



Program Evaluation and Audit

Environmental Services

**Blue Lake WWTP Construction
Projects**

October 15, 2011

INTRODUCTION

Background

Metropolitan Council Environmental Services (MCES) operates seven waste water treatment plants (WWTP), 61 lift stations, 190 meter stations, 21 rain gauge stations and 600 miles of interceptor pipes throughout the seven county metropolitan area 24 hours a day, seven days a week, 365 days a year. The seven WWTP, ranging in size from 2.5 million gallons per day (mg/d) at the Hastings WWTP to 250 mg/d at the Metropolitan WWTP in St. Paul, treat almost 265 million gallons of waste water daily. The Blue Lake WWTP (BL WWTP), located in Shakopee, treats about 30 million mg/d, has a current capacity of 32 mg/d and will expand to 40 mg/d when construction is complete. It treats waste water from 29 surrounding communities.

To maintain adequate capacity for growth, to connect existing facilities with previously unconnected communities and to maintain its facilities, MCES has identified and the Metropolitan Council (Council) has adopted a Capital Improvement Plan (CIP) of \$579 million for the six year period 2011-2016 of which \$187 million has been authorized for the construction of the following improvements to the BL WWTP:

- replacing the existing gaseous chemical effluent disinfection system with liquid chemical disinfection
- modifying the existing secondary treatment facilities to remove phosphorus
- rehabilitation of facilities nearing the end of their useful life
- improvements to the solids processing facilities and odor control
- adding anaerobic sludge digestion to supplement the existing sludge dryer for reliability and capacity
- energy recovery for dryer use
- improvements to plant utility systems, including standby power
- staged expansion of the plant's capacity

The authorized \$187 million budget includes \$55 million for Liquids (Phase I), \$65 million for liquids (Phase II) and \$36 million for Solids. Through July 2011 about \$42 million has been expended for expansion of Liquids (Phase I) processing and about \$25 million for Solids. The Phase II liquids project has not yet entered construction.

The BL WWTP Solids and Liquids projects were awarded \$2,000,000 each in ARRA funds. Along with such funds come federal Buy America Act and Prevailing Wage (Davis-Bacon ACT) regulations and greater project review by the Public Facilities Administration (PFA), the agency that administers those funds for these projects. Due to the size of this project and the additional risk associated with ARRA funding, Program

Evaluation and Audit (Audit) was asked by MCES management personnel to review contract costs and compliance with contract obligations.

Assurances

This audit was conducted in accordance with the Institute of Internal Auditors' *International Standards for the Professional Practice of Internal Auditing* and the U. S. Government Accountability Office's *Government Auditing Standards*.

Scope

This review was limited to an evaluation of the BL WWTP Liquids Phase I and Solids construction projects contract compliance and procedures, practices or policies that affected such compliance.

Methodology

To gain an understanding of the costs incurred and compliance with contract obligations regarding the expansion of the BL WWTP, the following methods of inquiry were used:

- MCES and BL WWTP construction and contract management personnel were interviewed.
- Contract documentation was reviewed and analyzed.
- Outside agency practices were researched and compared.
- MCES, Council and Metro Transit policies, procedures and work instructions were reviewed.
- ARRA regulations were reviewed.

OBSERVATIONS

Change Orders

Audit applied a 95% confidence interval with a 5% error rate to randomly sample 94 change orders (COs) totaling \$732,164 from a universe of 265 COs valued at \$2,186,984. A changed site condition was the reason for 20%, design errors/omissions accounted for 34%, MCES directed 35% and various other reasons accounted for 11% of the COs. Total value of the 94 COs was -\$31,321 less than the MCES estimate and -\$37,215 less than the Contractors' proposals. Six COs account for 86% of the difference between ES Estimate and actual CO amount. In each of these six instances, the contractor's lower quoted price was accepted as the CO amount. In most other instances, MCES also accepted the Contractor's quote if it was not substantially different from the MCES estimate. Additional summary data is as follows:

