimate and prepared its estimate of revised project costs<sup>2</sup>.

The updated OMC estimate below shows the non-disputed portion of Brightwater costs as a range from \$1,815 to \$1,856 million, with the range reflecting uncertainty in recovery of the Machinery & Equipment (M&E) sales tax exemption.

Table ES-1: Estimated Project Costs (nominal \$million)

Project Component	WTD Baseline Budget	WTD 2009 Trend Report	WTD 2010 Trend Report	OMC 2009 Estimate	OMC 2010 Estimate
	3% Infl. - 5% Infl				
Conveyance	\$1,020.6 - \$1,105.5	\$921.2 - \$952.9	\$931.6 - \$963.3	\$929.2 - \$966.9	\$919.3 - \$951.1
Treatment Plant	\$639.6 - \$684.4	\$878.6 - \$887.9	\$884.2 - \$893.5	\$892.2 - \$907.5	\$895.2 - \$904.5
Subtotal	\$1,660.2 - \$1,789.9	\$1,799.8 - \$1,840.8	\$1,815.8 - \$1,856.8	\$1,821.4 - \$1,874.4	\$1,814.6 - \$1,855.6

The OMC recognizes there are a number of issues in dispute related to slower than planned BT-2 and BT-3 mining which could impact the ultimate cost of completion. Known disputed costs are approximately \$178 million, and OMC estimates that this could increase to over \$200 million by the end of the project. Known disputed costs include requested change orders (RCOs) and claims on BT-2 and BT-3, certain other change orders on other contracts resulting from BT-2 and BT-3 mining delays, the estimated cost to complete the BT-3 mining, certain non-construction costs, and sales tax. The ultimate outcome and the cost implications of these disputed issues remain uncertain at this time.

This OMC 2010 Estimate Includes Non-Disputed Costs Only

<sup>1</sup> Brightwater Cost Update, Current Conditions and Trends, January 2010

<sup>2</sup> Oversight Monitoring Consultant Report - Review of Brightwater Cost Update, Current Conditions and Trends, January 2010

## Schedule

WTD continues to project that wastewater treatment will begin August 2011, with discharge of treated effluent to the existing collection system. The Treatment Plant substantial completion date has not substantively changed over the past year.

The conveyance schedule continues to be uncertain. WTD's baseline schedule for BT-3C<sup>3</sup> mining assumes TBM modifications continuing through September 2010 and mining completion in September 2011. The remaining critical path items for discharge of Brightwater effluent through the marine outfall are the completion of BT-4 tunnel lining and construction of the effluent sampling station.

## Risks

OMC believes that the biggest risks to cost and schedule are:

- Factors related to project costs that are listed in the OMC 2010 Trend Report Review and described in the main body of this Quarterly Report.
- Uncertainty over the rate at which the JayDee/Coluccio (JDC) tunnel boring machine (TBM) can complete the remaining BT-3 mining.

## Conclusions and Follow-up on Previous OMC Recommendations

### Conclusions

#### Many Project Components Continue To Go Well

The treatment plant and startup schedules have not significantly changed in the past year. The IPS schedule has not changed since it was revised after incorporating the redesigned Influent Structure.

Construction on the liquids and solids phases has remained on schedule for August 2011 startup of the treatment plant with discharge to the existing King County conveyance system and subsequent treatment at the West Point and/or South wastewater treatment plants.

Anticipated treatment plant end-of-job change orders continue to be within reasonable industry levels.

East Tunnel construction is nearing substantial completion. West Tunnel mining has gone well and mining production was faster than anticipated. BT-2 mining was completed on June 22, 2010, ahead of the schedule anticipated at the resumption of mining in February 2010.

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<sup>3</sup> BT-3C refers to the completion of the BT-3 tunnel by the JayDee/Coluccio joint venture.



## Follow-Up to Previous Recommendations

OMC has made several recommendations in previous OMC Quarterly Reports and as part of a presentation to the Government Accountability and Oversight (GAO) Committee in April 2010. These recommendations and follow-up actions for these recommendations are discussed in the main body of the report. WTD has been cooperative in responding to OMC information requests and many questions from the OMC and King County Auditor's Office have been answered satisfactorily. Outstanding items remain, including:

- OMC does not feel that WTD's construction and project contingencies in the 2010 Trend Report appropriately reflect the remaining project risks nor were they assessed with adequate rigor.
- OMC continues to believe that WTD should make additional strategic investments to address cost and schedule risks.

## New Recommendations

New OMC recommendations are shown below and are based on the factors described in the main body of the report related to risk and project cost.

1. WTD should ensure that proper and complete quality assurance/quality control efforts are documented as part of the project's review of Lovat's BT-3C TBM modification designs by staff and/or consultants with TBM design expertise.
2. WTD should continue to assess JDC's progress refurbishing the TBM and mining progress (once it resumes) and proactively develop contingency plans. Contingency plans should include thresholds for taking action. WTD should also ensure that its ongoing BT-3C completion planning include timing of remaining VPFK work, and define the responsibility for connection between the tunneling segments completed by VPFK and JDC.
3. If change orders related to the interval between treatment plant substantial completion and commissioning are required, WTD should consider the effects of conveyance system schedule uncertainty in its negotiation strategies.
4. WTD should dedicate sufficient resources to pursue all ways to manage other project issues that could reduce costs compared with estimates, including: resolution of other outstanding change orders and claims; avoiding delays on other contracts that influence cost, successful start up and commissioning of the treatment plant; an assessment of whether any cost recovery opportunities are available; completing mitigation project commitments; ramp down of project staff and consultant work as construction contracts are closed out; and securing the M&E sales tax exemption.



