APPLICATION FOR
ENVIRONMENTAL REVIEW:
Schoolhouse Creek Bank Stabilization,
Miller Park Ravine,
City of Coquitlam

Submitted to
Ministry of Air, Land and Water
Lower Mainland Region
10470-152 Street
Surrey, BC
V3R 0R3

25 June 2001

Submitted by
Dillon Consulting Limited
130-10691 Shellbridge Way
Richmond BC
V6X 2W8

Dillon file no. 01-9082-0200
June 25, 2001

Ministry of Air, Land and Water
Lower Mainland Region
10470-152 Street
Surrey, BC  V3R 0R3

Attention:  Ms. Ann Waskett-Myers
Referrals Officer

Dear Ann;

Re:  Application for Environmental Review -
Schoolhouse Creek, Miller Park Ravine, City of Coquitlam

Dillon Consulting Limited is pleased to submit four copies of an Application for Environmental Review for bank stabilization along Schoolhouse Creek in the Miller Park Ravine at 900 Marnac Avenue in Coquitlam. Schoolhouse Creek is a first-order stream that flows into Burrard Inlet. Dillon respectfully requests an early window approval for this project, starting on July 15th, 2001. This request is in order to accommodate the completion of the project by our summer students of the City’s TREAD Program (Trails, Environment, and Development Program), who are only with us until August 31. Subject to approval, the works would proceed on or around July 15, and end in late August, during the Fisheries Window.

This application has been prepared according to the guidelines provided by the BC Ministry of Environment, Lands and Parks in their circular entitled Streambank Stabilization - Instream Works Type No. 7.

Please feel free to contact me (278-7847) should you have any questions regarding the attached application.

Yours truly,

Dillon Consulting Limited

[Signature]

Senior Biologist

cc.  Ms. Kristine Kelly, Maintenance Supervisor, Parks and Open Spaces Services, City of Coquitlam.
APPLICATION FORM
NOTIFICATION OF A HABITAT OFFICER
Streambank Stabilization Works
In-Stream Works Type No. 7
Pursuant to Section 9 Regulation of the Water Act

1. Applicant Name: City of Coquitlam – Parks and Open Spaces Services
   Street Address: 2647 Austin Avenue
   City: Coquitlam, BC
   Postal Code: V3K 3S2
   Telephone: 933-6080
   Contact: Ms. Kristine Kelly
   Fax: 933-6256

2. Location of Works:
   Regional District: City/Municipality: City of Coquitlam
   Stream Name: Schoolhouse Creek
   Location on Stream: Miller Park Ravine
   What stream / river / lake does it flow into: Burrard Inlet
   Street address of pertinent property: 900 Marnac Avenue, Coquitlam, BC
   Complete legal description of all lands affected by the changes:

3. Agent(s) Name: Dillon Consulting Limited
   Street Address: 130, 10691 Shellbridge Way
   City: Richmond, BC
   Postal Code: V6X 2W8
   Telephone: 278-7847
   Contact: Paul Schaap
   Fax: 278-7894

4. Who is Monitoring the Work?: Dillon Consulting Limited
   Street Address: Same as above
   City:
   Postal Code:
   Telephone:
   Contact: Chris Dane
   Fax:

5. Who is Doing the Work?:
   Employees of Dillon Consulting’s TREAD Program (Trail, Environment and Development Program)
   Street Address: Same as above
   City:
   Postal Code:
   Telephone:
   Contact:
   Fax:

6. Proposed Timing:
   Start (day/month/year): early June 15, 2001 (request an early window)
   Finish (day/month/year): early September 15, 2001

7. Tenure to Land: ✓ Registered Owner ☐ Lessee
   □ Other (please specify)

THE GOVERNMENT OF BRITISH COLUMBIA IS AN "EMPLOYMENT EQUITY EMPLOYER"
8. Fish & Wildlife Restrictive Covenant on Property? □ Yes □ No

9. Written Justification for the proposed works including:
   □ Technical rationale from a qualified professional for the proposed bank stabilization.