Reason	Amount	# Sampled	% of Sample	% of Amount	Av CO Amount
Site Condition	\$203,533	19	20.21%	27.20%	\$10,712
Errors/Omissions	291,942	32	34.04%	39.01%	9,123
ES Directed	192,257	33	35.11%	25.69%	5,826
Other	44,432	10	10.64%	8.09%	8,886
	\$732,164	94	100.00%	100.00%	\$7,789

Errors/omissions resulted in sampled COs totaling \$291,942, or 39% of the total value of all sampled CO. Extrapolating this to the \$2,186,984 CO universe at the time of the sample (May 2011) results in an estimated CO value for errors/omissions of \$853,231. Thru July 2011, COs had increased to 315 totaling \$2,399,476, resulting in an estimated errors/omissions CO value of 936,133, with the two projects being about 87 % (Solids) and 92% (Liquids) complete. The \$2,399.476 represents 3.39% of the \$70,873,712 combined projects contracted amount. This increased to \$2,663,408 (3.76%) through August 2011, still within the 5% CO ceiling established by Council policy for "minor adjustments to the contract" (Council Procedure 3.4.3a, *Procurement*, August 4, 2010).

Due to the Council's decision to apply for ARRA economic stimulus grants, the time available to prepare pre-solicitation ads, construction design drawings and bid documents was reduced by two months for the Liquids project and four months for the Solids project. These accelerated bid schedules reduced the time available to the design engineering consultants for performing electrical and instrumentation and control design effort and normal quality control measures for all design work. Environmental Services management personnel stated that, "we realized (this) would most likely result in additional E/Os beyond what could normally be expected." Due to these circumstances and the nature of the construction projects, it is uncertain to what extent "unintended" consultant errors arose.

As stated in MCES Work Instruction (WI) 507.03.06, *Architectural/Engineering Contract Management*, 10/31/2006, “design omissions result in change orders that increase project value. On the other hand, design errors may result in increased construction contract costs without a proportionate increase in project value. If the A/E firm is determined to be responsible for additional construction costs, potential courses of action include:

- Deduct construction cost increase from A/E firm’s invoices;
- Require separate reimbursement by A/E firm;
- Document additional services to be provided by A/E firm at no cost, in lieu of (a) or (b);
- Initiate discussion with General Counsel on potential legal action; or
- Other action as appropriate.”

Identifying which change orders result from design omissions and which ones are the result of design errors is an important step in determining the applicability of the above remedies. However, the MCES *Change Order Classification & Evaluation Sheet* does not contain an area for identifying a CO resulting from a design error.

Contract Characteristics

Both Blue Lake projects were bid by contractors significantly lower than the Council’s design engineering consultants had estimate. The combined independent cost estimates totaled \$116,572,000. The actual combined contracted amount totaled 70,873,712, a 39.2% savings.

Pre-bid and weekly progress meetings were held for both Blue Lake construction projects. In addition, all required contract documentation was available for review, either electronically or physically at the construction field offices. The pre-bid meeting minutes disclosed evidence of ARRA and WBE/MBE discussions. Audit also reviewed judgmental samples of weekly meeting minutes on both the Solids and Liquids projects. Of the 13 reports reviewed, all indicated that discussions regarding ARRA compliance had been conducted and all but one indicated that WBE/MBE goals had been discussed.

Pay Requests

Contractor monthly pay requests are submitted electronically to the CAR. The CAR and electrical and mechanical inspectors review the requests. The CAR then compiles a list of exceptions, returns the pay request and exceptions to the contractor, the contractor makes the necessary revisions and the pay request is finalized. MCES Work Instruction 507.07.08, *Payment Claims for Construction and Design Build Contracts*, July 19, 2006 states that, “The CAR will verify the requested amounts from quantity computations, daily inspector’s reports, estimates of completion made on the site, physical inventories and counts, and other records. The CAR shall review the pay request and make

adjustments where necessary. The CAR shall maintain adequate documentation to support both the review and changes (if any) made to Partial Pay Requests." The CAR complied with this procedure.

