

**King County**

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MEMORANDUM

DATE: February 20, 2008

TO: King County Council Capital Budget Committee

FROM: Cheryle A. Broom, ^{CB} County Auditor

SUBJECT: Brightwater Project Quarterly Oversight Report

Attached is the third R.W. Beck's Brightwater Project Oversight Report (Beck report) issued under the mandated Capital Project Oversight Program. The first Beck oversight report, presented to the Council on May 16th, analyzed the Wastewater Treatment Division's Brightwater Project 2007 Trend Report, and the project status at the conclusion of the design phase. Beck's September 2007 Brightwater Project report to the Capital Budget Committee was the first report to be presented to the Council in an expanded format that provides more comprehensive information about the status of the Brightwater Project budget and schedule, and establishes a framework for easier monitoring of future project performance.

Beck's current oversight report concludes that the Wastewater Treatment Division (WTD) has continued to make significant progress in implementing all but one of the May 16th oversight report recommendations: development of the integrated Brightwater Project schedule. The integrated project schedule, expected to be complete in March 2008, has become increasingly important due to 61-day slippage on the East Tunnel contract; the potential impact of the East Tunnel delay on the Central Tunnel and Influent Pump Station construction contracts; and consumption of the available schedule "float" on the Treatment Plant GC/CM contract.

WTD has also awarded all the major construction contracts for the Brightwater Project, after receiving a very favorable bid—\$27 million below the Engineer's Estimate—for the Treatment Plant solids/odor control facilities. Nevertheless, the combined construction contract values for the overall Brightwater Project have led to a total project cost estimate that continues to trend upward. The total project cost estimate is now expected to be \$75 to \$95 million higher than WTD's 2007 Trend Report estimate of \$1.76 billion. The current cost estimates are also more consistent with the higher end of Beck's \$1.84 to \$1.86 billion cost estimate developed in May 2007.

In addition to completion of the master integrated schedule, the Beck report identifies four new oversight recommendations. These recommendations focus on closer tracking of project progress and delays, determining the impact of delays on project schedules and costs, and collaborative partnering to develop creative solutions to coordination and scheduling issues. The Brightwater Project oversight work group will continue to monitor WTD's implementation of the recommendations on behalf of the Council.

Again, we appreciate the collaborative efforts of WTD, council staff, and R.W. Beck consultants in promoting effective oversight of the Brightwater Project consistent with council intent. Please contact me or Susan Baugh, who is coordinating this endeavor for the auditor's office, if you have any questions or comments.

CB:SB:yr

Attachment: R.W. Beck Oversight Consultant Quarterly Report, December 2007

cc: Metropolitan King County Councilmembers
Ron Sims, County Executive
Theresa Jennings, Director, Department of Natural Resources and Parks (DNRP)
Christie True, Division Director, Wastewater Treatment Division, DNRP
Bob Cowan, Budget Director, Office of Management & Budget (OMB)
Dave Lawson, Internal Audit Supervisor, Executive Audit Services, OMB
David Jochim, Vice President, R.W. Beck, Inc.
Pat Tangora, Senior Director, R.W. Beck, Inc.
Saroja Reddy, King County Council Policy Staff Director
Mark Melroy, Senior Principal Legislative Analyst, King County Council
Capital Budget Committee
Beth Mountsier, Senior Principal Legislative Analyst, King County Council
Regional Water Quality Committee

Brightwater Project Construction Phase
Oversight Management Consultant Report
(For Period Ending December 31, 2007)

King County
Brightwater Project Oversight Services
Contract No. P43024



In association with



Brightwater Project Construction Phase
Oversight Management Consultant Report
(For Period Ending December 31, 2007)

King County
Brightwater Project Oversight Services
Contract No. P43024



In association with



INTERNATIONAL



Brightwater Project Construction Phase Oversight Management Consultant Report

For Period Ending December 31, 2007

Final as of February 15, 2008

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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 Management Consultant Report

For Period Ending December 31, 2007

Final as of February 15, 2008

This report is a briefing on the Brightwater Project provided by R. W. Beck, Inc., the project's Oversight Monitoring Consultant (OMC). The OMC's last report was dated September 19, 2007 and covered the period through July 31, 2007.

