

Minutes - Standing Policy Committee on Finance - November 26, 2015

REPORTS

**Item No. 6 Water Supervisory Control and Data Acquisition (SCADA) Upgrade
Financial Status Report No. 3 for the Period from May 1, 2015 to
September 30, 2015**

STANDING COMMITTEE DECISION:

The Standing Policy Committee on Finance concurred in the recommendation of the Winnipeg Public Service, namely:

1. That the report be received as information.

2. That the next status report be provided at the proposed April 2016 Standing Policy Committee on Finance.

Minutes - Standing Policy Committee on Finance - November 26, 2015

DECISION MAKING HISTORY:

Moved by Councillor Lukes,

That the recommendation of the Winnipeg Public Service be concurred in.

Carried

ADMINISTRATIVE REPORT

**Title: WATER SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA)
UPGRADE FINANCIAL STATUS REPORT NO. 3 FOR THE PERIOD FROM
MAY 1, 2015 TO SEPTEMBER 30, 2015**

Critical Path: The Standing Policy Committee on Finance

AUTHORIZATION

Author	Department Head	CFO	CAO/COO
G. K. Patton, P. Eng. Manager of Engineering Services	Moira Geer, CPA, CA Acting Director of Water and Waste	M. Ruta	M. Jack COO

RECOMMENDATIONS

1. That this report be received as information.
2. That the next status report be provided at the proposed April 2016 Standing Policy Committee on Finance.

REASON FOR THE REPORT

Administrative Directive No. FM-004 requires quarterly reporting to the Standing Committee on Finance.

EXECUTIVE SUMMARY

This report is to provide a quarterly update on the status of the Water Supervisory Control and Data Acquisition (SCADA) Upgrade Project. This capital project is financed from the approved Capital Budget for Water Supervisory Control and Data Acquisition (SCADA) Upgrades.

IMPLICATIONS OF THE RECOMMENDATIONS

The delivery method for this project is under review.

The next report will be deferred by two months from the February 2016 Standing Policy Committee on Finance to April 2016 as the project delivery method is under review and it is not anticipated that significant activity will occur during the next reporting period. A return to quarterly reporting will be evaluated at the time of the next report.

HISTORY / DISCUSSION

DISCUSSION:

1. MAJOR CAPITAL PROJECT STEERING COMMITTEE

Administrative policy for projects with capital cost exceeding \$20 million requires formation of a Major Capital Project Steering Committee. This threshold was approved by Council on October 28, 2015. Any project reporting to SPC Finance under the previous \$10 million threshold will continue to report. The Committee has been formed and its members are:

Diane Sacher, Director of Water and Waste
Clive Wightman, Director, Community Services
John Kiernan, Director, Planning, Property and Development
Jason Ruby, Manager of Capital Projects
Moirra Geer, Manager of Finance and Administration, Water and Waste
Geoff Patton, Manager of Engineering, Water and Waste
Rob Carroll, Project Manager, Water and Waste

2. DESCRIPTION OF PROJECT

The Water Services Division utilizes a Regional SCADA control system to operate, control and monitor processes at the Shoal Lake Intake Facility, regional pumping and booster stations, and the Deacon Chemical Feed Facility. The Regional SCADA provides automated control and visualization of the water supply and distribution system to operators on a 24/7 basis so they can control and monitor these processes. The Regional SCADA system is made up of instrumentation, remote communication equipment and specialized computer hardware with customized software, such as Programmable Logic Controllers (PLCs). The regional pumping and booster stations as well as the water supply intake at Shoal Lake are controlled locally via PLCs and are monitored remotely via the City's Regional SCADA.

The Regional SCADA is comprised of server hardware and software that are approaching end of life. Further, the PLCs at the aforementioned locations have also reached the end of their useful life and are no longer produced by their manufacturer.

The project objective is to upgrade the Regional SCADA and PLCs to ensure timely replacement of end of life hardware and software. The Regional SCADA and PLCs are essential for the supply and distribution of drinking water. Design-build is being considered for the project delivery method for the Regional SCADA and PLC upgrade project, however further evaluation is needed and will take place during the next reporting period.

3. RISKS AND RISK MITIGATION STRATEGIES

An ongoing risk management strategy has been implemented for the project encompassing a proactive process of identifying and assessing project risk, defining appropriate risk handling strategies and plans, and monitoring those actions to completion.