# Oversight Monitoring Consultant Report

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## Introduction

This report is a briefing on the Brightwater Project provided by the Brightwater Oversight Monitoring Consultant (OMC), working as part of the King County Auditor's Office Capital Project Oversight program. This report is based on the most current information available through the Wastewater Treatment Division's March 2010 Monthly Project Report, supplemented by more current information when available, including: construction cost information through May 31, 2010; tunnel mining progress through early June, 2010; and; and certain other cost, schedule, and construction progress data through early June 2010 that was obtained from meetings with WTD staff.

The OMC's previous Quarterly Report was dated January 26, 2010, and covered the period through September 30, 2009. This Quarterly Reports for the quarters ending December 31, 2009 and March 31, 2010 are combined in this report.

## Project Progress

The following tables illustrate construction activity for the various major construction contracts. They are not intended to be an exhaustive list of construction activity, but instead are intended to illustrate the many types of construction activities that are ongoing.

## Conveyance Construction

### Marine Outfall

Marine Outfall activities since January 1, 2010 are shown in Table 1.

Table 1: Summary of Marine Outfall Activities Since January 1, 2010

Month	Partial List of Construction Activity
January	Continued review of as-builts and O&M manuals. Began to develop the RFP for final outfall survey and diffuser port uncapping.
February	Final payment to Triton was processed. Finished review of as-builts and O&M manuals. Continued to develop the RFP for final outfall survey and diffuser port uncapping.
March and April	Revisions to as-builts and O&M manuals underway based on WTD review. Continued to develop RFP. Final closeout paperwork for the Marine Outfall Contract underway.
May	Hard copy of the as-builts and O&M manuals received; final Contractor progress payment has been processed.

### JCT Contract (West Tunnel and Preparation for BT-3C Contract)

Construction activities completed by JCT are shown in Table 2, which includes West Tunnel construction activities to date, and preparatory work at the Ballinger Way Portal for the BT-3C contract. Table 2 does not include any BT-3C or West Tunnel work that will be completed by JDC<sup>4</sup>. The “Construction Percent Complete” in Table 2 are based on executed change orders as of April 30, 2010.

**Table 2: Summary of JCT Contract Activities Since January 1, 2010**

Month	Partial List of Construction Activity	Construction Percent Complete (1)
January	Mined 1,385 feet. 98 percent of West Tunnel mining complete by end of January.	91%
February	Mined 170 feet; suspended mining for evaluation of BT-3. No additional mining.	91%
March	Work by JCT shifted to BT-3C activities.	91%
April	Executed Change Order 14, for construction activities to be completed by JCT in anticipation of the BT-3C contract, including installation of ground freezing system on east side of Ballinger Way shaft. Executed Change Order 15 to delete remaining West Tunnel work from JCT contract, for future completion by JDC. Certificate of substantial completion issued April 5.	92%
May	Close-out activities on BT-4 continued.	95%

(1) Measured by milestone-based payments to contractors at the end of the month. Percentages based on all work performed by JCT, including all executed change orders related to West Tunnel construction. Excludes value of remaining West Tunnel construction to be completed by JDC. Includes BT-3C work completed by JTC.

### BT-3C (JDC Contract)

BT-3C contract activities are summarized in Table 3, starting when the BT-3C contract was executed. Additional aspects of the BT-3C contract are described later in this report.

**Table 3: Summary of West Tunnel and BT-3C Activities Since January 1, 2010**

Month	Partial List of Construction Activity	Construction Percent Complete (1)
April	Contract executed. Design of TBM modification continued. JDC submitted pay request for lump sum materials.	13% of the contract amount has been invoiced.
May	Continued design of TBM modifications, preparation for TBM repairs, ground freezing at Ballinger Way portal.	16% of the contract amount has been invoiced.

(1) Measured by amount invoiced compared with the initial cost-loaded schedule provided by JDC that reflects September 2011 mining completion and that excludes incentive payments.

<sup>4</sup> JCT refers to the joint venture of JayDee, Coluccio, and Taisei that was awarded the West Tunnel contract. The BT-3C contract was awarded to the joint venture of JayDee and Coluccio (JDC). The remaining West Tunnel construction items have been removed from the JCT contract via change order and are expected to be completed by JDC.

## Central Tunnel

Central Tunnel construction activities since January 1, 2010 are shown in Table 4.

**Table 4: Central Tunnel Activities Since January 1, 2010**

Month	BT-2 (Partial List)	BT-3 (Partial List)	Construction Percent Complete (1)
January	Continued cutterhead repairs.	Mined 50 feet. Awaiting rim bar repairs.	76%
February	Rim bar repair completed; mined 370 feet. 69% of BT-2 mined by end of February.	Reached 53 <sup>rd</sup> Ave Safe Haven. Mined 115 feet; 50% of BT-3 mined. Repairs on hold due to BT-3C evaluation by WTD.	77%
March	Mined 705 feet. 75% of BT-2 mined by end of March.	TBM on standby, awaiting BT-3C evaluation by WTD.	78%
April	Mined 995 feet. 83% of BT-2 mined by end of April. TBM reached Safe Haven 3 on April 21.	TBM on standby.	79%
May	Mined 1985 feet. I-405 and North Creek crossings complete. BT-2 mining complete June 22, 2010.	TBM on standby.	81%

(1) Relates to VPFK's entire Central Tunnel construction contract. Measured by milestone-based payments to contractors at the end of the month. Excludes payment considerations related to conditional change order (further discussion of the conditional change order later in this report).

## East Tunnel

East Tunnel construction activities since January 1, 2010 are shown in Table 5.