Executive Summary

- **Treatment Plant Costs.** WTD has awarded the Treatment Plant Solids/Odor Control Facilities contract to Kiewit Pacific Company (Kiewit), for \$166,459,000. This contract value is about \$27 million below the Engineer's Estimate. Notice to Proceed was issued on January 3, 2008.
 - While Kiewit's bid was substantially below the Engineer's Estimate, that estimate included a \$10 million adjustment for "market conditions", and likely reflected efficiencies and mobilization savings that could be realized by Kiewit because they are also the prime contractor for the Influent Pump Station (IPS).
 - The Solids/Odor Control Facilities was the last large contract remaining to be bid. The OMC currently projects that Treatment Plant costs will be \$64 to \$84 million higher than WTD's 2007 Trend Report estimate of \$840 million.
- **Conveyance System Costs.** All major contracts have been awarded. The OMC's current estimate of Conveyance System costs is about \$10 million higher than WTD's 2007 Trend Report estimate of \$928 million.
- **Schedule Progress.** The OMC has identified schedule risk issues for both the Treatment Plant and Conveyance.
 - The East Tunnel contractor projects a 61-day delay in meeting Milestone 1, which could delay the start of IPS construction work, conflict with the Central Tunnel contractor, and perhaps delay hydraulic completion. WTD notes that the contractor's schedule did not re-sequence work to make up lost time or reflect actual "production mining" rates, which are yet to be established. Nonetheless, in our opinion, it is unlikely that the contractual date for Milestone 1 will be met, although the length of delay is uncertain.
 - For the Treatment Plant, Hoffman reports that all "float" has been used up due to delays laying rebar and placing concrete. This has not delayed the completion date, and there may be opportunities to increase float. Nonetheless, it raises the risk of the overall project critical path potentially shifting from Conveyance to the Treatment Plant at some point in the future.

- This underscores the importance of completing the Master Integrated Schedule, which is currently awaiting accepted contractor baseline schedules for the IPS (expected in February 2008) and Solids contract (expected in March 2008).
- Additional measures to manage the risk of delay are recommended by the OMC as detailed below.
- **Other Risks.** Looking forward, major risk issues include: tunneling, coordination and integration of work under two different prime contractors at the Treatment Plant, and schedule.

Progress on Previous OMC Recommendations

WTD has completed implementation of all but one of the recommendations we made in May 2007¹. One area requires continued and additional attention: efforts to complete the Master Integrated Schedule.

Status of Costs

Cost trend information is summarized in Table ES-1. The final column updates our “estimate at completion” to account for new information, such as the contract value for the Solids/Odor Control Facilities. Based on this information, we believe the final Project cost is trending toward the upper end of the \$1.827 to \$1.862 billion range we provided in May 2007. The lower end of our January 2008 estimate is approximately \$15 million higher than the lower end of our May 2007 estimate. Additional information on Conveyance and the Treatment Plant is provided below.

Table ES-1. Estimated Project Costs (nominal \$M)

	WTD 2004 Baseline 3% Infl. 5% Infl.	WTD 2005 Trend	WTD 2007 Trend	OMC Estimate Based on Review of 2007 Trend (2)	OMC 1/08 Estimate at Completion (2)
Conveyance	\$1,021 - \$1,106	\$ 960	\$ 928	\$ 946 - \$ 952	\$938
Treatment Plant	\$ 640 - \$ 684	\$ 793	\$ 840	\$ 882 - \$ 911	\$904 - \$924
Total (1)	\$1,660 - \$1,790	\$1,753	\$1,767	\$1,827 - \$1,862	\$1,842 - \$1,862

Note:

1. All costs are shown in millions of nominal dollars.
2. This estimate includes actual contract values for portions of the project contracted in 2007.

Conveyance

All major Conveyance System cost elements have been bid and construction is underway. There are two remaining ancillary items in design; however they amount to about 1 percent of the total Conveyance construction cost.

¹ These include: aggressive outreach to the construction contracting community prior to the Solids Package bidding process, developing a contingency plan to address the potential for an unfavorable Solids Package bid, obtaining Hoffman’s review of the Liquids Package and Solids Package scopes, restating the 2004 Baseline Budget, and developing draft standards for delegations of signature authority.

Treatment Plant

Kiewit submitted the low bid of \$167,869,000. WTD opted to exclude two optional bid alternates and has awarded a \$166,459,000 contract to Kiewit. The Engineer's Estimate was \$193,156,599. In the OMC's opinion, Kiewit's bid appears reasonable considering that the Engineer's Estimate included an adjustment of almost \$10 million for "market conditions", and because of potential efficiencies and mobilization savings associated with Kiewit also acting as the prime contractor for the Influent Pump Station.