DBE Project/Progress Reports

One Assistant CAR (ACAR) reviews the monthly *DBE Project/Progress Reports* submitted by both of the contractors. The ACAR verifies that the payment information included on the report has also been included in the monthly pay request of the previous month (there is a one month delay because disadvantaged firms must be paid before being included on the report). The ACAR also works with an Office of Diversity Specialist on issues relating to a subcontractor's ability to perform. In one instance, a subcontractor was unable to finish its work. The Contractor, ACAR and Diversity Specialist worked to assess the issue and come to an acceptable conclusion. In another instance a subcontractor did not have the resources to accomplish the assigned work. Again, the ACAR, Contractor and Diversity Specialist resolved the issue in compliance with DBE regulations.

Upon completion of his review, the ACAR sends the *DBE Project/Progress Reports* to the Diversity Specialist. The Diversity Specialist manually calculates the percentages of separate WBE and MBE since the form does not contain areas for separate calculations. The Specialist stated that historically, MCES projects commit to less than what the actual turns out to be; "WBE/MBE is over-delivered."

The WBE/MBE goals for both Blue Lake projects are 11.5% and 3.5%, respectively. Audit reviewed a combined 13 monthly *DBE Project/Progress Reports* submitted by both of the contractors. These reports indicated that the percent paid to MBE/WBE subcontractors was similar to the percent that should have been paid based upon the stage of project completion at the time of the report.

ARRA Requirements

The Blue Lake Solids and Liquids projects were awarded \$2,000,000 each in ARRA funds. A review of the Solids and Liquids construction contracts disclosed that the Council's Supplemental ARRA terms and conditions were included in both contracts. The ARRA compliance packet provided by the PFA was also included in the project documentation and used by project personnel to assist in complying with ARRA requirements. In addition, from September 2009 through October 2010, Audit reviewed each invoice submitted by MCES to PFA to assure that the proper documentation was included and that the invoice complied with ARRA requirements.

The ARRA supplemental contract requirements add Buy America Act and Prevailing Wage (Davis-Bacon ACT) regulations. The result of audit of Prevailing Wage (Davis Bacon) requirements is found under *Davis Bacon Act Compliance*, below.

In order to comply with the Buy America Act requirements, the CARs for both the Liquids and Solids projects required their contractors to identify the place of origin for equipment to be installed within the two projects. In one instance, a change order was written to affect Buy America Act compliance on the Solids project. As stated, “the contractor was unable to find chemical transfer hose manufactured in the United States with the properties and lengths originally specified for the project. The project design engineer was able to slightly reduce the chemical resistance requirements for the hose and thus find a manufacturer in the United States that produced chemical transfer hose with the lengths required to meet the project requirements.” In another instance on the Liquids project a change order was written to also effect Buy America Act compliance. As stated, “boilers arrived on site and after the first boiler was partially installed, a “Made in Canada” nameplate was discovered on the unit. The contractor was able to find a boiler that met the requirements of the specifications and was manufactured in the United States. This boiler was approved by the engineer for use on the project.”

In one instance, the Solids CAR and contractor conducted a thorough search for a domestic manufactured sludge screen, but could not locate one. The Project Manager and CAR then guided the contractor through the required waiver request process in compliance with ARRA Buy America Act requirements. Documentation of monthly pay request Buy America Act certifications and an ARRA documentation log that tracked all on-going ARRA compliance issues are further evidence of project personnel being committed to assuring that the Blue Lake Liquids and Solids projects comply with ARRA requirements.

Davis Bacon Act Compliance

The Davis-Bacon Act does not provide specific guidance regarding the number and frequency of either certified payroll reviews or on-site workforce interviews. Audit conducted a review of Council, outside agency and state regulatory procedures to determine if a standard existed upon which to base a conclusion regarding compliance by MCES Blue Lake construction field office staff. As disclosed below, no such standard could be found.

Certified Payroll Reviews

The review of outside agency procedures disclosed that for one agency, a spot check of a representative sample be conducted based on assessed risk of non-compliance with a minimum once within two weeks of project initiation and again two weeks prior to completion of work. Metro Transit Work Instruction C-50 requires that for projects six months or longer, the CAR is to review random certified payrolls at least once every three months. Environmental Services WI 507.07.01, *Certified Payroll Review of Capital Projects*, July 26, 2005, requires a random check of certified payrolls by “reviewing any two payroll periods from the contractor and subcontractor per year.”

