



EMA, Inc.
 1970 Oakcrest Avenue
 St. Paul, MN 55113-2624
 651.639.5600
 651.639.5730 fax
 www.ema-inc.com

Linking People & Technology for Business Results

August 11, 2004

Adam Kramer
 Director, Minneapolis Water Works
 250 South 4th Street
 Room 206
 Minneapolis, MN 55415-1330

Subject: MWW SCADA Project
 Change Order

Dear Adam,

MWW and EMA have teamed successfully to implement the new SCADA System. The design work on the system is near completion. Implementation and construction of the remaining parts is underway. We have reviewed the SCADA project budget, schedule and deliverables with MWW Staff. The result of this review is that additional SCADA points have been incorporated into the system that were not a part of the original master plan. Enhanced concerns and procedures for security, a better understanding of our process capabilities and the management of critical process information have been implemented since our original contract was put in place. These changes have utilized additional resources that we could not have reasonably anticipated.

We have identified performed work that has enhanced the original master plan. We have also identified the enhanced scope of work at the Fridley Filter and Softening Plants and contingency items that will impact the system in the near future. To maintain a similar level of EMA involvement for the remainder of the project requires an increase in the budget. Therefore in accordance with the Contract, EMA is requesting a Change Order to modify the contract dollars limits.

The Change Order consists of three attachments and two letters of agreement. Attachment A, The Master Plan Scope Adjustments; Attachment B, Enhanced Implementation Scope, and Attachment C, Contingency Items for additional work that MWW may elect to complete as a part of the project. These attachments reflect work remaining that requires a project scope adjustment and additional funding. The two Letters of Agreement address remaining work that EMA agrees to complete at no additional cost to the City.

The Change Order is broken down as follows:

Attachment	Item	Cost
A	Master Plan Scope Adjustments	\$302,133
B	Enhanced Implementation Scope	\$462,746
C	Contingency Items	\$307,000
	Total Change Order Requested	\$1,071,879

Mr. Adam Kramer
August 11, 2004
Page 2

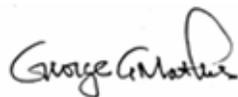
Prior to work on any Enhanced Implementation Scope or Contingency items, EMA will request authorization in writing from MWW to proceed with the work. Upon authorization of the request by MWW, EMA will proceed with the authorized services.

The current contract calls for completion of the work by December 31, 2004. Based on the discussion with MWW, the current construction schedule calls for the remaining work to be completed no later than 6/31/2006. As a part of the amendment, we are requesting that our contract term be extended through 6/31/2006.

We look forward to continuing our working relationship with Minneapolis Water and completing this project with you. We appreciate your consideration of our request for a Change Order. If you have any questions please call me.

Best regards,

EMA, Inc.

A handwritten signature in black ink that reads "George A. Mathes". The signature is written in a cursive style with a large initial "G".

George A. Mathes
President, CEO

C: Rob Verke
Joe Geiser
File 5406.015 Correspondence1

Attachment A: Master Plan Scope Adjustments

EMA has reviewed the work completed under the contract and identified services and deliverables that are in addition to the Master Plan Scope of Work.

SCADA Site Implemented Through 2003:

As a part of the Master Plan, EMA anticipated that the SCADA facilities completed to date would involve the installation of 2193 points. Completed facilities include the Pumping Stations 1,2,3,4,5,6,7,8,9, North High, South West, Kenwood, softening treatment residual ponds, LOTP, Columbia Heights Filter Plant, control valves, Washburn Water Tower and Hill Top Reservoir. Through the design and validation process the point count for these sites increased to 3,538 points.

The increase in implemented points is a direct result of a better understanding of the capabilities and value of SCADA technologies. Points have been added to better protect the safety and security of water produced and to provide enhanced treatment capabilities to our processes and facilities. These points were identified and incorporated into the design and construction of the system.

A detailed review of the installed points shows EMA was responsible for the installation of 2,968 points. This represents an increase of 775 points more than was originally planned. Each of these points represents an increase in the design, implementation, and construction of the SCADA System that exceeded what was identified within the SCADA Master Plan.

MWW and EMA jointly developed a methodology to evaluate the increased costs based on the number of points installed within the system. The following table is based on that methodology and reflects the increased cost to design, implement, and construct these additional points within the system.

