

NO: R075

COUNCIL DATE: April 14, 2003

REGULAR COUNCIL

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ТО:	Mayor & Council	DATE:	April 9, 2003
FROM:	General Manager, Engineering	FILE:	4802-910
SUBJECT:	Upgrade of the Chantrell Creek Crossing of Crescent Road		

RECOMMENDATION

That Council endorse Option 3 (box culvert installation) as the recommended culvert upgrading plan for the Chantrell Creek Crescent Road crossing, subject to the City receiving proper fisheries habitat credits.

BACKGROUND

Chantrell Creek is one of the few creeks in Surrey which has free flow to the Nicomekl River system and that has good fisheries habitat. Considerable fisheries related stream enhancements works have been undertaken in the upper portions of this watershed. While adequate for conveying storm flows, the culverts under Crescent Road, which were constructed many years ago, are difficult for fish to pass through. It is estimated that the existing concrete culverts will not need replacement for the next 15 to 20 years.

In 2001, the City began investigating the possibilities of fish passage enhancements for the Crescent Road crossing. Detailed analysis showed that baffles could not be installed in the existing culvert as too much flow capacity would be lost, limiting storm flows and possibly causing overtopping of the road. To allow for the reduced capacity caused by the baffles, an additional culvert could be added to the existing culvert to maintain flow capacity. Inlet and outlet pools for fish could also be provided. The work could be done by either open cut or by drilling under the road in order to maintain traffic flow during construction.

As stated above, the additional culvert would be solely needed to allow for improved fish passage which would thereby improve the habitat value of the creek (i.e., generate an environmental or fisheries "credit").

Typically the City needs to provide habitat compensation (i.e., use fisheries "credits") when affecting fish habitat through culvert extensions, erosion protection work, road widening, etc. The culvert installation has not proceeded to date as Fisheries and Oceans Canada has previously been unwilling to give the City fisheries credits for the proposed works, which could be banked against future needs.

However, recently some new instream erosion protection and other works requiring compensation have emerged, for which some of the fisheries credits would be needed. Final details are being worked out with DFO on the use of the credits for these works and the applicability of the banking of credits for use elsewhere in local area watersheds.

DISCUSSION

There are four options to create fish passage through a culvert under Crescent Road. Each option was evaluated for capacity, quality of the passage, cost of construction and disruption to traffic during construction. Following is a synopsis of each option:

1. *Parallel high flow culvert – open cut –* this option is to install a second culvert parallel to the existing one, providing high flow capacity for the system. Open cut would be the least expensive, but most disruptive to residents who use Crescent Road. Crescent Road would need a total closure for 2 days during construction. Baffles were to be installed in existing culvert with pools at either end. Estimated cost is \$50,000.

- 2. *Parallel high flow culvert directional drilled –* similar to the concept listed above; however, Crescent Road would be able to remain open during construction. Estimated cost is \$90,000.
- 3. *Box culvert installation* this option would see the replacement of the existing culvert with a concrete box culvert at a lower elevation and milder slope. The box culvert would be sized to allow for a natural creek bed in the bottom of the culvert. The installation of the box culvert will require the isolation of creek flows, and total closure of Crescent Road for a minimum of 4-5 days. Estimated cost is \$150,000.
- 4. *New bridge* this option is significantly more expensive than the others with minimal additional benefit for fish passage compared to the box culverts. Crescent Road would need total closure for 2 to 3 weeks. Estimated cost is \$500,000 to \$700,000.

CONCLUSION

At the present time, staff are recommending Option 3, should appropriate credits be granted by DFO, because it has the best benefit cost ratio for fish passage and long-term infrastructure replacement. However, it will require a complete closure of Crescent Road for at least 4-5 days. A temporary road detour route is proposed as shown in Figure 1. Construction will have to take place during the fisheries window between August 15 and September 15, with the preference for September after the peak use of the beach area is over.

Paul Ham, P.Eng. General Manager, Engineering

PH/VL/CAB/brb Attachment

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