Schedule

The most recent Master Integrated Schedule available for our review (through November 2007) incorporated contractor-provided information except for the IPS, Marine Outfall, and Solids contractors. (Since then, schedule information has been provided by the Marine Outfall contractor; schedules are expected from the IPS and Solids contractors in February and March 2008, respectively.)

In addition, the November Master Integrated Schedule did not reflect a recent schedule update from the East Tunnel contractor since that contractor had a change order request pending with WTD for adding 70 days to Milestone 1 due to a force majeure delay in delivery associated with manufacturing of bearings for the tunnel boring machine. The East Tunnel contractor has provided a schedule update dated December 31, 2007, which WTD indicates will be incorporated in the December Master Integrated Schedule, but which was not yet available for our review. Nonetheless, the contractor's schedule currently reflects a 61-day slippage in meeting the revised Milestone 1 date – the date established for turning over the North Creek portal to the IPS contractor. WTD has indicated that the December schedule from the East Tunnel contractor did not attempt to re-sequence work to make up for lost time.

In addition, a more precise estimate of degree of impact to the IPS contractor will depend on final production mining rates achieved by the East Tunnel contractor, which has just started production mining. Nonetheless, in our opinion, it is unlikely that the contractual date for Milestone 1 will be met, although the degree of delay is uncertain. This is because of the linear nature of the work; the contractor's schedule already calls for two, ten-hour mining shifts per day; and even with increased production mining rates, it is unlikely that the contractor will be able to make up all of the time. Potential impacts from delaying Milestone 1 include delay in starting IPS construction work, conflicts with the Central Tunnel contractor who is scheduled to retrieve the BT-2 TBM in the North Creek portal in about that time frame, and, possibly delay of hydraulic completion. A more conclusive estimate of potential delays is expected by the end of March 2008.

In addition, Hoffman has experienced delays related to laying rebar and pouring concrete slabs at the Treatment Plant, which has used up available float. This has not delayed the Milestone completion date for the Treatment Plant and there may be opportunities to increase the float as the project progresses. Nonetheless, it raises the risk of the critical path shifting from Conveyance to Treatment at some point in the future.

New OMC Recommendations

In addition to completing the Master Integrated Schedule, we recommend that WTD take the following steps to better understand the impacts and manage the risks of delay:

- WTD should engage and facilitate the Central Tunnel, East Tunnel, and IPS contractors in partnering sessions to develop creative solutions to the East Tunnel schedule delay, such as ways to allow multiple contractors to be working simultaneously at the North Creek portal site.
- On a parallel track, WTD should evaluate the overall costs and risks of a Conveyance System and/or overall project delay in terms of construction contract costs (i.e. liquidated damages), WTD staffing and consultant costs, and other risk costs.
- WTD should identify the “drop dead” dates for making key decisions that affect the overall Project schedule (such as the decision to install recirculation piping at the Treatment Plant); and
- WTD should closely monitor progress on the East Tunnel and Treatment Plant over the next two to three months, and develop an overall project schedule mitigation plan if warranted.

It should be noted that WTD’s risk register identifies risks to schedule and WTD’s risk mitigation plans address some of the above recommendations.

Background

We last reported to the Capital Budget Committee (CBC) on September 19, 2007. Since then, work has progressed on the West, Central and East Tunnels, and geotechnical investigations and related early activities have started at the Marine Outfall. At the Treatment Plant, major earthwork has been underway, and initial concrete pours for several of the Liquids Package facilities have been completed.

Bids for the Solids/Odor Control Facilities, the final remaining major construction contract for the Brightwater Project, were opened in late October, 2007, a recommendation for award to Kiewit Pacific Company was made in late November, and the contract was awarded in December 2007 with Notice to Proceed on January 3, 2008. A summary of the status of construction contracts for the Brightwater Project is shown in Table 1. Note that many of the contracts include escalation clauses that would be implemented via Change Order which would change the Contract Amounts.