There does not appear to be a standard for reviewing certified payrolls. The BL WWTP Assistant CAR (ACAR) used an efficient and effective on-line system for submission and review of contractor and sub-contractor certified payrolls. The ACAR was very systematic in reviewing wage rates of every worker listed on every weekly certified payroll, identifying non-compliant rates and resolving differences with the contractor. The ACAR conducted more reviews than required, for according to standard practice and the MCES Work Instruction, a certified payroll review is not conducted for every submitted payroll. However, such a thorough review was conducted to reduce the risk of non-compliance due to ARRA funding.

On-Site Workforce Interviews

A review of outside agency procedures and PFA ARRA guidance revealed a common practice of spot checking a representative sample and schedule of reviews based on an assessed risk of non-compliance with a minimum of one review within two weeks of the initial certified payroll submission and two weeks prior to the completion of work. Another agency required a minimum of one interview or 10% of the on-site workforce each time interviews were conducted. Yet another agency required at least one interview for each contractor/sub throughout the life of the project, and for multi-year projects, once with all contractor/subcontractors each season. Metro Transit Instruction C-50, *Certified Payrolls*, July 1, 2008, requires “random interviews at least once every six months... with an effort made to obtain a cross section of the workforce and at least 10% of the workforce is to be interviewed.” Environmental Services, however, has no formal Work Instruction regarding conducting on-site workforce interviews.

The same ACAR that conducts certified payroll wage rate reviews for both projects also conducts the interviews of contractor and subcontractor workers. According to the ACAR, on-site interviews are conducted at least once (at the time the contractor/subcontractor begins work) and possibly a second time (close to the completion of work). The ACAR stated that, according to PFA guidance that is the extent of interviews required for Davis-Bacon ARRA compliance. However, contract specification 00865, *Certified Payroll Form*, is not as specific, stating that “the Council may perform random interviews of employees.” In addition, a review of all interviews conducted to date revealed the following:

- Liquids: 11 interviews were conducted with workers from 10 different firms between the period 9/10/09 through 7/22/11. Seventeen firms were on site during some period of time in 2009. Interviews were conducted with workers from eight of those firms, none within the two week period. No interviews were conducted with nine of the firms.
- Solids: 12 interviews were conducted with workers from 12 different firms between the period 10/09/09 through 6/6/11. Eleven firms were on site during some period of time in 2009. Interviews were conducted with workers from four of those firms; one within the two week period. No interviews were conducted with seven of the firms.

CONCLUSIONS

In general, MCES contract management personnel perform their contract compliance duties according to Council and MCES policies and procedures. BL WWTP Liquids and Solids construction project documentation contains examples of concern with abiding by ARRA Buy America Act requirements. Contractor monthly pay requests are reviewed and documented as are change orders and monthly DBE Progress/Process reports. In addition, documentation shows coordination of efforts between MCES, Diversity and contractors regarding WBE/MBE goal compliance. Reviews of all contractor and sub-contractor certified payrolls are conducted and on-site employee interviews are also performed to verify Davis Bacon prevailing wage regulations. ARRA, Buy America, WBE/MBE and Davis Bacon regulatory compliance and change order management are all high risk areas. With the following exceptions, MCES manages these tasks in compliance with Council and MCES policies and procedures:

1. MCES has a formal written procedure for conducting certified payroll reviews and performed them in greater quantities than required. However, MCES does not have a written procedure for conducting on-site workforce interviews and performs them less often than personnel have stated.

MCES contract management personnel assigned to the BL WWTP Liquids and Solids construction projects review every worker appearing on every certified payroll received from their contractors and sub-contractors to ensure that workers are being paid the prevailing wage. This is a greater effort than required by MCES procedures; however, the system used to conduct such reviews is efficient and effective and it does provide additional assurance of compliance with Davis Bacon and Minnesota prevailing wage requirements due to ARRA funding.

MCES does not have a formal procedure for conducting on-site workforce interviews, another measure that is used by outside agencies and Metro Transit to ensure compliance with Davis Bacon prevailing wage regulations. MCES personnel do conduct on-site interviews, but have done so less frequently than required by PFA ARRA guidance. In addition, MCES has no formal guidance outside the “random interview” standard stated in the contract specification upon which to base their tests.