**Table 5: East Tunnel Activities Since January 1, 2010**

Month	Partial List of Construction Activity	Construction Percent Complete (1)
January	Grout installation continued, 33% complete. 48- and 66-inch pipes backfilled with CDF.	94%
February	Grout installation continued, 50% complete.	95%
March	Grout installation continued, 73% complete.	97%
April	Grout installation continued, 90% complete.	97%
May	Completed grouting. Completed inspection of 48-inch pipe. Began backfill and landscaping. Began welding of grout holes inside pipes. WTD expects substantial completion in July 2010.	98%

(1) Measured by milestone-based payments to contractors at the end of the month.

## Influent Pump Station

Influent Pump Station construction activities since January 1, 2010 are shown in Table 6.

**Table 6: Influent Pump Station Activities Since January 1, 2010**

Month	Partial List of Construction Activity	Construction Percent Complete (1)
January	Continued placing reinforcing steel for TBM removal chamber. Completed wall and column installation between elevations 85 and 109.	27%
February	Completed installation of auger cast piles for Art Tower Foundation. Began painting Lower Pump Room deck, began wall and column construction at elevation 109.	29%
March	Completed wall and column construction between elevations 109 and 132. Continued construction of Influent Structure and Generator Building exterior walls. Began installation of the Foul Air Exhaust line.	31%
April	Completed slab placement for first floor deck. Continued construction of Generator Building exterior walls and Influent Structure. Began construction of walls and columns between first and second floors, as well as HVAC ductwork.	33%
May	Continued concrete placement. Factory testing of IPS pumps.	40%

(1) Measured by milestone-based payments to contractors at the end of the month.

In 2009 WTD asked the IPS contractor to prepare a change order related to the revised Influent Structure (IS) design. In October 2009 WTD authorized \$1.5 million for initial work. As of May 31, 2010, WTD has agreed to and executed an additional \$4.225 million change order.

## Treatment Plant Construction

### Liquids

A partial list of liquids construction activities since January 1, 2010 is shown in Table 7.

**Table 7: Liquids Contract Activities Since January 1, 2010**

Month	Partial List of Construction Activity	Construction Percent Complete (1)
January	Completed concrete structure work. Continued mechanical, electrical, architectural finish work. Last tower crane removed from site.	74%
February	Completed installation of Membrane building roof, roof framing on Environmental Education Wing of the Environmental Education and Community Center (EECC). Continued mechanical, electrical, architectural finish work. Continued installation of sludge collection, skimmers and launders in the Primary Clarifiers. Began roof framing on Community Center wing of EECC building.	77%
March	Installed overhead bridge cranes in Membrane building, completed epoxy coatings in membrane tanks. Mechanical and electrical work nearing completion. Continued architectural finish work.	79%
April	Transitioning to start-up and testing phase. Completed incoming power distribution system for Aeration and functional start-up checks. Continued framing and roofing of EECC building. Continued finish grading on north end of site.	80%
May	Continued equipment installation, mechanical, and electrical installation.	81%

(1) Measured by milestone-based payments to contractors at the end of the month.

### Solids

A partial list of Solids/Odor Control construction activities since January 1, 2010 is shown in Table 8.

**Table 8: Solids/Odor Control Contract Activities Since January 1, 2010**

Month	Partial List of Construction Activity	Construction Percent Complete (1)
January	Installed duct and HVAC equipment, process pipe in Solids Building between elevations 284 and 300, completed installation of precast panels, Continued piping work, structural and mechanical work on Digesters 1, 2, and 3. Began installation of CMU walls in Digester Building.	65%
February	Completed installation of duct and HVAC equipment in Solids Building between elevations 301 and 320, metal deck pours, fireproofing of electrical room. Continued installation of doors and windows in Solids Building, structural and mechanical work on the Digesters and Energy Building. Began installation of acoustical enclosures in Primaries Odor Control Facility.	69%
March	Installed scrubbers and exhaust stack support towers in Solids Odor Control Facility. Continued roofing, framing and painting in the Solids Building, piping and electrical work in the Digester, Energy and Headworks Buildings.	73%
April	Completed last structural concrete in Digester Facility, HDPE liner in Sludge Storage Tank. Continued architectural, mechanical and electrical work in Solids Building and Digester Facility. Continued electrical and gas work in Energy Building.	76%
May	All major equipment and piping has been installed in Digester Building and Gallery. Work on structural steel painting and external finishing continues. Scrubber installation completed in Solids Odor Control Facility. Work on electrical systems and start-up activities planning continues.	83%

(1) Measured by milestone-based payments to contractors at the end of the month.

## Startup Planning

WTD reports the following status of treatment plant startup planning activities:

- A report evaluating startup alternatives was delivered to Council in April. This is discussed later in this report.
- Component test plans are largely received from contractors and approved by WTD and component testing is scheduled to begin in September 2010.
- System test plans are being received from contractors.
- WTD is negotiating an agreement with Emerson to provide startup services. These services were originally planned to occur via contracts between Emerson and the construction contractors. WTD has decided to contract directly with Emerson for these services.

