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**16TH AVENUE TRUNK SEWER, PHASE 2 CONSTRUCTION CONTRACT
TOWN OF MARKHAM, PROJECT 74030**

(Regional Council at its meeting on January 22, 2004, amended the foregoing Clause as follows:)

Recommendation 4 be referred back to the Transportation and Works Committee to allow the residents of Jennings Gate to make representation to the Committee.)

The Transportation and Works Committee recommends that:

- 1. The presentation from Paul Jankowski, Director of Infrastructure, Design and Construction be received;**
- 2. The recommendations contained in the following report, December 18, 2003, from the Commissioner of Transportation and Works be adopted:**

1. RECOMMENDATIONS

It is recommended that:

1. The following report be received for information by Committee and Regional Council.
2. That staff report back to Committee in February 2004 with an update on the environmental approvals process and other project details.
3. That staff report back to Committee in February 2004 on the impact of project delays on development planning and approvals.
4. Regional Council approve a financial contribution of \$147,000 to the Jennings Gate Estates Municipal Water System Project, subject to the Region receiving the necessary approval from the Ministry of the Environment (MOE) and executing a contract for Phase 2 construction with McNally/Aecon..

2. PURPOSE

This report provides an update on the 16th Avenue Trunk Sewer project, including commitments made to the Town of Markham and approval agencies. A project cost update and the servicing implications associated with the project are also provided.

3. BACKGROUND

There are three phases to the Ninth Line and 16th Avenue Trunk Sewer Project (*see Attachment 1*). These are:

1. Ninth Line Trunk Sewer, from Box Grove to south of Major Mackenzie Drive.
2. 16th Avenue Trunk Sewer, Phase 1, from Ninth Line to Stone Mason Boulevard.
3. 16th Avenue Trunk Sewer, Phase 2, from Stone Mason Boulevard to Woodbine Avenue.

The need for this sewer was identified in the 1997 York Durham Sewage System (YDSS) Master Plan.

McNally/Aecon were the design builders for construction of the Ninth Line Trunk Sewer from the existing YDSS to 16th Avenue and the 16th Avenue Sewer, Phase 1, from Ninth Line to Stone Mason Boulevard (Phase 1). The Ninth Line Sewer was completed in December 2002, and is in service. The construction of the 16th Avenue Phase 1 sewer is ongoing with total completion scheduled by the end of February 2004.

The 16th Avenue Trunk Sewer, Phase 2 is in the preliminary engineering and environmental approval phase. Regional Council has approved the execution of a contract with McNally/Aecon for Phase 2 of the project, when key environmental approvals have been secured from the (MOE) and the Toronto Region Conservation Authority (TRCA).

3.1 Servicing Needs

The 16th Avenue Trunk Sewer provides for short term (2007) and in conjunction with other Region trunk sewer projects for longer-term (up to 2035) sewage capacity for development in York Region.

Near term growth in communities such as Richmond Hill, Markham, and Vaughan, is dependent on the 16th Avenue Phase 2 Trunk Sewer. In some cases such as growth in Aurora/Newmarket, the dependency is through integrated works such as the Leslie Street Extension Trunk Sewer and the 19th Avenue Interceptor Trunk Sewer.

Phase 2 of the 16th Avenue Trunk Sewer is essential to servicing the near term needs of development in York Region. Hydraulic modelling conducted as part of the YDSS Master Plan revealed that without the 16th Avenue Trunk Sewer, and under storm conditions, surcharging of the system from the terminus at Box Grove up to Richmond Hill would occur.

3.2 The Phase 2 Design-Build Contract

The intention to negotiate with McNally/Aecon was originally identified in an April 12, 2001 report to Council that stated that the potential continuation of the tunnelling operation to complete Phase 2 would result in significant cost and time savings to the Region. This would be as a result of among other reasons, eliminating re-tendering, demobilization and remobilization. With Phase 1 scheduled for completion in February

2004, planning activities for Phase 2 could start immediately in order for the Region to reserve the option of potentially extending the Phase 1 contract to include Phase 2.

Following this report, staff negotiated the cost of extending the contract to include Phase 2 with McNally/Aecon. A subsequent report to Council dated June 27, 2002 recommended that the Region award a design-build contract to McNally/Aecon Civil Joint Venture in the negotiated amount of \$46,740,535, plus GST subject to the negotiation of acceptable contract terms and the execution of the contract.