2. MCES has formal written procedures for initiating, negotiating and finalizing construction project change orders, including defining and resolving design engineering errors that affect an increase in project costs. However, the initial document used to classify change orders as design errors is silent regarding such a classification.

MCES WI 507.07.05, *Change Orders*, details the full change order process from initiation to finalization, including detailed responsibilities for each party within the process. In addition, MCES WI 507.03.06, *Architectural/Engineering Contract Management*, defines “omissions” and “errors” and includes recommended remedies for

the latter. Design omissions are changes that MCES would have paid for had they been included in the bid documents prepared by the design engineer consultant; design errors are not. For that reason, design errors should be separately identified on the initiating *Change Order Classification & Evaluation Sheet*. Currently they are not.

RECOMMENDATIONS

Program Evaluation and Audit recommendations are categorized according to the level of risk they pose for the Council. The categories are:

- **Essential** – Steps must be taken to avoid the emergence of critical risks to the Council or to add great value to the Council and its programs. Essential recommendations are tracked through the Audit Database and status is reported twice annually to the Council’s Audit Committee.
- **Significant** – Adds value to programs or initiatives of the Council, but is not necessary to avoid major control risks or other critical risk exposures. Significant recommendations are also tracked with status reports to the Council’s Audit Committee.
- **Considerations** – Recommendation would be beneficial, but may be subject to being set aside in favor of higher priority activities for the Council, or may require collaboration with another program area or division. Considerations are not tracked or reported. Their implementation is solely at the hands of management.
- **Verbal Recommendation** – An issue was found that bears mentioning, but is not sufficient to constitute a control risk or other repercussions to warrant inclusion in the written report. Verbal recommendations are documented in the file, but are not tracked or reported regularly.

1. (Essential) MCES should revise its procedures regarding compliance with Davis Bacon prevailing wage requirements to include guidance for on-site workforce interviews.

On-site workforce interviews are an accepted and common method of verifying that contractors and sub-contractors are paying their workers the prevailing wage, a requirement of the Davis Bacon Act and for receiving federal funds. Metro Transit has a written procedure for conducting such interviews. MCES should likewise have such a procedure so that all applicable MCES employees have common knowledge regarding verifying contractor/sub-contractor compliance with Davis-Bacon Act requirements.

Management Response: *We agree. Construction Services Section of Technical Services Department will update the MCES Work Instruction, Certified Payroll Review of Capital Projects (507.07.01) to include guidance for conducting wage reviews in compliance with Davis-Bacon Act requirements.*

Staff Responsible: *Manager, Construction Services*

Timetable: *Mid November 2011*

2. (Significant) MCES should revise the *Change Order Classification & Evaluation Sheet* to include an identifying area for design engineering consultant errors that result in increased project costs.

Design engineering consultants are hired by MCES to produce project designs, drawings and bid specifications, among other end items. Errors in those documents upon which contractors develop their bids can result in change orders that increase the project cost once the construction project has begun. It is a normal business practice of firms to be responsible for their end products and likewise, design engineering consultants should be held responsible for errors in their work. The current MCES change order procedure specifies possible remedies when change orders are written due to design errors. However, the initiating document, the *Change Order Classification & Evaluation Sheet*, has no place for classifying change orders in such a manner.

Management Response: *Change orders must be evaluated and processed expeditiously to avoid potential contractor claims. Further, the classification of a change order's cause as design error must carefully consider the engineering standard of care provision of the engineering contract as well as the specific project circumstances. This evaluation process should be handled through an independent evaluation by the Engineering and Construction Managers. For these reasons, the Change Order Classification & Evaluation Sheet does not include a specific classification for Design Errors. However, this sheet will be modified to provide a referral to these managers to evaluate the potential for an engineering error, responsibilities, and costs, in accordance with MCES Work Instruction, Architectural/Engineering Contract Management (507.03.06).*

Staff Responsible: *Manager, Construction Services*

Timetable: *Mid November 2011*