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



# Analysis and Findings

## Special Topic Discussion

### Introduction

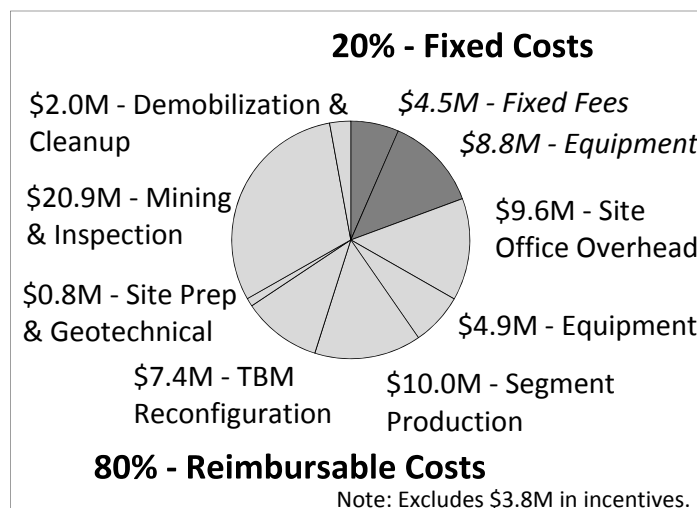
Past OMC Quarterly Reports have contained sequential discussions of cost, schedule, and risk considerations. These discussions are included later in this report. This Special Topic Discussion section contains an update on some project issues that cannot easily be characterized as related to a single cost, schedule, or risk category. Further, the issues described in this Special Topic Discussion section significantly influence the discussions of cost, schedule, and risk.

### JDC Contract Update

On April 12, 2010, WTD and the JayDee/Coluccio Joint Venture (JDC) signed a contract for JDC's completion of the BT-3 mining (BT-3C Contract, where the C denotes completion).

Much of the contract information has been summarized by WTD in previous presentations to Council, and that summary is not repeated in this Quarterly Report. Figure 1 shows the estimated cost of the various components of the BT-3C project, based on the terms of the contract and the schedule projection that forms the basis for contract milestones and incentives.

20 percent of the estimated cost is fixed, consisting of the fixed fee and the lump sum portion of equipment costs. The remaining 80 percent of the cost is reimbursable, for items such as tunnel lining segment production, TBM reconfiguration, and mining. The site office overhead is calculated as a percentage of other reimbursable items.



Notes: Total contract amount of \$68.9 million based on contract terms and schedule upon which incentives were developed. Compiled by OMC from data in BT-3C Cost Loaded Schedule Dated March 26, 2010

Figure 1: Summary of BT-3C Contract

Figure 1 does not include up to \$3.8 million in potential incentives described below, sales tax, or remaining West Tunnel construction activities to be completed by JDC. Incentives, if earned, will result in an increase in the contract amount via a change order.

Areas of OMC monitoring and follow-up related to the BT-3C contract are as follows:

Monthly reporting. As required per Council Motion 13188, Section C (6), WTD is providing monthly project reporting. The initial report was submitted on April 15, 2010 covering March 2010 activity. The May 14, 2010, report was limited to the lump sum payment for equipment in April 2010. The June 15, 2010 report was the first to include reimbursable items. OMC will continue to monitor these monthly reports.

Payment requests. OMC has not yet seen the agreed-upon payment request form that JDC will use when requesting payment for reimbursable costs. This payment request form is still under development and OMC expects to receive it when it is available. To aid in its review of payment requests, WTD has hired advisors who reviewed similar pay requests for a recent City of Portland tunneling project with a cost-reimbursable fixed fee contract format.

Construction progress monitoring. Currently, the TBM repairs are under way. Contract milestones and incentives are described in Table 9. Table 10 lists key construction events, the schedule date in JDC's cost loaded schedule dated March 26, 2010, and updated schedule information if available.

**Table 9: BT-3C Contract Milestones and Incentives**

Milestone or Key Event	Contract Milestone Date	Incentive
Contract Milestone 1: Start of Production Mining East of the Ballinger Way Portal	September 30, 2010	\$500,000 plus \$15,000 for each day of early completion.
Contract Milestone 2: Completion of BT-3 Mining.	342 days after Milestone 1. If Milestone 1 is reached on September 30, 2010, Milestone 2 would be reached on September 7, 2011.	\$1,000,000 plus \$20,000 for each day of early completion.
Substantial Completion (Target Completion)	434 days after Milestone 1. If Milestone 1 is reached on September 30, 2010, Target Completion Date would be reached on December 9, 2011.	\$500,000 plus \$15,000 for each day of early completion
Safety Incentive: Contractor Safety Incentive Program	Incentive is not schedule-based	Up to \$200,000, based on a Project Incidence Rate calculation specified in the contract
Safety Incentive: Employee Safety Incentive Program	Incentive is not schedule-based	Up to \$100,000, based on guidelines specified in the contract. Paid by WTD as a reimbursable cost.

Table 10: Key BT-3C Construction Events

Milestone or Key Event	Cost-Loaded JDC Schedule, March 2010	Updated Schedule, If Available	Notes
TBM hole out at Ballinger Way Portal	July 6, 2010	Late June 2010	1
Contract Milestone 1: Start of Production Mining East of The Ballinger Way Portal	September 30, 2010	No change from March 2010 JDC Schedule	
TBM Mining In Areas with Highest Hydrostatic Pressure	Not specifically stated	May 2011 – July 2011	2
TBM Mining Where Inspection Stops are Not Allowed	Not specifically stated	May 2011 – July 2011	3
Contract Milestone 2: Completion of BT-3 Mining.	September 6, 2011	No change from March 2010 JDC Schedule	
Substantial Completion	December 7, 2011	No change from March 2010 JDC Schedule	

Notes:

- (1) Updated schedule source: WTD. Screw conveyor modifications were initially planned to be completed before mining into the Ballinger Way Portal, so that they could be tested during the remaining 150 LF of BT-4 mining. Because of the conveyor fabrication schedule, the modifications will be made at the portal to better align with the overall BT-3C schedule.
- (2) Updated schedule source: OMC estimate based on contract documents and JDC's March 2010 cost-loaded schedule. Per the contract documents, inspection stops are not allowed between Stations 795+00 and 805+00.
- (3) Updated schedule source: OMC estimate based on contract documents and JDC's March 2010 cost-loaded schedule. Based on hydrostatic pressure documentation in the Geotechnical Baseline Report, the areas of highest hydrostatic head are expected between Stations 790+00 and 808+00. It is assumed by OMC that this corresponds to the areas of highest TBM face pressure and the areas where the TBM face pressure is most likely to exceed 7 bar.

