



To: General Purposes Committee

Date: June 18, 2003

From: Steve Ono  
Director, Engineering

File: 6060-01

Re: Williams Road Sanitary Sewer and Storm Drainage Issues

**Staff Recommendation**

1. That the proposed drainage works identified under Option 2 of the report dated June 18, 2003 from the Director of Engineering be added to the drainage DCC program; and
2. That the proposed drainage works identified under Option 2 of the report dated June 18, 2003 from the Director of Engineering be referred for consideration by the Land and Capital Team for addition to the 2004 Capital Program; and
3. That processing of rezoning applications in the 10,000 and 11,000 block of Williams Road, the 10,000 block of Shell Road and the 10,000 block of No. 4 Road be deferred until the works identified in Option 2 of the report dated June 18, 2003 from the Director of Engineering are complete.

Steve Ono, P.Eng.  
Director, Engineering (L.4394)

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ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Development Applications .....	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	
Policy Planning .....	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	
Sewerage & Drainage.....	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	
Budgets .....	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	

## Staff Report

### Origin

At the Council meeting on March 25, 2002, by resolution no. R02/6-27, Council deferred processing of rezoning applications for the 10,000 and 11,000 blocks of Williams Road, the 10,000 block of Shell Road and the 10,000 block of No. 4 Road pending a staff report on sanitary sewer and storm drainage issues in the area.

### Analysis

Richmond's flat topography, and the influence of tides and the Fraser River make analysis of the sanitary sewer and drainage systems complex. However, recent efforts and advances in computer modelling, data collection and compilation into the Geographic Information System (GIS), have now enabled staff to analyse the sanitary sewer and drainage systems in the vicinity of the 10,000 and 11,000 blocks of Williams Road, the 10,000 block of Shell Road and the 10,000 block of No. 4 Road in response to the sewerage and drainage issues.

### Sanitary Sewer

There are two main sanitary sewer issues in this area:

- Historic sanitary sewer overflows from the Williams Road sanitary forcemain, and
- Concern over the gravity sewer capacity servicing individual properties in light of the proposed residential densification.

The sanitary sewer hydraulic model indicates that periodic high sewage levels in the GVS&DD system along Shell Road and Finn Road was the most likely cause of the Williams Road forcemain overflows. Since the Williams Road forcemain was redirected to the Edgemere pump station over two years ago, there has not been an overflow. Staff recommend continued operation of the Williams Road forcemain through the Edgemere pump station until the Williams Road forcemain reaches the end of its useful life in approximately 30 years.

The model was also used to estimate the capacity of the pipes in the area for a fully developed scenario. The model indicates that the existing sanitary sewer system has a large enough capacity to support the proposed subdivision of lots along the 10,000 and 11,000 blocks of Williams Road, the 10,000 block of Shell Road and the 10,000 block of No. 4 Road.

### Storm Drainage

The residents in the area are concerned that increased development will exacerbate flooding problems in the Williams Road area of the Horseshoe Slough Catchment.

A monitoring program was established in early 2002 to confirm water levels and pump station operation in the area. In addition, recently entered GIS data was used to develop a drainage hydraulic model to estimate the flows. Based on the monitoring and modelling results, the

Horseshoe Slough Flooding Mitigation Report (Kerr Wood Leidal Associates Ltd., June 2003) identified the most significant drainage issues in the area to be:

- low capacity at the Steveston-Shell Pump Station (hence elevated water level in the upstream residential area) and,
- low capacity in the area's storm sewer pipe network.

Five strategic scenarios to address the drainage issues in the area were reviewed. The scenario identified by the consultant and endorsed by staff is shown in Table 1. The proposed works identified in Table 1 would provide capacity to meet current City standards for draining the 10 year return storm, and are shown graphically in Schedule "A" attached to this report.