Formal risk and opportunity analyses of the project are scheduled to be performed by the project team at major milestones as the project progresses.

4. CURRENT PROJECT STATUS

A preliminary design for the PLC upgrades was completed in 2013. This predesign was undertaken in conjunction with the predesign of power reliability upgrades required at the pumping stations.

The Department currently has two water SCADA system providers, Telvent, which is used for the regional water system, and Wonderware, which is used for the water treatment plant. A Regional SCADA Upgrade Life Cycle Cost Analysis was completed in June 2015. The analysis considered two options for upgrading the regional SCADA system:

1. Updating the existing Telvent system
2. Replacing the existing Telvent system with a Wonderware system

The analysis considered costs for hardware, software and support agreements over a 25 year period. The report found that Wonderware was the preferred option having the lowest life cycle cost.

Through internal discussions it was suggested that this project may be better delivered as a design-build rather than as design-bid-build. The primary reasons for this are as follows:

- Commissioning of the new SCADA system, programming the upgraded PLCs, and coordinating operational shutdowns to perform the work are all large components of the project in comparison with construction. With a traditional design-bid-build procurement model, the roles and responsibilities for shutdown coordination and commissioning can be unclear. It was felt that these responsibilities could be better defined with a design-build procurement methodology. Additionally, performance measures can be established to ensure that the design-build contractor is fulfilling their complete role.
- Specialized expertise is needed in order to complete the project. In the event that design-build is selected as the delivery method, an owner's advocate engineer will be engaged to assist with the development of the design-build request for proposal and provide guidance to the City during the process.
- With a design-build contract, the City only has one contractor responsible for the design and construction works. With the specialized knowledge requirements for this project, this is beneficial as the system integration contractor's knowledge can be used during design, rather than only at construction, and the design consultant's expertise can be used more effectively as they are directly involved in not only the design but also the construction and commissioning of the works.
- A design-build strategy will help to reduce the schedule as design and construction can happen simultaneously and the schedule can be contractually firm at the initiation of the design build contract.

The Department is currently evaluating the benefits and risks of delivering this project as a design-build instead of as a traditional design-bid-build.

5. ISSUES/RISKS REQUIRING FURTHER ATTENTION

Cost Risk

The cost estimate of \$9 million for engineering and construction for the PLC upgrade work is based on a Class 3 estimate prepared as part of the preliminary design with an expected accuracy range of between -20% to +30%.

The cost estimate for the Regional SCADA upgrade has been refined from a Class 5 estimate of \$3.3 million to a Class 4 estimate of \$3.1 million based on the results of the life cycle cost analysis completed during this reporting period. The current estimate is slightly lower than the original estimate, however the Department is not recommending a change in the requested budget at this time due to the class of the estimate. The updated cost estimate has an expected accuracy range of between -30% and +60%.

It is AACE International accepted practice that cost estimates are adjusted as design progresses.

Schedule

The PLC upgrades will be undertaken in conjunction with power reliability upgrades required at the pumping stations in order to reduce pumping station shut-down times and potentially reduce design and construction costs. Any design or construction delays related to the power reliability upgrades have the potential to affect the schedule of the PLC upgrades. As station shut downs will only be permitted during periods of low demand and as no more than two stations will be upgraded at one time (to minimize potential risk to the distribution system), design issues can be dealt with in advance of or between station upgrades. Construction issues will be minimized through careful construction planning. Further, lessons learned through the sequential station upgrading will be applied to succeeding upgrades.

6. FINANCIAL ANALYSIS

The status of current Requests for Proposal and Bid Opportunities are as follows:

Request for Proposal or Bid Opportunity	Description	Current Status	Contract Value (GST and MRST extra as applicable)
RFP 224-2012	PLC Replacement and Power Reliability Upgrades Preliminary Design	Completed by SNC Lavalin Inc.	\$315,562.96
Sole Source Consultant Assignment 307-2012	Equipment Identification Standard and Electrical Design Guide Development	Completed by SNC Lavalin Inc.	\$46,947.84
Consultant assignment under \$35,000	Regional SCADA Life Cycle Cost Analysis	Completed by Dillon Consulting Ltd.	\$35,000.00

Future major Requests for Proposal and Bid Opportunities are dependent on whether design-bid-build or design-build is selected as the delivery method:

Design-bid-build:

- Request for Proposal – Detailed Design, Programming and Contract Administration for PLC, Regional SCADA and Power Reliability Upgrades
- Bid Opportunity – Regional SCADA Upgrade
- Bid Opportunity – PLC and Power Reliability Upgrades (may be split into multiple Bid Opportunities)

Design-build:

- Request for Proposal – Owner’s advocate engineer for PLC, Regional SCADA and Power Reliability Upgrades
- Request for Qualifications – Design & Build PLC, Regional SCADA and Power Reliability Upgrades
- Request for Proposal – Design & Build PLC, Regional SCADA and Power Reliability Upgrades

Project funding

The approved capital and 2015 projected budget are as follows:

YEAR	CAPITAL PROGRAM	ACTUAL + PROJECTED CASH FLOWS	CUMULATIVE CAPITAL BUDGET REMAINING
2015 To Date	8,400,000	402,339	7,997,661
Remainder 2015		0	7,997,661
2016	3,900,000	2,834,136	9,063,525
2017		5,621,996	3,441,529
2018		1,314,432	2,127,097
Total Costs Remaining to Complete		2,127,097	0
Total	12,300,000	12,300,000	

A summary of the budget to forecast comparison is contained in Appendix 1.

The Water SCADA upgrade project is funded by retained earnings.

7. ANTICIPATED PROGRESS DURING NEXT REPORTING PERIOD

An evaluation of the delivery method for this project will be conducted during the next reporting period. Once the evaluation is complete the next stage of the project is to issue and award a Request for Proposal for either an Owner’s Advocate Engineer or for Detailed Design, Programming and Contract Administration. The status of this work will be included in the next status report.

FINANCIAL IMPACT

Financial Impact Statement

Date: October 20, 2015

Project Name:

**WATER SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) UPGRADE
FINANCIAL STATUS REPORT NO. 3 FOR THE PERIOD FROM MAY 1, 2015 TO
SEPTEMBER 30, 2015**

COMMENTS:

As this report is submitted for informational purposes only, there is no financial impact associated with this recommendation.

Original Signed by

Lucy Szkwarek, CPA, CGA
Acting Manager of Finance and Administration

CONSULTATION

In preparing this report there was consultation with:

N/A

OURWINNIPEG POLICY ALIGNMENT

This report is in accordance with the OurWinnipeg policies through providing clean, safe, reliable, sustainable drinking water.

OurWinnipeg Reference: City Building

SUBMITTED BY

Department: Water and Waste
Division: Engineering Services
Prepared by: R. Carroll, P. Eng.
Date: October 22, 2015
File No.: W-761
c: Major Capital Project Steering Committee (email)
Geoffrey Patton, P. Eng., Water and Waste Department (email)
R. Carroll, P. Eng., Water and Waste Department (email)

ATTACHMENTS:

Appendix 1 – SCADA Upgrade Estimated Costs and Project Costs to Complete

**WATER SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) UPGRADE
WATER AND WASTE DEPARTMENT - ENGINEERING DIVISION
APPENDIX 1
As at September 30, 2015**

Components	COSTS			PROJECTED COSTS TO COMPLETE					TOTAL	VARIANCE	NOTE
	Approved Budget To Date ¹	Costs submitted this report	Total Costs Incurred to Date (to Sept 30, 2015)	2015	2016	2017	2018	Total Costs Remaining to Complete	Total Project Cost	Variance from Budget (Unfavourable)	
A PROFESSIONAL SERVICES	\$5,502,339	\$1,400	\$402,339	\$0	\$2,834,136	\$1,996,335	\$82,932	\$186,597	\$5,502,339	0	²
B CONSTRUCTION	\$6,797,661	\$0	\$0	\$0	\$0	\$3,625,661	\$1,231,500	\$1,940,500	\$6,797,661	0	
TOTALS	12,300,000	\$1,400	\$402,339	\$0	\$2,834,136	\$5,621,996	\$1,314,432	\$2,127,097	\$12,300,000	0	

Percentage Complete 3%

- 1 Total budget of \$12,300,000 for the Water SCADA Upgrade Project; Distribution of costs to Components A) and B) was done by the Water and Waste Department. The budget included \$9 million for PLC upgrades and \$3.3 million for SCADA upgrades. The cost estimate for the SCADA upgrades has been refined to \$3.1 million, however a change in budget is not recommended at this time.
- 2 Professional Services include Professional Engineering Services (preliminary design, life cycle cost analysis, detailed design, programming and contract administration), overhead and administration charges.