At this point, OMC has no evidence that BT-3C progress is deviating from milestones dates and have not changed from the baseline schedule.

Staffing plan. WTD has provided an organizational chart for the construction management of the BT-3C project. WTD reports that the WTD Director and the Brightwater Project Manager ensure that adequate resources are available to manage the project. Specifically WTD Management matches the body of work to the number of positions and expertise required to complete it. Specific consultant expertise supplements existing staff to ensure qualified individuals are meeting project needs. Additionally, hours worked by staff are continually monitored to ensure workloads and overtime hours are controlled.

OMC continues to question whether existing staff have sufficient availability to manage this contract and retain other project responsibilities, and still believes WTD should make additional strategic investments to address cost and schedule risks.

Independent Audits of Pay Requests. WTD is hiring an independent consultant to audit JDC's payment requests and WTD's payments to JDC. WTD is currently awaiting responses to its RFP for this consultant. OMC applauds WTD for this action and encourages proactive use of this function, to identify issues early and correct billing practices (if required) for the remainder of the contract.

Decision Making Protocols. OMC has reviewed WTD management of the BT-3C contract via meetings with WTD and documents received from WTD. WTD has procedures in place to require Division Director approval of all items that would result

in a cost increase above the contracted amount, or changes to contract milestones. There are a number of formal and informal methods of communication of project issues from WTD's Project Manager to the Brightwater Program Manager and the Division Director.

### Disputed Costs

Disputed costs are those related to the slower than planned BT-2 and BT-3 mining progress where ultimate payment responsibility has not yet been determined. The disputed costs we have identified are only those for which documentation has been provided by contractor requests. If there are other potential costs yet to be requested, we have not seen nor included those in this discussion. OMC's review of the 2010 Trend Report describes these costs in more detail.

OMC's current estimate of known disputed costs is \$178.1 million, which includes: the sum of certain existing requested change orders and claims on BT-2 and BT-3, WTD's estimate of the cost to complete the BT-3 mining, and contingencies related to completion of the remaining BT-3 work estimated by OMC. The estimate does not include an anticipated change order with VPFK for work resulting from the BT-3C contract, including construction of the connection point between the two BT-3 TBMs and removal of VPFK's TBM, and it does not include up to \$3.8 million in BT-3C incentives payments. OMC's estimate of known disputed costs also does not include: (a) a reasonable construction contingency based on construction risks and the cost-reimbursable fixed-fee contract type, (b) a project contingency based on construction risks for any additional non-construction costs such as engineering and construction management, or (c) other future construction costs such as the cost of removing VPFK's TBM from within the tunnel or the cost of the connection between the tunnel segments mined by JDC and VPFK. For these reasons, OMC believes that the amount of disputed costs could increase to over \$200 million.

OMC is not assessing the County's potential for success on the disputed issues as that opinion would require an assessment of legal issues. The County is represented by the Prosecutor's Office and its outside counsel, Stoel Rives, on the contract administration items that have become legal matters.

There is likely to be uncertainty over these costs for some time. Certainty will only come after completion of BT-3 mining (anticipated by WTD to occur in late 2011) and resolution of disputes related to BT-2 and BT-3 mining. The County has initiated a lawsuit against VPFK and its surety Travelers concerning the costs of the BT-3C contract and related impact costs and a trial date is currently set for October 2011.

### Budget Proviso Follow-up

Since January 2010, OMC has worked collaboratively with WTD in its assessment of startup alternatives given (1) substantial completion of the treatment plant, IPS, and remaining conveyance system are all anticipated at different dates, and (2) WTD's current plan is to start up the treatment plant and discharge into the existing collection system until the Brightwater conveyance system is completed. OMC helped WTD frame the technical analysis, reviewed results, and provided input to the budget

proviso report<sup>5</sup> preparation. The Proviso report was accepted by King County Council motion 2010-0275 at its June 28, 2010 meeting.

The budget proviso report contains month-by-month projections of related capital and operating expenses associated with four startup scenarios. The four scenarios describe options for the date of treatment plant testing and startup, and each scenario also is analyzed according to early completion, baseline schedule, and late completion schedule assumptions.

OMC feels the budget proviso report is best understood as a series of future decision points. Key decisions include whether to use existing contractors for startup services and whether to put the plant in standby mode during the interval between startup and initiation of wastewater discharge through the Brightwater conveyance system. OMC feels it is appropriate to use existing contractors for startup services to best preserve equipment warranties and to retain leverage over the existing contractors who built the treatment plant. OMC does not have yet have an opinion on whether to put the plant in standby mode – this decision depends on the conveyance construction schedule.

These decision points are not imminent – the first is expected to be in October 2010. At that time, WTD needs to begin negotiating a change order with existing treatment plant contractors to address the interval between treatment plant substantial completion and the initiation of clean water testing. Currently, this interval is expected to be 2.5 months. OMC recommends that when WTD negotiates these change orders, that it consider the effects of commissioning schedule uncertainty in its negotiation strategies.

### M&E Tax Exemption Status

As described in previous OMC Trend Report reviews, WTD is seeking an M&E sales tax exemption related to the production of reclaimed water and biosolids. In its 2009 and 2010 Trend Reports, WTD is assuming the total potential tax exemption to be approximately \$41 million. The uncertainty over the availability of all or a portion of this tax exemption is part of the range in the revised OMC cost estimate. Resolution of this issue is not expected until mid-2011 at the earliest. By the time this issue is resolved, WTD will have already paid the sales tax, and would seek recovery of its costs.