3.3 Status of Phase 2 Contract

Following Council approval to award the Phase 2 contract to McNally, Region staff initiated the process to develop the contract documents (the terms and conditions).

The basis of the negotiated price of the Phase 2 contract was the contract terms and conditions of the Ninth line and Phase 1 contract (the “original conditions”). The design-builder was responsible to obtain the permits for the Town of Markham Noise By-Law (to permit a two shift tunnelling operation) and the Region was responsible for the Permit To Take Water (PTTW) from the MOE.

In the fall of 2002 and early 2003, the Region and the design-builder worked with the Town of Markham to secure approval for the Noise By-Law Exemption. Conditions requested by the Town for issuance of the Exemption included modifications to the Well Interference Program including an enhanced mitigation process with proactive mitigation for the Phase 2 project. Details of the Proactive Mitigation Program have been reviewed by Town staff and the Town’s hydrogeologist. A final report has been submitted in December 2003 with details communicated to the public through the Community Liaison Committee and a planned public meeting in early 2004.

In June 2002, the Region engaged MacViro Consultants Inc. to obtain the MOE Permit To Take Water to allow dewatering to be undertaken on the Phase 2 contract. The MOE responded to concerns from both the public and the Town of Markham with respect to the mitigation of well interference complaints on the Phase 1 contract by requesting the Region undertake to resolve concerns identified prior to the MOE issuing the Permit To Take Water. These concerns led to the establishment of the enhanced mitigation program for the 16th Avenue Trunk Sewer for both Phase 1 and Phase 2. These enhancements protocols include:

- An independent hydrogeologist checking the assessments made by the contractor.
- A 24 hour Region call center to register complaints or concerns.
- Establishing a Complaint Review Committee (CRC) to hear residents when they were dissatisfied with the decision of the Region’s independent hydrogeologist.
- Establishing a Community Liaison Committee (CLC) to foster and maintain public and stakeholder communications.
- Enhanced water and well monitoring program with concurrence by the Town staff and Town’s hydrogeologist.

- Proactive mitigation of impacts prior to their occurrence so that permanent solutions can be put in place prior to impacts from dewatering reviewed by the Town staff and Town's hydrogeologist.
- Permanent solutions where the impact is greater than three to four months.
- Regional assumption of monitoring and mitigation responsibilities including an initial allocation of \$5,000,000 towards funding these responsibilities.

At this date, the Region has not executed the contract and as reported has negotiated terms to account for recent developments including the Regional assumption of monitoring and mitigation, the delay in acquiring the Permit to Take Water, and the additional capital projects required to satisfy the regulatory agency requirements.

A condition to obtain the Permit To Take Water stipulated by the MOE was the approval of the proposed dewatering and discharge by the TRCA, the Department of Fisheries and Oceans (DFO), and the Ministry of Natural resources (MNR). Major concerns identified by the agencies are the effects of dewatering on groundwater recharge of streams and wetlands, erosion of streams from discharge, and temperature impacts of the discharge on cool or warm water fisheries.

The Region's consultant MacViro has expanded the project team to include geomorphologists, biologists and terrestrial scientists in order to properly assess the concerns and identify mitigation and monitoring measures of the natural features. This work has included extensive additional studies and a commitment from the Region to implement an environmental management plan that includes mitigation measures with significant capital costs. In November 2003, a meeting was held with senior management of the agencies to present the study findings to date with the goal of obtaining concurrence with the environmental management plan and hence approval in principle for the permits. The agencies provided some endorsement of the Region's proposed plans but requested additional submissions for their review. A final submission will be provided to the agencies. The proposed environmental management plan will result in increased project costs.

It should be noted that environmentalist advocacy groups such as "Friends of the Rouge" have expressed written concerns over this and other Regional Trunk Sewer projects and have called for a federal environmental assessment of these projects.

It is not possible to predict if and when the agencies will accept the environmental management plan proposed by MacViro consultants. Accordingly, it is not appropriate to execute the contract for the Phase 2 trunk sewer at this time.

3.4 Project Justification and Alternatives

The 1997 Master Plan identified a new parallel system for the northern and eastern areas of York Region. The 16th Avenue Trunk Sewer is an integral part of this servicing solution. The 16th Avenue Trunk Sewer is required to:

- Provide sewage service to the local development in Markham north of 16th Avenue.

- Convey the sewage from the central areas of the Region via the Leslie Collector to the Ninth Line Trunk.