Table 1
Status of Construction Contracts for the Brightwater Project

Element	Status	Contract Award Amount ⁽¹⁾	Escalation Clauses ⁽²⁾
Conveyance			
East Tunnel	Under contract NTP: Jan. 30, 2006	\$130.9M	Capped at \$1,000,000. Steel pipe, rebar, and some concrete.
Central Tunnel	Under contract NTP: Aug. 28, 2006	\$211.1M	Capped at \$300,000. Steel pipe, rebar, and some concrete.
West Tunnel	Under contract NTP: Feb. 20, 2007	\$102.0M	Capped at \$1,000,000. Steel pipe, rebar, and some concrete.
Influent Pump Station	Under contract NTP: July 26, 2007	\$92.1M	Capped at \$300,000 for certain materials. Also allows additional increases for certain equipment if documented.
Marine Outfall	Notice of award provided late August 2007	\$27.6M	In RFP, capped at \$500,000 for environmental and safety incentives; \$1,000,000 cap for certain materials.
Ancillary Facilities ⁽³⁾	Mostly under contract	\$11.3 M	
Treatment Plant			
North Mitigation Area and EECC	Under contract NTP: March 1, 2006	\$7.7M ⁽⁴⁾	No escalation clauses. WORK COMPLETED
Site Preparation	Under contract NTP: March 30, 2006	\$23.8M ⁽⁴⁾	No escalation clauses. WORK COMPLETED
Earthwork	Under contract NTP: April 5, 2007	\$41.8M ⁽⁴⁾	Capped at \$250,000. Only for diesel.
Liquids Package	Under contract NTP: April 6, 2007	\$245.4M ⁽⁴⁾	Capped at \$3,000,000
Solids Package	Bid opening Oct. 25, 2007 NTP: January 2008	\$166.5M	

Notes:

1. Contract Award Amount excludes subsequent change orders. Includes approximately \$6.1 million non-Brightwater reclaimed water projects (in the Central Tunnel, West Tunnel, IPS, and Ancillary Facilities contracts) and \$0.7 million in non-Brightwater asset management costs in the Ancillary Facilities contracts.
2. Change orders related to escalation are generally triggered by the percentage change in certain cost indices published by Engineering News Record, less five percent, or other industry cost indices. Specific requirements vary among the various contracts.
3. North Creek Facilities and Hollywood Facilities. Cost does not include Kenmore and Ballinger Odor Control facilities, which are not yet under contract for construction.
4. Cost shown is the GCC. There is potential cost savings from subcontractor buyout savings and unused MACC Contingency

Conveyance

- The design-build contractor at the Marine Outfall delivered a 60 percent design submittal on December 20, 2007. The contractor has been performing geotechnical investigations at the site and has identified several additional areas of contaminated soil as well as unmapped timber and concrete debris. WTD has authorized additional work to better identify the extent of these areas, and is working with the contractor to develop contingency plans.

- The West Tunnel construction is proceeding without major issues. WTD has increased its outreach efforts to address community concerns related to the increase in construction activity. One other West Tunnel non-construction issue is being monitored as WTD continues to negotiate costs with owners of the Paramount Property. It is also preparing to trigger a mediation process if necessary (WTD has use and possession of the site so this is not expected to affect the Project schedule).
- The Central Tunnel construction is proceeding with no major issues to report. The Central Tunnel contractor could, however, be affected by delays in the East Tunnel work. (This delay would not affect the critical path for the Central Tunnel.) Two non-construction issues are being monitored: 1) King County is moving forward with condemnation proceedings to acquire an easement under a parcel of property owned by the City of Seattle; and 2) WTD is in negotiations with Lake Forest Park Water District regarding the District's concerns that Central Tunnel construction may impact its aquifer.
- As reported in September, startup of tunneling by the East Tunnel contractor was delayed because of delays in manufacturing of the TBM, due to a delay in fabrication of the main TBM bearing. The East Tunnel contractor submitted a request for change order due to a force majeure delay, because the fabrication of the bearing was delayed by military orders that took precedence over non-military manufacturing. WTD granted this 70-day delay extension to Milestone 1.
 - In addition, East Tunnel production rates have not achieved planned levels due to problems with the TBM mechanical, electrical and computer systems. The East Tunnel contractor is projecting a 61-day delay in meeting Milestone 1 based on a schedule update dated December 31, 2007. WTD indicates this update will be incorporated into the December Master Integrated Schedule, which has not yet been provided for our review.
 - In discussions with WTD, they have indicated that the December schedule from the East Tunnel contractor did not attempt to re-sequence work to make up for lost time. In addition, a more precise estimate of degree of impact to the IPS contractor will depend on final production mining rates achieved by the East Tunnel contractor, which has just started production mining.
 - Nonetheless, in the OMC's opinion, it is unlikely that the contractual date for Milestone 1 will be met, but the degree of delay is uncertain. This is because:
 - the amount of "work re-sequencing" that can be achieved with a tunneling project is minimal due to the linear nature of the work
 - the contractor's schedule already calls for two, ten hour mining shifts per day; and
 - production mining even at the contractor's planned rate of 70 feet per day (fpd) will be unlikely to make up all of the time
 - The schedule for completion of the Influent Pump Station (IPS) is closely linked to that of the East Tunnel. Delays to the IPS construction start could impact the schedule of other activities on the critical path, primarily testing of the Treatment Plant and related activities. Conflicts with the Central Tunnel contractor, who