## Cost

### Revised OMC Estimate

In April 2010, WTD published its 2010 Trend Report. OMC published its 2010 Trend Report Review on June 8, 2010 which contains a revised OMC estimate of Brightwater Project Cost. Table 11 summarizes the revised OMC cost estimate.

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<sup>5</sup>Commissioning Alternatives – Brightwater Wastewater Treatment Plant, March 2010

Table 11: Estimated Project Costs (nominal \$million)

Project Component	WTD Baseline Budget	WTD 2009	WTD 2010	OMC 2009	OMC 2010
	3% Infl. - 5% Infl	Trend Report	Trend Report	Estimate	Estimate
Conveyance	\$1,020.6 - \$1,105.5	\$921.2 - \$952.9	\$931.6 - \$963.3	\$929.2 - \$966.9	\$919.3 - \$951.1
Treatment Plant	\$639.6 - \$684.4	\$878.6 - \$887.9	\$884.2 - \$893.5	\$892.2 - \$907.5	\$895.2 - \$904.5
Subtotal	\$1,660.2 - \$1,789.9	\$1,799.8 - \$1,840.8	\$1,815.8 - \$1,856.8	\$1,821.4 - \$1,874.4	\$1,814.6 - \$1,855.6

↑  
 This OMC 2010 Estimate Includes  
 Non-Disputed Costs Only

Because the OMC 2010 Estimate does not include disputed costs, comparisons with the WTD 2010 Trend Report estimate and the 2009 OMC Estimate are difficult. Factors that will decrease the project cost are listed below and discussed in more detail in the main body of the report. The converse of these factors will alternately increase the project costs.

- Greater success in recovering and/or not being required to pay potentially disputed costs
- Ability to secure the full amount of the M&E sales tax exemption
- Successful completion of the remaining BT-3 mining at a cost less than estimated by WTD
- Ability to manage other project issues resulting in lower costs than estimated including: resolution of other existing change orders and claims; avoiding delays on other project contracts that influence cost, successful start up and commissioning of the treatment plant; and ramp down of project staff and consultant work as construction contracts are closed out.

New OMC recommendations listed later in this report are based in part on these factors.

**Buyout Savings Update**

Subcontractor buyout complete for all liquids contract activities for which a maximum allowable construction cost (“MACC”) has been negotiated. WTD is currently negotiating one additional agreement with Hoffman for Environmental Education and Community Center (“EECC”) tenant improvements that will increase the MACC. Execution of this agreement, expected to cost less than \$1.2 million, will trigger the final round of subcontractor buyout. EECC tenant improvements are considered part of WTD’s mitigation budget.

As of May 31, 2010, the remaining buyout savings were approximately \$5.9 million. Of this amount, approximately \$3.8 million is associated with the EECC and the site Landscaping buyout that occurred between January and July 2009. The EECC tenant improvements will be funded from buyout savings.

### Change Order Status

The most recent claim and change order data is from WTD’s May 31, 2010, construction reports, and is as follows:

- Conveyance construction is approximately 75 percent complete, measured as percent of contract value earned by construction contractors. This value includes the BT-3C contract and excludes Central Tunnel Conditional Change Orders. Executed Conveyance change orders are approximately 53 percent of WTD’s conveyance construction contingency. Including pending (costs negotiated but not executed) and current projections of known potential (costs not yet negotiated) change orders could increase this to a maximum of about 182 percent. A large portion of these known potential change orders are claims denied by WTD and are disputed.
- Treatment Plant construction progress is approximately 82 percent complete, while executed Treatment Plant change orders are approximately 31 percent of WTD’s construction contingency. Including pending and estimates of potential change orders could increase this up to a maximum of about 39 percent. In our review of WTD’s 2010 Trend Report, OMC concluded that the remaining construction contingency is anticipated to cover non-disputed costs through the remainder of the contract.

Table 12 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 12 excludes the Central Tunnel Conditional change order because ultimate payment responsibility has not yet been determined. The BT-3C contract is excluded from Table 12 because change orders to increase cost are less relevant to a cost-reimbursable fixed-fee contract.

**Table 12: Construction Progress and Change Order Summary by Contract**

Major Construction Contract	Amount Paid to Contractor \$M, (1,2)	Percent Construction Complete (1,2)	Executed Change Orders (2, 3)		Executed, Pending, And Requested Change Orders (2, 3)	
			\$M	% of Paid	\$M	% of Paid
Marine Outfall	\$29.6	99%	\$2.2	7%	\$2.2	7%
West Tunnel (JCT)	\$100.0	95%	\$13.7	14%	\$13.8	14%
Central Tunnel	\$177.8	81%	\$9.7	5%	\$97.7	55%
East Tunnel	\$133.6	98%	\$5.2	4%	\$11.9	9%
IPS	\$40.7	40%	\$10.1	25%	\$15.9	39%
Liquids Stream	\$249.8	82%	\$5.5	2%	\$6.4	3%
Solids Stream	\$139.6	83%	\$2.5	2%	\$3.5	3%

(1) Measured by Milestone-Based Payments to Contractors. Amount paid divided by sum of original contract value plus executed change orders. Central Tunnel paid to date includes amounts paid under Conditional Change Orders 13, 15 and 18, and the ultimate payment responsibility has yet to be determined.

(2) As of May 31, 2010.

(3) Excludes Central Tunnel \$20M conditional change orders. \$3.25M of Central CO19 included as Pending (incentives not yet earned).