To amend the approved May 1996 Consolidated Class Environmental Assessment for Sewer and Water Servicing for New Development prepared by the Town of Markham, an addendum was prepared by York Region to modify the approved May 1996 Class EA by the Town of Markham incorporating the Town's proposed local sewers along 16th Ave and Ninth Line into an overall Regional servicing solution.

The Class EA for Phase 2 sewer was a continuation of the previously approved activities detailed in the environmental assessments for the Ninth line and 16th Avenue Trunk Sewer project. It documented the planning process and environmental implications of Phase 2 of the 16th Avenue Trunk Sewer.

3.5 Property Issues

The contract for Phase 2 requires temporary property easements for contractor working sites. Easement agreements have been finalized for the two sites that are required immediately at the start of the project. These property easement agreements have been finalized and adopted by Council. The easement expires in August 2006. Depending on the timing of construction an extension may be required.

Other property will be required after the contract for Phase 2 has been awarded including the connection point to the existing sewer at Woodbine Avenue. This location is on a property belonging to the Town of Markham.

3.6 Proactive Mitigation

As part of the commitments made to the Town of Markham, the Region has developed a proactive mitigation program to identify impacts to private wells prior to the commencement of the dewatering operation. The analysis has been completed by the Region's hydrogeologist, Inspec-Sol CRA and presented to the Town staff and the Town's hydrogeologist for review and concurrence. This was obtained in principle at the draft stage and a final report was submitted to the Town of Markham.

The proactive mitigation program is based on an analysis undertaken using the expected drawdown of water levels from the dewatering and well water levels and well depths of every individual well in the area. Background well information was obtained from MOE well records and from well surveys conducted throughout the area.

A summary of the predicted impacts by location is as follows:

Table 1
Predicted Well Impacts

Location	Number of Wells Impacted
Cachet Estates	43
Jennings Gate	3
Victoria Square	0
Rural Areas	38
Heavy Water Users	4
Total	88

In addition to the proactive mitigation, the Region will maintain a commitment to its reactive mitigation program including the 24 hour call center and investigation, Complaint Review Committee (CRC) and Community Liaison Committee (CLC).

Mitigation options for the anticipated well interference in the Cachet Estates and Jennings Gate area includes the possibility of extending a local watermain service into this area. An alternative to providing conventional mitigation to these areas is a financial contribution by the Region equivalent to the estimated cost of providing mitigation to the private wells in these areas. Financial aspects of this alternative would depend on the timing of the Town servicing projects and the residual obligations of the Region. In November, 2003 the Town of Markham awarded the contract for the Jennings Gate Estates Municipal Water System.

Implementation of the planned proactive actions of the enhanced mitigation program has not been completed. Implementation would begin after all the regulatory approvals and permits have been secured for the project.

4. ANALYSIS AND OPTIONS

4.1 Review of Intent to Proceed and Options

On May 22, 2003, Regional staff reported to Regional Council that despite the current difficulties with the permitting process and associated delays to the project, the recommended approach was to negotiate a contract with McNally/Aecon subject to suitable contract conditions and obtaining a Permit to Take Water as approved by Regional Council in June 2002. After more than six months of protracted discussions with the agencies, there is continued uncertainty with respect to the necessary permits. The Region has negotiated with the contractor to retain the tunnel boring machine (TBM) and have the equipment available to commence Phase 2 of the sewer when the permits are obtained.

As previously reported to Regional Council, the costs include maintenance of the Phase 1 dewatering system at \$1500 per day. Retaining the TBM equipment and remobilizing at a later date to continue with the contract would cost an additional \$600,000. These costs have been added to the Phase 1 contract through a Council approved processes.

The implications of the delay in award and commencement of the contract are discussed in the following sections.

4.1.1 Schedule Implications

The delay in acquiring the PTTW has resulted in a delay to the project start. Once the PTTW is obtained, the contractor will install new dewatering wells and commence lowering of the groundwater table. The duration of this work is estimated at between four and six months. This would result in an equivalent delay in tunnel construction. The total project duration is approximately 36 months.

Staff are currently assessing the impact of the project delays on development planning and approvals. It will be necessary to review the timing of new development after a comprehensive evaluation of the existing sewer capacity, timing of anticipated development and timing of the trunk sewer has been carried out.

4.2 Strategies for Completing Phase 1 and Delaying Phase 2 Contract Execution

Phase 1 and Phase 2 are interdependent segments of the same tunnel and sewer construction project. A strategy to allow completion of Phase 1 that allowed Phase 2 to continue was required. Of the alternatives presented to Council on May 22, 2003, the adopted approach was to advance the tunnel boring machine forward beyond the last Phase 1 shaft location and permit completion of the Phase 1 sewer.