10. Written clarification and clearly marked drawings of the proposed work design that demonstrate that the work has been designed to:
   □ Utilize “integrated” streambank stabilization techniques,
   □ Minimize disturbance of riparian vegetation,
   □ Minimize disturbance of the stream channel and floodplain, and
   □ Incorporate appropriate “habitat features”

11. Appropriate habitat compensation plans that are:
    □ Designed by a qualified environmental consultant,
    □ N/A (ultimately determined by Fisheries & Oceans Canada)

12. Maps
    □ Small Scale (approx. 1:20,000) Site Location Map (To illustrate the approximate location of the subject site). – See Photos and Figures attached.
    □ Detailed Large Scale (1:500) or larger) Map(s) of the site(s) indicating:
      □ Location of proposed works in relation to all watercourses within the property
      □ Location of proposed works in relation to the property lines;
      □ All watercourses, wetlands and/or wildlife habitats and direction of flow for watercourses; and
      □ Delineation of vegetation removal areas.

13. Photographs
    □ Detailed photographs of the site, taken from a variety of perspectives, appropriately marked to clearly display:
      □ The proposed works area including any vegetation to be disturbed.
      N/A □ The proposed area of compensation for habitat losses associated with the proposed works.

The information on this notification form will be made available to the public under the Freedom of Information legislation, if requested.

SIGNED: [Signature]
(Applicant/Agent)    DATE: 25 June 2001

For Office Use Only
Application Type: No. ______
1.0 PROJECT LOCATION AND DESCRIPTION OF PROPOSED WORKS

In conjunction with pedestrian trail improvements, the City of Coquitlam is proposing to undertake bank stabilization works on a reach of Schoolhouse Creek. The proposed works will occur within Miller Park, located in a residential area of the City between Miller, Oakview and Spence Streets (see Figure 1). The proposed work site is an area of bank erosion resulting from channel scour and overland flow. The overall goal of the proposed bank stabilization is to armour the Schoolhouse Creek bank by using an integrated (i.e., biological and engineering) approach in order to prevent further bank erosion into this fish-bearing watercourse. The proposed works will also enhance trail stability and thus pedestrian safety (see Photo 2).

As described in more detail later in this application, the proposed works involve the construction of a biogabion wall to provide long-term stability to the channel banks and trail. Live native plant material will be integrated into the “wall” and a riparian planting ledge at the top of the wall. The works are considered to fall under the Streambank Stabilization - Instream Works Type No. 7 category of the Ministry’s new application guidelines.

2.0 DESCRIPTION OF EXISTING CHARACTERISTICS OF THE STUDY AREA

Schoolhouse Creek is a first-order, perennial watercourse that generally flows in northeastern orientation into Burrard Inlet. The watercourse drains developed areas between the Stoney and Noble Creek drainage basins (see Figure 1). North of the Miller Park area, Schoolhouse Creek flows downslope into Port Moody, where it is partly piped before reaching Burrard Inlet. At the proposed work site the creek morphology is sinuous, and is deeply incised on either bank. Bottom substrates are composed of mostly cobbles and gravels, with some sand and silt. At the area of proposed works, the creek has a wetted width of approximately 1.5 m, a early summer depth of approximately 10-15 cm, and bank slopes of approximately 1:1. This watercourse has undergone no previous engineered channelization, with the exception of some log cribbing that is currently in place under 3 small pedestrian bridges within the ravine (Photo 1 depicts East Bridge).

The proposed work site is located on an outer meander bend where toe erosion has occurred. Erosion has also been exacerbated by overland flow down the steep ravine banks (see Photo 1). Riparian vegetation along Schoolhouse Creek is well established and extensive. Soil substrates are comprised mainly of loamy sand. Plants such as salmonberry, Indian plum and skunk cabbage predominate in this boggy area (see Photo 3). The ravine area provides wildlife habitat for various birds, mammals and herpetiles, as well as erosion control and filtration functions.

Exact fisheries values of this reach of Schoolhouse Creek are unknown. The lower reaches of Schoolhouse Creek are known to be fish-bearing, however a steep elevation transition located downstream of Miller Park is expected to preclude fish passage. For the purposes of the application, however, it is assumed that resident and/or anadromous salmonids may be present and all proper mitigation will take place as a result.