Table 12 indicates that executed change orders, as a percent of the amount paid to contractors, are generally within industry norms, with three exceptions:

- West Tunnel, where a \$4.8 million change order was executed to cover certain activities related BT-3 completion where WTD wanted the work to commence prior to negotiation of the BT-3C contract. This change order is considered a disputed cost.
- Central Tunnel, where the majority of the pending and requested change orders are disputed.
- IPS, where the majority of the executed, pending, and requested change orders are either
  1. Disputed costs related to slow progress on BT-2 mining, including the \$5.7 million change order for the Influent Structure redesign
  2. Related to impacts from the East Tunnel contract which contained a substantial amount of work in building the North Creek Portal at the IPS site.

### Contingency Analysis

Of WTD's \$55 million conveyance construction contingency shown in the 2010 Trend Report, approximately \$36.5 million remains as of May 31, 2010. Several large change orders have been executed since 12/31/09, including a West Tunnel change order related to the TBM factory testing, BT-3C activities completed by JCT, BT-2 construction, and the Influent Structure redesign. OMC has estimated that the conveyance construction contingency should be adequate to cover potential future changes on non-disputed portions of the conveyance system, given industry-standard assumptions on the amount of future change orders as a percentage of remaining contract work to be completed. At best, OMC estimates that WTD may not use or otherwise leave available up to \$20 million for other purposes.

Of WTD's \$19 million treatment plant construction contingency shown in the 2010 Trend Report, approximately \$17.4 million remains as of May 31, 2010.

In its 2010 Trend Report, WTD no longer carries a project contingency. OMC assumes that any increase in non-construction costs compared with WTD's 2010 Trend Report estimates would be funded from other sources.

### Schedule

#### Treatment Plant Remains on Schedule

The schedule for hydraulic completion of the Treatment Plant has not changed substantially within the last six months. As of March 31, 2010 substantial completion is projected to be February 21, 2011 and March 1, 2011 for the liquids and solids contracts, respectively. The liquids date is unchanged from the previous quarter and the solids date is six days later.



### **BT-2 Tunneling is Now Progressing Well**

In May 2010, the BT-2 mining cleared two major remaining risk areas: the I-405 crossing and the North Creek crossing. BT-2 mining was completed on June 22, 2010, ahead of the schedule anticipated at the resumption of mining in February 2010. Since resumption of mining, weekly production has averaged 202 feet/week, compared with 107 feet/week prior to the 2009 TBM repairs. VPFK has already earned \$2.0 million in incentive payments and is on schedule to earn the remaining \$3.0 million.

### **BT-3 Completion Schedule Remains on the Critical Path for Discharge to Outfall**

BT-3C contract milestones and key construction dates are summarized above. Completion of the BT-3C contract is on the critical path for discharge to the Marine Outfall. After the BT-3C contract is complete, the critical path shifts to BT-3 tunnel lining and completion of the North Kenmore Odor Control Facility.

### **Treatment Plant Start-up Critical Path is within the IPS Contract**

Currently, the solids and liquids contracts are anticipated to reach substantial completion in late February or early March 2011. At this time, they would be ready for the treatment plant clean water test. To complete the treatment plant clean water test, the IPS must also be ready for clean water testing, which is currently anticipated to occur on May 13, 2011. Initiation of wastewater treatment is currently anticipated to occur in August 2011 and would occur after completion of clean water testing.

## **Major Risk Issues**

Looking forward, the major conveyance cost and schedule risk issues include BT-3 mining progress, resolution of disputed costs, and resolution of the M&E sales tax exemption.

WTD developed a risk register for the BT-3C project in February 2010 and updated it in June 2010. OMC has reviewed WTD's BT-3C risk register and has requested information regarding mitigation plans for specific risk items. OMC will be reviewing the specific mitigation plans and the thresholds WTD has established for implementation of mitigation measures.

Major BT-3C risks are outlined below. WTD has expressed the greatest concern over the first two bulleted items:

- Unplanned non-productive time, which would occur when a rail car is not available at the BT-3C TBM to haul mining spoils out of the tunnel. Because the increased length of the tunnel increases the likelihood of unplanned non-productive time, WTD and the contractor have planned for a reduction in the mining rate compared with the observed BT-4 mining rate due to this issue.
- Boulders. As with all other Brightwater tunnels, WTD is concerned about boulders. A temporary mining stoppage to be able to remove a boulder is always of concern to WTD but is of more concern in the areas of highest pressure and in BT-3C's 1,000 foot no inspection stop zone.

- Also on WTD's risk register is the risk of overexcavation. The risk of overexcavation increases when using the BT-4 earth pressure balance machine in high pressure conditions.
- Performance of the TBM. OMC believes it is important that WTD has conducted quality assurance/quality control review of Lovat's BT-3C TBM modification designs, by staff and/or consultants with TBM design experience.

OMC has asked WTD for more clarification regarding how WTD will assess if the BT-3C contract is unable to complete the BT-3C mining and when WTD will assess other alternatives. Related to this question is determination by WTD on when to allow VPFK to dismantle the existing BT-3 TBM and dismantle the slurry separation plant at the North Kenmore Portal. WTD has not yet made a final decision on these items.

Resolution of disputed costs and the disputed M&E exemption from sales tax are described earlier in this report.

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 has been mitigated well to date, and has not resulted in schedule slippage or increased cost to WTD.
- Instrumentation, component testing, and systems testing issues that are common to treatment plants. OMC has no evidence of specific issues that are currently causing schedule delays at this time.

### Progress on Previous OMC Recommendations

OMC acknowledges WTD's efforts to improve responsiveness to OMC data requests and questions. Areas of progress and continued areas of OMC concern are described in Table 13.