This option effectively allowed the Region additional time to secure the PTTW at minimal additional cost.

4.3 Jennings Gate Estates Municipal Water System

The Town of Markham is proceeding with the construction of the water system at a cost of \$928,602. In discussions between the Town and the Region, it was agreed that the Region would consider a financial contribution equivalent to the total cost of mitigation that would be borne by the Region. The financial contribution was calculated based on the proactive mitigation assessment and includes the mitigation actions and all the activities related to complaints response, independent hydrogeological investigations and the Complaints Review Committee.

The pro-active mitigation assessments determined that three private wells would be impacted with the Jennings Gate Estates. The cost of proactive mitigation associated with these three wells is estimated at \$48,000. In addition to this, estimated reactive cost associated with all elements of the response program including the 24-hour call centre,

complaint investigations, independent hydrogeological investigations and the CRC is estimated at \$99,000. The total estimated cost of providing mitigation and program response is estimated at \$147,000 including taxes.

As such, the installation of a Municipal Water System within Jennings Gate would result in a reduction of approximately \$147,000 to the overall cost of the mitigation program.

5. FINANCIAL IMPLICATIONS

As a result of the delay in the project, additional costs to the project as previously reported have been incurred as follows:

- Phase 1 Additional Costs:
 - \$50,000 to relay track to recommence tunnelling operation to allow for the completion of Phase 1 without commencing Phase 2.
 - \$1500 per day to defray dewatering costs from June 1, 2003.

Depending on permitting issues and the subsequent direction taken with respect to the execution of Phase 2 contract, the cost of the project will change for the following reasons:

- Potential remobilization costs of up to \$600,000. This amount was reduced in negotiations from \$1,500,000.
- Loss of early contract award reduction in the amounts of \$250,000.
- Additional costs of \$850,000 for engineering and studies related to PTTW issues.
- Additional cost for mitigation of impacts to natural features currently estimated at \$5 million.
- Additional cost for monitoring and mitigation of well impacts with Regional commitment of up to \$5 million for initial requirements.
- Reporting dewatering activities to regulatory authorities, monitoring well water levels and management of information from October 31, 2003 for three years by Region's hydrogeologist at an estimated of \$522,000.
- Omission of the mitigation from the design-builder's scope of services reducing the value of the design-build contract by \$1 million.

The total project costs, including the additional costs noted above will be funded from development charges (80%) and wastewater user rates (20%).

6. LOCAL MUNICIPAL IMPACT

The 16th Avenue Trunk Sewer and associated integrated components form an integral link to the continued development of The Regional Municipality of York in both the short and long term.

In the short term, the 16th Avenue Phase 1 Trunk Sewer is necessary to accommodate planned growth in the Town of Markham. Near term growth in communities such as Richmond Hill, Markham, and Vaughan, are also dependent on the 16th Avenue Phase 2

Trunk Sewer. In the longer term full build out of development in Vaughan, Stouffville, King, East Gwillimbury, Newmarket, Aurora, Richmond Hill, and Markham may be impacted by delays in the 16th Avenue Phase 2 Trunk Sewer. Staff will assess the impact and report back to Council in March 2004.

The recommended strategy of continuing with a renegotiated Phase 2 contract as reported on May 22, 2003 is still the recommended option and has the best opportunity to ensure minimal impact to this planned growth.

7. CONCLUSION

Executing a contract with McNally/Aecon would provide the shortest time of completion of the contract. The contract would be executed after all regulatory permits and approvals have been received.

For the Phase 2 Project, a Proactive Mitigation Program has been developed to address impacts to private wells. The proactive program would be implemented prior to the occurrence of the impacts. The program would be implemented after all regulatory approvals are secured and a contract McNally/Aecon has been executed.

With respect the Jennings Gate Estates, if municipal servicing was not in place, the estimated cost of mitigation would have been \$147,000. As the Town of Markham is proceeding with the municipal servicing for Jennings Gate Estates, this would result in direct savings to the Region with respect to the anticipated mitigation costs. As such, it is proposed that the Region make a contribution of \$147,000 toward the municipal servicing project undertaken by the Town of Markham.

The Senior Management Group has reviewed this report.

(A copy of the attachment referred to in the foregoing is included with this report and is also on file in the Office of the Regional Clerk.)