Description	Points	Dollars (Includes Expenses)
Not Included In Original Scope	775	\$302,133
Total Additional Cost	775	\$302,133

Attachment B: Enhanced Scope Items

EMA has reviewed the contract Work completed to date and assessed the services and deliverables to complete the remaining work at the Fridley Filter Plant (FFP) and Fridley Softening Plant (FSP) with a similar automation level. The systems at both of these facilities have expanded beyond what we had originally anticipated in the Master Plan. To provide implementation support at a similar level to the facilities completed to date will require an increase in the project budget.

Task 1: Additional Bid Support (1.13)

Since the start of the project, there has been a substantial change in the security requirements that impact the bidding process. These changes result in more detailed plans and specifications as well as increased bid and construction times, Now scheduled through July 2006. As result EMA has been requested to provide additional on-site support for the bidding of the remaining projects. EMA will provide a narrated picture book for each of the remaining facilities to be provided to the contractors as a part of the bid package. In addition EMA will attend two additional on-site plant site visits to assist in answering contractor questions and provide clarifications to the specifications over this period.

Deliverables: Provide additional hours of bid and contract award support for each of the remaining facilities. This includes Fridley Filter Plant and Fridley Softening Plant.

Task 2: Fridley Filter Plant

Through the analysis of the Fridley Filter Plant by the POM and PCS Design Teams, additional control and monitoring points have been added beyond the scope of the original contract. The initial plan for this facility called for the monitoring and control of 592 points. Through the design process 943 more points have been added to the design to allow additional monitoring, control and security using the SCADA System. The total point count at this time is 1535 points to monitor and control this facility. The design work has been completed for all Critical 1 and 2 Points identified through the MWW validation process. This facility has been bid at this level of automation and a contract has been award. The remaining work at this facility includes the implementation of the system and construction support services. The addition of these points to this facility has increased the scope of work beyond the original contract for the implementation and construction of the system.

Deliverables: Implementation and Construction Support Services

Task 3: Fridley Softening Plant

The POM and PCS Design Teams are completing the review of the Fridley Softening Plant level of automation at this time. Due to the size of this facility, the age of the equipment and the increased understanding of the SCADA System it is anticipated that the level of automation may increase beyond the current contract scope. The initial plan for this facility called for the monitoring and control of 1217 points. The final point count for this facility will be based on MWW's validation of the process narrative, process and instrumentation diagrams, input/output point list, costs and approval.

Deliverables: Implementation and Construction Support Services

Task 4: Dewatering Plant

The Master Plan included work at the Dewatering Plant. Through the course of the project the needs at this facility has changed due to the new Membrane facility. Work at this facility will be completed under separate contract. As result, there is a credit due MWW for work at this facility.

Task 5: Remote sites

This Master Plan included pressure and flow telemetry from each of the listed sites. Initial design and development work for these sites has been completed. The construction and implementation will be completed under a separate Contract. As result, there is a credit due MWW for work at this facility.

1. Control Valve, Knox 60th
2. Control Valve, Oliver 60th
3. Columbia Heights Flow Monitor
4. Crystal/New Hope Flow Monitor
5. Edina Flow Monitor
6. Golden Valley Flow Monitor 1
7. Golden Valley Flow Monitor 2
8. International Airport Flow Monitor 1
9. International Airport Flow Monitor 2
10. VA Hospital Flow Monitor

Task 6: Membrane plant data collection pilot.

Purpose: This pilot is intended to test the performance capabilities and intended data collection, compression and reporting strategies identified by EMA in the Evaluation of I-Historian and related software for the CHMP. The information gathered from this pilot will assist in defining and validating the available options.