There is currently a pedestrian walking trail that is set back several metres from the south bank of Schoolhouse Creek (see Photo 1). The Miller Park trail system is actively utilized by students who walk to and from Banting Middle School and Miller Park Elementary, as well as numerous other users who enjoy the wilderness trail for its flora and fauna. The City is undertaking trail improvements including the replacement of a section of boardwalk. The boardwalk construction will occur in conjunction with the

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construction of the biogabions. There is also a pedestrian bridge, known as East Bridge, at the site of the proposed works (see Photo 1). The proposed trail improvement activities have already been authorized under BC MoELP File No. 76910060/2813. The boardwalk and proposed bank stabilization projects are part of a 3-year trail improvement program that is planned by the City of Coquitlam. This application is for the bank stabilization component of the project only.

3.0 PROPOSED PROJECT WORKS

The overall goals of the proposed improvements are to stabilize the Schoolhouse Creek bank, to reduce future erosion potential, and to provide a proper support for the boardwalk. The proposed works are identified as a Schedule 2 project (i.e., no loss of habitat will occur). Please refer to Figures 2 and 3 for a depiction of the proposed works.

The proposed work involves the building of a biogabion wall, which uses an integrated technique of "hard" engineering and "soft" bioengineering. All work will be conducted by hand, and there will be no large machinery used, such as excavators and bulldozers. It is proposed that the work be done by students employed by the City of Coquitlam's TREAD (Trail, Restoration, Environment and Development Program) student summer works program. The work would be carried out in conjunction with the building of a boardwalk, for which TREAD will also supply the labor.

TREAD employees will construct the biogabion wall by hand, and will use existing trails to bring in rock and soil via wheelbarrow. Students will then plant the biogabion with live willow stakes. The top of the biogabions will have a planting ledge (see Figure 3) that will be planted with typical riparian plants of the area such as salmonberry and Indian plum.

The biogabion wall measures 15 metres in length and will be 1 metre wide by 1.5 m high (see Figures 2 and 3). The proposed wall will be set as far into the bank so as to minimize any reduction of high-flow cross sectional area of the stream. The existing East Bridge will pass directly over the proposed biogabion wall. Footer rocks will be placed along the toe of the wall to provide scour protection and enhance low flow fish habitat quality. An existing log will be attached to the toe of the lower gabion also to enhance habitat quality. At either extremity of the length of the wall, large rock will be placed for increased stability.

4.0 POTENTIAL IMPACTS TO FISH/FISH HABITAT AND TERRESTRIAL HABITAT

Permanent impacts to fish habitat will be avoided. It is anticipated that the fisheries value of the watercourse will be improved by the proposed plantings. Further, sediment originating from the site will be greatly reduced. It is not expected that terrestrial habitat along the north or south side of the creek will be affected by the proposed works. The north side vegetation will not be disturbed, and the south bank will be planted.

Potential impacts of in-stream works include:

- possible construction-related siltation and sedimentation which could result in a decrease of water quality and subsequent direct and indirect impacts to fish and other aquatic organisms; and
- loss of terrestrial habitat along the new creek alignment, although in this case, terrestrial habitat loss is not likely.
The site is easily accessed via the eastern-most end of Miller Avenue (See Figure 1). Access to homes or businesses will not be affected. There may be some disruption of the walking trail adjacent to Schoolhouse Creek due to construction of the boardwalk and biogabion wall, however these impacts will be temporary.

5.0 PROPOSED MITIGATION STRATEGY

All construction will be conducted from the south bank. There will be no machinery involved with the exception of a small, gas powered pump. Standard construction techniques will be employed so as to minimize construction and operation impacts to the water and land-based environmental values of the area. The TREAD student team will be fully supervised by Dillon professionals and City of Coquitlam staff.

Clearing

There may be some clearing of the bank required in order to lay the biogabion and associated footer rock, however these losses are expected to be minimal. All organic debris will be removed from the site.

Channel Excavation

There will be no channel excavation.