Table 13: Progress on Previous OMC Recommendations

OMC Recommendations <sup>6</sup>	WTD Follow-up	Additional OMC Follow-up
<i>From Previous OMC Quarterly Reports</i>		
<p>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. [5/15/09 Report on Quarter ending March 31, 2009]</p> <p>In its communication to the County Council and the OMC, WTD should more comprehensively and quantitatively assess the level of contingencies. This assessment should be more rigorous than what has been previously provided. [1/26/10 Report on Quarter ending September 30, 2009]</p>	<ul style="list-style-type: none"> <li>• OMC and WTD met in August 2009 to discuss specific items related to this recommendation. WTD has compiled and provided documentation for many of the items discussed in August 2009. The information provided by WTD helped OMC formulate its recommendations in the quarterly report published on September 17, 2009. Earlier in 2009, WTD began providing weekly treatment plant and conveyance risk register updates to the OMC in response to the earlier recommendations.</li> <li>• WTD has developed a risk register for the BT-3C contract.</li> </ul> <ul style="list-style-type: none"> <li>▪ Feedback on this recommendation to be provided via Auditors office or other attendees of discussions between WTD and council.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Actions have provided improved access for OMC to assess WTD's resource use and risk assessments. On-going monitoring of new risk reporting efforts completed by risk, including project-specific risk registers. OMC will monitor future risk assessments and requests advance knowledge of issue-specific risk assessments currently under development by WTD.</li> <li>▪ OMC continues to believe that WTD's risk assessments should be more comprehensive, more quantitative, and completed earlier; although, OMC also recognizes that WTD's risk assessments are ongoing efforts that are not easily packaged for the purposes of oversight review.</li> <li>▪ OMC is continuing to evaluate WTD's contingency plans for risks identified in the BT-3C risk register.</li> </ul> <ul style="list-style-type: none"> <li>▪ Continue to monitor.</li> </ul>

<sup>6</sup> Certain recommendations from previous OMC Quarterly Reports have been deleted from this table if the recommendation has been fully implemented, if the issue fully addressed, or if the recommendation closely matches a recommendation in a subsequent OMC Quarterly Report.

**OVERSIGHT MONITORING CONSULTANT REPORT**

OMC Recommendations <sup>6</sup>	WTD Follow-up	Additional OMC Follow-up
<i>From OMC Presentation to Government Accountability and Oversight Committee, April 2010</i>		
<ul style="list-style-type: none"> <li>▪ Written staffing plan to be provided by WTD, including backfill of any resources that are currently covering any other Brightwater project duties.</li>   <li>▪ Documentation of the extent of on-site assistance provided by the TBM manufacturer and the manufacturer's certification for the range of pressures to be encountered.</li>   <li>▪ Timely updates to BT-3C risk register including refined assessment and measurement of the key risk elements.</li>   <li>▪ Any changes in WTD's decision-making protocols needed to manage the BT-3C contract.</li> </ul>	<ul style="list-style-type: none"> <li>▪ WTD has provided an org chart for managing this contract and has explained additional staffing and management details.</li>   <li>▪ Additional documentation regarding contingency actions to be provided.</li>   <li>▪ Has provided some additional documentation regarding key BT-3C risks.</li>   <li>▪ WTD has provided signature authority protocols and has provided additional clarification.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ongoing monitoring and reporting.</li> <li>▪ Continue to monitor. OMC continues to question whether existing staff have sufficient availability to manage this contract given other project responsibilities, and still believes WTD should make additional strategic investments to address cost and schedule risks.</li>   <li>▪ On-site TBM assistance clarified. Issue closed.</li>   <li>▪ OMC has requested and awaits WTD's assessments of key risk elements. Risk register updates and specific contingency analyses have been requested</li> <li>▪ Issue closed.</li> </ul>

## Conclusions and New OMC Recommendations

### Many Project Components Continue To Go Well

The treatment plant and startup schedules have not significantly changed in the past year. The IPS schedule has not changed since it was revised after incorporating the redesigned Influent Structure.

Construction on the liquids and solids phases has remained on schedule for August 2011 startup of the treatment plant with discharge to the existing King County conveyance system and subsequent treatment at the West Point and/or South wastewater treatment plants.

Anticipated treatment plant end-of-job change orders continue to be within reasonable industry levels.

East Tunnel construction is nearing substantial completion. West Tunnel mining has gone well and mining production was faster than anticipated. BT-2 mining was completed on June 22, 2010, ahead of the schedule anticipated at the resumption of mining in February 2010.

### New Recommendations

New OMC recommendations are shown below and are based on the factors described earlier in this report that could decrease the project cost.

1. WTD should ensure that proper and complete quality assurance/quality control efforts are documented as part of the project's review of Lovat's BT-3C TBM modification designs by staff and/or consultants with TBM design expertise.
2. WTD should continue to assess JDC's progress refurbishing the TBM and mining progress (once it resumes) and proactively develop contingency plans. Contingency plans should include thresholds for taking action WTD should also ensure that its ongoing BT-3C completion planning include timing of remaining VPFK work, and define the responsibility for connection between the tunneling segments completed by VPFK and JDC.
3. If change orders related to the interval between treatment plant substantial completion and commissioning are required, WTD should consider the effects of commissioning schedule uncertainty in its negotiation strategies.
4. WTD should dedicate sufficient resources to pursue all ways to manage other project issues that could reduce costs compared with estimates, including: resolution of other outstanding change orders and claims; avoiding delays on other contracts that influence cost, successful start up and commissioning of the treatment plant; an assessment of whether any cost recovery opportunities are available; completing mitigation project commitments; ramp down of project staff and consultant work as construction contracts are closed out; and securing the M&E sales tax exemption.