1. Meet with MWW to establish Minneapolis Water and EMA roles to most effectively pilot high-speed data capture using Cimplicity, Oracle and I-Historian. EMA and MWW will jointly work on the pilot. MWW will assume responsibility for setting up the necessary hardware and software to be able to conduct the pilot with input and assistance from EMA.
2. Two pilot projects will be established.
 - Pilot high-speed data gathering utilizing Cimplicity with Oracle the Cimplicity/Oracle pilot will be configured to provide both group and data logging and compression. Several versions of this pilot may be necessary to fully evaluate the capabilities.
 - Pilot high-speed data gathering and reporting utilizing Cimplicity with I-Historian similar to the Cimplicity / Oracle pilot.
3. EMA will configure high-speed data points for collection by Cimplicity and initiate the pilot. ControlLogix processors or simulated points will be utilized to replicate this high speed data acquisition. EMA will review the initial results of the pilot to determine potential issues and modifications necessary to provide the best evaluation of the capabilities.
4. Once the pilot is fully configured EMA will routinely check the status and the results of the pilot. It is assumed that once fully configured, the pilots would continue to run a minimum of 7 days for both the Cimplicity/Oracle and Cimplicity/I-Historian to provide adequate data for further analysis. Upon completion of the 7 days EMA would analyze the results, this would include disk space utilized, and how alarms and events were handled

Provide MWW a technical memo on the results of the pilot. Based on the pilot identify the most effective solution for handling the high-speed data collection.

Summary of Costs

Task	Description	Contingency Hours	Cost
Task 1	Additional Bid Support	250	\$ 30,000
Task 2	Fridley Filter Plant	1,856	\$222,813
Task 3	Fridley Softening Plant	2,082	\$249,851
Task 4	Dewatering Plant Credit	-258	-\$31,007
Task 5	Remote sites Credit	-199	-\$23,911
Task 6	Membrane system data collection pilot testing	125	\$15,000
	Total	3,856	\$462,746

Attachment C: Contingency Items

EMA has reviewed the contract Work as completed to date and assessed the services and deliverables that may be required in the future to complete the remaining MWW facilities at a similar level of automation. Any Work additions to the contract must be accompanied by a clearly defined and City approved Scope of Work. Any contingency approvals must be demonstrated to be in addition to or a City requested deviation from our current Contract requirements. The following list is potential work that MWW may request and authorize:

Task 1: Technical Design Standards (1.2)

MWW is moving forward with new equipment and design enhancements that are not covered within the current design standards. This includes the Allen Bradley ControlLogix processors, associated Input/Output Interface cards and devicenet communications. In addition, a format revision to enhance the user friendliness of the standards has been identified. The format and content of the standards will be revised to address new system demands and needs of Professional designers and Contractors.

EMA will provide technical support and work with the PCS design team to update the current design standards, incorporating new equipment and design enhancements and construction practices. EMA will also provide technical support to revise the current standards format into a professional design memorandum and CSI / AIA construction sections format.

Task 2: E-Ops Support

EMA will provide E-Ops operational report development services directly to MWW plant supervisors and managers

Task 3: SCADA Support

1. Network Expansion

MWW is in the process of building a new shop and other improvements within the grounds at Fridley. To allow for computer connections it will be necessary to upgrade the existing fiber optic network on the south end of the Fridley Plant.

2. System Support

Over the course of the project, MWW has requested additional Engineering, Cimplicity, Network and OMS support that fall outside the scope of the existing work. To address these support needs, MWW and EMA have incorporated small support contracts in these areas that are controlled by MWW. Based on our experiences to date, EMA recommends that additional funds be incorporated into the contingency dollars to address these needs as the funds in the existing support contracts are used up.

Task 4: Change Management Support

Over the course of the remainder of the project MWW may require additional assistance with organizational issues and additional training. EMA recommends that MWW include a contingency for additional support for the change program to support and address these issues.

Task 5: Membrane Plant Integration

The specifics of this task will be developed upon completion of the Membrane Plant SCADA Integration analysis and pilot is completed. EMA will work to implement the findings and chosen integration path for this facility. Specific deliverable language will be developed.

Summary Of Approximate Contingency Costs

Task	Description	Contingency Hours	Cost
Task 1	Technical Design Standards Update	200	\$ 25,000
Task 2	E-ops Support	430	\$ 52,000
Task 3	SCADA Contingencies <ul style="list-style-type: none"> • Network Expansion • Additional system support, engineering, Cimplicity, Network, and OMS 	580	\$70,000
Task 4	Change Management Support	415	\$ 50,000
Task 5	Membrane Plant Integration	900	\$ 110,000
	Total Contingencies	2525	\$307,000