Bank Stabilization

All areas disturbed during construction will be replanted with species typical of the local area (e.g., salmonberry or Indian Plum). The biogabion will be constructed in two layers (see Figure 3) to achieve the steep slope required (i.e., 1H:1V). The lower gabion will be filled with 100 mm-150 mm rock in order to maximize stability. Footer rocks will be placed along the toe of the gabions to further increase stability. Large rocks will be placed at either extremity of the biogabion wall. It is only the upper gabion that will be filled with a mixture of 100mm-150mm rock mixed with 40% soil, and planted. An existing log will be attached to the footer rock at the toe of the lower biogabion.

Work Site Isolation

All work will be conducted in the dry. This will be achieved by isolating the site using sand bags or some other form of barrier. Water will be re-routed around the work site through a 12-inch PVC flume. Appropriate sediment control measures will be employed (e.g., rip rap splash pad and flume outlet).

Equipment Maintenance

A standard 2" gas-powered Wajax pump may be used to pump out the isolated work site. Any refueling will take place well outside the work area, and appropriate spill containment and cleanup materials will be on hand should an unexpected release occur.

Fish

A qualified environmental professional will complete a fish salvage in the isolated work cell before
construction activities commence. This will be done to ensure that no fish are trapped in the work area, or harmed by the proposed works. Stranded fish will be captured and safely released well downstream of the work site. Results of the fish salvage, if any, will be forwarded to the Ministry as per standard protocols of environmental monitoring.

Use of Concrete

There will be no concrete poured in place during construction. Several precast cement blocks will be laid to act as a footer to the boardwalk supports (see Figure 3).

Landscape Restoration and Enhancement Opportunities

Once the biogabion wall has been constructed, it will be planted with live willow stakes. Furthermore, the top of the biogabions will have a ledge (see Figure 3) that will be planted with typical riparian plants of the area such as salmonberry and Indian Plum. This vegetation will be visible to those people using the boardwalk. If necessary, the adjacent bank will be replanted using a mix of native woody plants and herbaceous material. Disturbed areas on the south bank will be seeded and planted to establish a vegetated buffer along the full length of the creek in areas affected by the proposed works. As described above, this will include live staking and planting of nursery stock. Spacing of individual plants will be approximately one metre. It is expected that the proposed plantings will at least maintain, and most likely enhance fish habitat value.

6.0 ENVIRONMENTAL INSPECTION AND MONITORING COMMITMENTS

A qualified Environmental Monitor from Dillon Consulting will be onsite during the instream component of the work. The Monitor will work with the construction crew to ensure all environmental protection measures are strictly adhered to, and that work site isolation techniques are functioning as desired. The Monitor will also provide on-site direction and guidance regarding aspects of the construction works which potentially affect the watercourse, and will have written the authority to halt work at any time that he/she feels that the proper environmental guidelines and mitigation is not being followed. The TREAD students will also be supervised by a City of Coquitlam employee, and as well the students will receive adequate supervision from Dillon staff so as to ensure quality work.

7.0 PROJECT SCHEDULE

It is expected that the majority of the proposed works at Schoolhouse Creek will be completed during the Fisheries Window of August 1 to September 15, 2001. However, we would respectfully request a start date of July 15 in order to ensure completion by the end of the August, coinciding with the end of the TREAD program. Construction will be timed to coincide with favourable weather conditions within the low flow period of the fisheries window. Should flows increase substantially due to rainfall events, construction activities will be halted until lower flows prevail. In general the principal goal of all activities will be to minimize disturbance to channel and minimize the introduction of sediment into the channel.

8.0 CONCLUSIONS

The proposed works along Schoolhouse Creek will increase bank stability, minimize erosion potential and
sediment generation, increase the safety of the planned boardwalk, and improve fish habitat through the establishment of a more robust vegetative buffer zone. It is expected the proposed works will not result in the net loss of fish habitat, and will actually result in a net gain.
Photo 1. Looking west at the study area (Schoolhouse Creek, Boardwalk and Pedestrian Bridge)

Photo 2. Photo showing eroded sections of the existing pathway along the top-of-bank at the area of concern.

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Photo 3. Looking at the eroded southern bank and representative habitats in the vicinity.