could be retrieving its BT-2 TBM at the North Creek portal in about the same time frame, are also possible.

- Kiewit Pacific Company, the IPS contractor, is currently preparing equipment submittals and preparing a baseline schedule for submittal to WTD per the contract requirements.
- WTD is currently addressing several claims related to tunnel construction, as reported below under the "Claims/Change Orders" section.

Treatment Plant

- Two bids were received on October 25, 2007 for the Solids/Odor Control Facilities. The bids were \$167,869,000 submitted by Kiewit Pacific Company (Kiewit) and \$232,345,494 by Parsons/RCI. The Engineer's Estimate was \$193,156,599 which was about 13 percent higher than Kiewit's bid. The contract was advertised with a cost range between \$150 and \$175 million, based on earlier estimates prepared by Hoffman Construction. WTD held a bid evaluation conference with Kiewit on November 9, 2007, where WTD received responses on a number of questions they had previously submitted to Kiewit. WTD determined Kiewit to be the low, responsive and responsible bidder and has awarded the contract. WTD elected not to accept two bid alternates in the amounts of \$1,400,000 for an additional centrifuge and \$10,000 for an extended warranty. This lowered the bid price from \$167,869,000 to a contract price of \$166,459,000.
- In the OMC's opinion, Kiewit's bid appears reasonable considering that the Engineer's Estimate included an adjustment of almost \$10 million for "market conditions", and because of potential efficiencies and mobilization savings associated with Kiewit also acting as the prime contractor for the IPS.
- Earthwork is well underway on the site and is progressing smoothly. The storm water collection and treatment system at the site performed well during recent heavy rainfall events.
- Construction of formwork, tank under drains, and foundations complete or underway. Hoffman reports that difficulties in placing concrete foundations due to tight rebar spacing to meet seismic codes and other design criteria have delayed the schedule and essentially eliminated all available float. While there may be opportunities to mitigate this, it raises the possibility that the overall critical path could shift from Conveyance to the Treatment Plant.
- WTD recently relocated its offices to the former StockPot Soup building. The building it was formerly located in is scheduled to be demolished in January 2008.

System Startup Planning

WTD has initiated development of detailed plans for start-up, testing and commissioning of the entire integrated Brightwater Project. Planning includes protocols for integrating operations staff, training, start-up and commissioning procedures as well as specific plans for running clean water and waste water through the facilities to test various systems. WTD plans to issue a draft plan document in the first quarter of 2008. In our opinion, WTD is making excellent progress in looking at start-up issues early on. In the event that the Treatment Plant is ready to accept

wastewater before the conveyance system can be completed, WTD is evaluating options to recirculate water at the plant. However, this may not be necessary depending on progress of Treatment Plant work. We recommend that WTD establish a final "drop dead" date for making the decision regarding installation of piping to allow recirculation.

Follow-Up on Previous OMC Recommendations

Our previous quarterly reports have included status reports on recommendations that targeted areas which we felt could help WTD better manage cost and schedule risks associated with moving forward on the Brightwater Project. Following is a report on status of these items.