Item	Est. Time Frame	Estimated Cost
1. Confirm acceptability of low water levels in agricultural areas with local farmers & landowners and complete further detailed modeling	2003	\$0
2. Removal of Steveston-Shell Pump Station and lowering of Horseshoe Slough PS levels	2004	\$45,000
3. Installation of an irrigation gate & offline pump station at Steveston-Shell	2004	\$384,000
4. Area storm sewer pipe network upgrades	2004	\$3,416,000
<b>Total</b>		<b>\$3,845,000</b>

Table 1. Proposed Action/Works for Recommended Option

The pump station at Steveston-Shell was originally installed to improve drainage in the Williams Road area but also allows a higher water level (for irrigation) to be maintained in the agricultural area south of Steveston Highway, while providing adequate drainage upstream in the residential areas. Staff met with the Richmond Farmer's Institute (RFI) on June 3, 2003 and the RFI indicated that the higher water level for the agricultural area may not be necessary, however this would have to be confirmed through dialogue with farmers and landowners in the area. This dialogue would be completed in 2003, as shown in Table 1. If higher water levels are not required then the irrigation gate and pump station at Steveston-Shell (item 3) would not be specifically required.

As an interim measure, setting adjustments have been made to the Steveston-Shell Pump Station to attempt to keep water levels lower in the problem area.

Further modelling will be completed in 2003 to provide detailed design data and confirm current conclusions.

## Options

There are two options for addressing storm drainage issues in the 10,000 and 11,000 blocks of Williams Road, the 10,000 block of Shell Road and the 10,000 block of No. 4 Road.

### Option 1 – Status Quo

Continue to restrict the subdivision of the properties in the area, and do not undertake improvements to the drainage system for the area. While this area is known to have had drainage issues, this would eliminate the potential to exacerbate the situation as a result of new development.

Pros – No additional capital cost for drainage infrastructure. Also, elimination of new development in the area would eliminate the impact of new development on existing drainage system.

Cons – New development in the area would be stifled, and existing drainage system would not be improved.

### Option 2 – Implement the Identified Drainage Improvements (Recommended)

Implement the drainage improvements as outlined above. The recommended source of funding for the proposed works is drainage Development Cost Charges (DCC). The existing drainage DCC program is valued at approximately \$28 million and allows for improvements at the Steveston-Shell Pump Station. However, funding for the area storm drainage pipe network upgrades is not currently allocated in the DCC program and would have to be added as a new item.

If this option were chosen the construction work would be scheduled to begin in mid-2004 and targeted for completion in 2004. Staff would advise Council when the work is completed, at which time development could resume. If the works are completed by the end of 2004, development could resume in 2005.

Pros - Properties in the area could subdivide with no negative drainage impact to the area once the recommended drainage improvements are completed (estimated 2004), and the overall drainage system is improved.

Cons – Addition of the recommended drainage works to the DCC program would expand the DCC program and charges as follows:

- Residential from \$14,233.37 to \$14,332.41/unit, (\$99.04/unit increase)
- Commercial/Light Industrial from \$4,805.19 to \$5,653.82/acre, (\$848.63/acre increase)
- Major Industry from \$64,711.79 to \$65,560.42/acre, (\$848.63/acre increase)

### **Financial Impact**

There is no financial impact at this time.

### **Conclusion**

Sanitary sewer issues in the 10,000 and 11,000 blocks of Williams Road, the 10,000 block of Shell Road and the 10,000 block of No. 4 Road have been analysed using a sanitary sewer hydraulic model and it has been determined that continued operation of the Williams Road forcemain

through the Edgemere Pump Station will prevent further sanitary overflows. There is no additional capital cost associated with this continued operation.

Drainage monitoring and computer modelling has shown that removing or modifying the Steveston-Shell Pump Station, and implementing a local pipe network upgrade program around Williams Road and Shell Road, will alleviate drainage problems in the area and provide capacity for the 10-year design storm in the Horseshoe Slough Catchment. Implementation of these works can occur at an estimated cost of \$3,845,000, funded from the drainage DCC program.

Processing of rezoning applications should be deferred until the recommended drainage works have been completed.



