REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY, 26 JULY 2006

SUBJECT   CORE AREA SCADA UPGRADE

PURPOSE

To replace the core area supervisory, control and data acquisition (SCADA) system software and the SCADA system radios. The technologies are outdated and failing and the software no longer has factory support.

BACKGROUND

The core area sewer system has a computerized SCADA system. The principal function of the SCADA system is to control the operation of the sewer system and various pumping stations. It also collects data of the various operating functions, including flows for cost sharing, and it generates alarms if and when there are failures. The core area sewer system has been managed by a SCADA system for over 30 years. But over the years, the SCADA system has evolved and improved.

In earlier years, operators would check on a pump station once per day to see if it was functioning correctly. With our SCADA system, we now check the operation of all the pump station functions once every two minutes. The sewer system is completely automated. The operators now clean and service the system's equipment and set the operating parameters on the SCADA. The SCADA system communicates between stations by means of radio signals and all of the information is centralized at the Macaulay operations centre. If there are alarms, the SCADA system notifies the duty operator.

There are two items that are employed in the SCADA system that now require replacement. One is the operating software and the other is the SCADA data radios.

SCADA Software

The existing SCADA software is used by both the Environmental Services and Water Services departments for all the SCADA systems that the two departments operate and it is a QNX-based operating system. This software has been in operation with the Capital Regional District (CRD) for approximately 20 years. It has been upgraded on a regular basis but is now at the end of its useful life. The company that sells the SCADA software is having problems developing support for the modern technologies. A panel of electronic technologists from both the Environmental Services department and the Water Services department reviewed the SCADA software packages available in the market today, including the software that we currently employ to determine the best software for both departments for the future. The conclusion was to switch to a product called Clear SCADA, which is a Windows-based operating system. It was planned that the initial installation of the new SCADA software program would be the core area sewer system, as this is one of the larger SCADA systems that we operate and the current software was straining to support the hardware. It was also planned that CRD staff would be employed to install, program and commission the new SCADA. Other SCADA systems operated in the region are CRD Water Services department, Saanich Peninsula water and wastewater, Central Saanich, North Saanich, Sidney, Tsawout First Nation and a number of small systems on the Gulf islands.

Cost for the core area SCADA software replacement:

Software cost	$ 51,352
CRD staff time	85,000
Total cost	$136,352

Core Area SCADA Data Radios

In the core area, the SCADA system communicates over SCADA data radios. The current radios are on dedicated radio frequencies. We are experiencing problems with the radios being able to successfully communicate. The solution is to replace the SCADA radios with modern spread spectrum radios that are more robust and less vulnerable to interference.

Cost to replace the SCADA data radios:

Equipment cost	$ 98,300
CRD staff time	13,800
Total cost	$112,100

ALTERNATIVES

1. That the project be deferred to the 2007 budget process.

2. That the core area SCADA software and data radios be replaced, for a total project cost of $248,452, and that the project be funded from the priority equipment replacement funds in each of the trunk sewer systems.

FINANCIAL IMPLICATIONS

If the project was delayed and approved as part of the annual budgeting process, which would result in approval being granted in March 2007, the consequence would be additional staff time for operators called out after hours to respond to alarms resulting from the failure of the SCADA system to communicate with certain pump stations.

Cost Sharing

The core area sewer system consists of three sewer systems: the northwest trunk, the northeast trunk and the east coast interceptor. Each of the three trunk sewer systems would be charged a portion of the projects cost based on their percentage of the total number of SCADA stations they have. The funding for the two projects would be from the priority equipment replacement reserve funds that were established in each of the trunk sewers for projects such as these. Each of the priority equipment replacement funds has sufficient monies to fund the projects.

Project	Cost
SCADA software	$136,352
SCADA data radios	112,100
Total cost	$248,452

Trunk Sewer System	Percentage of Cost	Cost per Trunk Sewer
Northwest trunk	59.1%	$147,277
Northeast trunk	4.5%	11,214
East coast interceptor	36.1%	89,961

SUMMARY/CONCLUSIONS

The SCADA software and the SCADA data radios have reached the end of their useful life and should be replaced. Funds are established in each of the trunk sewer system's equipment replacement funds to replace the SCADA system when required.

RECOMMENDATION

That the core area supervisory, control and data acquisition software and data radios be replaced, for a total project cost of $248,452, and that the project be funded from the priority equipment replacement funds in each of the trunk sewer systems.

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COMMENTS

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