- **Aggressive outreach to the construction contracting community.** This activity entailed a number of steps to develop contractor interest in submitting bids for the Solids/Odor Control Facilities for the Treatment Plant. With the receipt of bids in late October, this activity is complete.
- **Develop a contingency plan to address potential Solids Package bid issues.** WTD developed a plan identifying and evaluating contingency options in the event Solids bids were unfavorable. With the recommendation of award to Kiewit, this activity is complete.
- **Hoffman to review scopes of Liquids and Solids Packages.** This activity is complete.
- **Develop a Master Integrated Schedule.** Contractor schedule information has not yet been accepted for the IPS and Solids/Odor Control Facilities. Marine Outfall schedule information is currently being incorporated as are schedule updates from the East Tunnel and other contractors. This continues to be a critical project management priority since the integrated schedule will allow WTD to better evaluate the schedule impacts of various project decisions.
- **Restate the 2004 Baseline Budget.** WTD has completed a restatement of the 2004 Baseline Budget into a cost reporting format that reflects the cost categories that WTD expects to use in its next trend report. This information will help track cost trends and communicate project cost data.
- **"Delegate down" specific levels of change order authority.** We have previously recommended that WTD consider delegating greater change order approval authority to the Brightwater Program Manager and construction managers. King County's Department of Natural Resources and Parks (DNRP) has reviewed its Department-wide change order approval policies. WTD subsequently prepared draft standards for delegation of signature authority. In the OMC's opinion, these standards are generally aligned with protocols other agencies have used on similar large capital projects.

Analysis/ Findings

Costs

The Brightwater Project has virtually completed its transition from design into construction. All major project components are under contract for construction except a portion of the ancillary conveyance facilities, the Environmental Education and Community Center, and final landscape installation at the Plant Site.

Table 2 summarizes 2004 Baseline Budget costs, updates reported in WTD's 2005 and 2007 Current Conditions and Trends (Trend Reports), and the OMC's conclusions based on our review of WTD's 2007 Trend Report. The final column reflects the OMC's update based on more recent information related to construction work negotiated or bid. For ease of review, all costs are shown in millions of dollars.

Table 2
Estimated Project Costs
(nominal \$M)

	WTD 2004 Baseline 3% Infl. 5% Infl.	WTD 2005 Trend	WTD 2007 Trend	OMC Estimate Based on Review of 2007 Trend (2)	OMC 1/08 Estimate at Completion (2)
Conveyance	\$1,021 - \$1,106	\$ 960	\$ 928	\$ 946 - \$ 952	\$938
Treatment Plant	\$ 640 - \$ 684	\$ 793	\$ 840	\$ 882 - \$ 911	\$904 - \$924
Total (1)	\$1,660 - \$1,790	\$1,753	\$1,767	\$1,827 - \$1,862	\$1,842 - \$1,862

Note:

1. All costs are shown in millions of nominal dollars.
2. This estimate includes actual contract values for portions of the project contracted in 2007.

Attachment A provides additional detail of construction costs, non-construction costs, contingencies, and total project costs. Not included in Attachment A are pending change orders (totaling approximately \$5.2 million) where the final costs have not yet been negotiated. Also not included are up to \$6.25 million in materials escalation provisions that could be realized as change orders.

It should be noted that both WTD's and the OMC's estimates for the Treatment Plant reflect certain assumptions about the GC/CM subcontractor bidding process.

In GC/CM contracts a Guaranteed Construction Cost (GCC) is negotiated between the Owner and the GC/CM contractor. After negotiation of the GCC, the GC/CM contractor bids out work in various packages to subcontractors. The aggregate value of all subcontracts may be different from the cost negotiated in the GCC. For the Brightwater Project, WTD has negotiated terms that provide for aggregate "subcontract buyout savings" to accrue to the County unless used for certain purposes specifically defined in the contract. If the aggregate subcontract value exceed the GCC, the County is not responsible for the additional cost. Thus, the GC/CM process limits County's risk and offers the potential to return savings to the County. In addition, a contingency

for the project is held by the GC/CM contractor, which is termed the MACC Contingency. Upon closeout of the project, any unused MACC Contingency funds are to be returned to the County.

Until the subcontractor buyout process is complete, the actual value of "subcontract buyout savings" is uncertain. In its 2007 Trend Report, WTD made certain assumptions about how much money might ultimately return to the County. At the end of 2007, the remaining MACC Contingency was approximately \$10.4 million and the buyout savings totaled approximately \$28.0 million. About 25 percent of the Liquids Package subcontracts under the County's GC/CM contract with Hoffman remain to be bid. Once complete a more precise estimate of MACC contingency and buyout savings can be made, but the OMC expects this to be between \$25 million and \$50 million at the end of the buyout phase and between \$5 million and \$25 million at the end of construction. The GC/CM contract authorizes use of the MACC contingency and buyout savings under specific conditions.