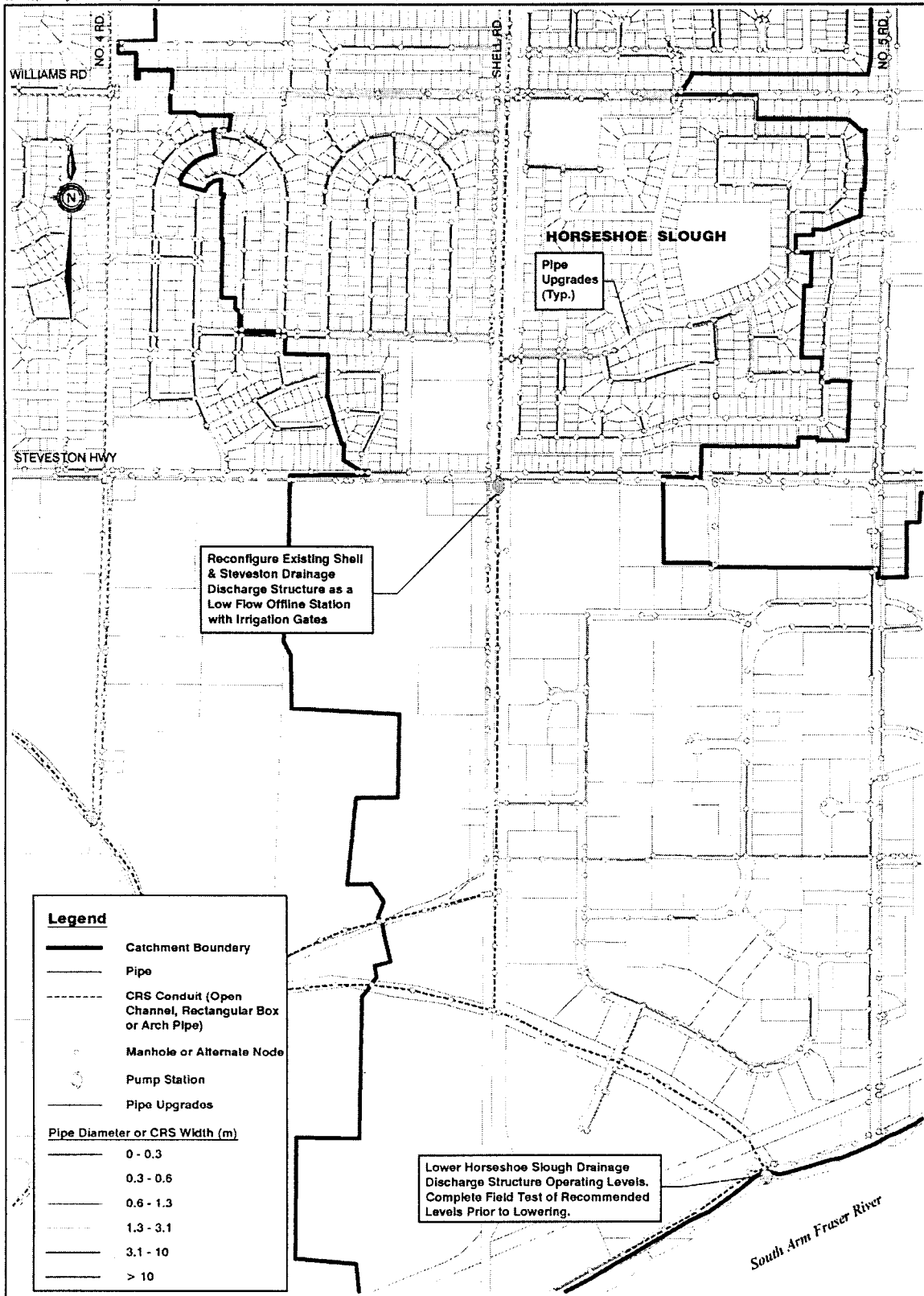
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Jl:ji

# SCHEDULE A

651-013 Drawings for show/651-013 of 7-1 DWC

Jun 2003



**Legend**

- Catchment Boundary
- Pipe
- CRS Conduit (Open Channel, Rectangular Box or Arch Pipe)
- Manhole or Alternate Node
- Pump Station
- Pipe Upgrades

**Pipe Diameter or CRS Width (m)**

- 0 - 0.3
- 0.3 - 0.6
- 0.6 - 1.3
- 1.3 - 3.1
- 3.1 - 10
- > 10

**KWL** KERR WOOD LEIDAL  
CONSULTING ENGINEERS

Project No. 651 013	Date June 2003
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150 0 150  
Scale in Metres

City of Richmond  
Horseshoe Slough Flooding Mitigation

## Horseshoe Slough Flooding Mitigation Strategy

**Figure 7-1**