The most recent data available on Allied Costs comes from WTD's October 2007 Monthly Project Report. As of December 31, 2007, there is no indication that other Allied Costs will be substantially different from those reported by WTD in its 2007 Trend Report.

Risk Issues

WTD is using risk registers for the Treatment Plant and Conveyance activities to identify, address, and manage risks. The risk registers identify risks, categorize and classify those risks, and identify risk mitigation actions. WTD updated the Treatment Plant risk register in late November 2007. The Conveyance risk register was updated at the end of December 2007.

In our opinion, most major risk issues for the Treatment Plant are identified in the risk register. These include, for example, lack of clarity on interfaces between Solids and Liquids contracts, poor coordination between Solids and Liquids contracts, interface with East Tunnel portal construction on the treatment plant site, impacts of delivery and pricing of owner pre-selected equipment, unavailability of equipment, delays in electrical substation construction, and various subsurface risks.

Looking forward, construction activity for the Brightwater Project will continue to increase. As discussed in previous OMC reports, tunneling is a major construction risk. While we believe WTD's construction contingency levels for Conveyance are appropriate, there remain outside risks such as major tunnel obstructions that could exceed the contingency amounts.

Claims/Change Orders

To date, the number and value of claims and change orders on the Brightwater Project has been relatively low. This is due partly to the GC/CM delivery method, which specifies a Guaranteed Construction Cost for the majority of the Treatment Plant elements, and also because significant Conveyance tunneling has yet to be initiated.

- Conveyance Project change orders, pending claims, and appeals are currently at 1.8 percent of the contract award amounts. Executed change orders account for 0.9 percent. There are several pending claims and one appeal as described below.

- A \$2.0 million claim by the East Tunnel contractor resulting from last summer’s concrete plant labor strike was denied by WTD. The contractor’s appeal has been denied by the appeal officer. The claim is now in mediation.
- The East Tunnel contractor has requested a force majeure time extension claim for the bearing issues.
- Treatment Plant change orders and claims are 0.8 percent of the original contract award value. There are no pending claims or appeals as of the end of December.

Table 3 tracks construction change orders against established construction contingency budgets and the percent of construction work complete. The intent of this table is to assess whether construction change order activity has the potential to exceed the established construction contingency budgets given current information. At this point, the OMC does not have any indication that construction contingency budgets will be insufficient.

**Table 3
Change Order Tracking**

Conveyance (through December 31), \$M	
• Work under contract:	West Tunnel, Central Tunnel, East Tunnel, IPS, Marine Outfall, Some Ancillary Facilities
• Work in proposal/bidding:	Some Ancillary Facilities
Value of Brightwater construction currently under contract (w/o COs)	\$569.8
WTD construction contingency for work currently under contract (WTD 2007 Trend Report)	\$72.1
Executed Change Orders	\$5.3
Pending Requested Change Orders (includes where costs aren't yet negotiated)	\$5.5
Executed Change Orders as percent of construction under contract	0.9%
For projects under contract:	
% construction complete	28%
Executed CO as % of construction contingency	7%
Pending and requested CO as % of construction contingency	8%
Executed, pending, and requested CO as % of construction contingency	15%
Treatment Plant (through December 31), \$M	
• Work under contract:	NMA, Site Prep/EDS, Liquids Stream (including Earthworks)
• Work in proposal/bidding:	Solids, EECC
Value of construction currently under contract (w/o COs; excl sales tax outside GCC)	\$304.6
WTD construction contingency for work currently under contract	\$21.3
Executed Change Orders	\$2.5
Pending Requested Change Orders (includes where costs aren't yet negotiated)	(\$0.3)
Executed Change Orders as percent of construction under contract	0.8%
For projects under contract:	
% construction complete	17%
Executed CO as % of construction contingency	12%
Pending and requested CO as % of construction contingency	-1%
Executed, pending, and requested CO as % of construction contingency	10%

Note: All costs are shown in millions of nominal dollars.

Schedule

The most recent Master Integrated Schedule available for OMC review incorporated contractor-provided schedule status information through November 2007. At that time, contractor baseline schedules information from the IPS, Marine Outfall, and Solids contractors had not yet been accepted by WTD. (Since then, schedule information has been accepted for the Marine Outfall contractor; information from the IPS and Solids contractors is expected in February and March 2008, respectfully.)

In addition, the Master Integrated Schedule through November 2007 did not reflect a schedule update from the East Tunnel contractor since that contractor had a change order request pending with WTD for an additional 70 days due to a force majeure delay affecting delivery of the TBM. (The request was granted by WTD.) The East Tunnel contractor provided an update dated December 31, 2007. This update will be incorporated into the December Master Schedule. However, based on OMC review of the East Tunnel contractor's schedule update, it appears that there is additional schedule risk (estimated at about 61 days) to Milestone 1 – the date established for turning over the North Creek portal to the IPS contractor. In discussions with WTD, they have indicated that the December schedule from the East Tunnel contractor did not attempt to re-sequence work to make up for lost time. In addition, a more precise estimate of degree of impact to the IPS contractor will depend on final production mining rates achieved by the East Tunnel contractor, which has just started production mining.

Nonetheless, in our opinion, it is likely that the target date for meeting Milestone 1 will not be met but the degree of delay is uncertain. This is because:

- the amount of work “re-sequencing” that can be achieved with a tunneling project is minimal due to the linear nature of the work
- the contractor's schedule already calls for two, ten hour mining shifts per day; and
- production mining achieving rates of 70 fpd will be unlikely able to make up the time

Potential impacts from delaying Milestone 1 include delay in starting IPS construction work, and conflicts with the Central Tunnel contractor which is scheduled to retrieve its BT-2 TBM at the North Creek portal in about that time frame, and possibly delay of hydraulic completion of the project.

In addition, Hoffman has experienced delays related to laying rebar and pouring concrete slabs, which has used up available float. This does not mean that completion date for the Treatment Plant is delayed, and there may be opportunities to increase the float as the project progresses. Nonetheless, it raises the risk of the critical path shifting from Conveyance to Treatment at some point in the future.

In our review of the schedule, we determined that the critical interface between the Treatment Plant and the Conveyance system is the clean water circulation test, which is scheduled to start in December of 2010. Previously, the Conveyance system was clearly on the critical path for project completion, while the Treatment Plant held significant float. With delays in the East Tunnel and loss of float at the Treatment Plant, it is becoming less clear which element will ultimately be the critical path. This again underscores the importance of completing the Master Integrated Schedule, keeping it up to date, and evaluating it on an ongoing basis.

Overall Management

With the split of the Treatment Plant project into GC/CM and hard bid components, an increased effort will be required on the part of WTD to control the Treatment Plant site with multiple contractors. In light of this change, we reviewed WTD's proposed construction management organization/staffing plan and determined that an appropriate level of staffing is being provided.

WTD is currently attempting to fill the position of Construction Manager for the Treatment Plant, a spot that was recently left vacant due to the departure of a key individual. Until this individual can be identified and hired, WTD has two experienced individuals managing the Solids and Liquids contracts, supplemented by WTD's contract construction manager, CDM.

Recommendations:

Construction activity will be rapidly escalating on the project. To better manage the schedule, costs, and risks during this phase, the OMC recommends that WTD implement the following recommendations during the next quarter:

- Ensure coordination of the GC/CM and Solids package contractors at the Treatment Plant site by closely reviewing schedules and mandating communication protocols between WTD and those contractors.
- Continue to develop the Master Integrated Schedule, keep it up to date, and evaluate it on an ongoing basis.
- Take the following steps to better understand the impacts and manage the risks of delay, especially for the East Tunnel:
 - Engage and facilitate the Central Tunnel, East Tunnel, and IPS contractors in partnering sessions to develop creative solutions to the East Tunnel schedule delay, such as ways to allow multiple contractors to be working simultaneously at the IPS site.
 - On a parallel track, evaluate the overall costs and risks of a Conveyance System and/or overall project delay in terms of construction contract terms, WTD staffing and consultant costs, and other risk costs.
 - Identify the "drop dead" dates for making key decisions that affect the overall Project schedule including the decision to construct recirculation capability at the Treatment Plant; and
 - Closely monitor progress on the East Tunnel production rates and on the Treatment Plant over the next two to three months, and develop an overall project schedule mitigation plan if warranted.
- Continue with implementation of monitoring systems to gather data related to tunneling production in order to more proactively address potential construction delays and cost issues.
- Continue to coordinate with the Auditor's Office as it implements its Capital Project Oversight Program.

