

TABLE 1 – SECP BMPs for low risk crossings

CONSTRUCTION						
TECHNIQUE	LEGEND	REF.	OBJECTIVES	BMP	LOCATION	TIMING OF INSTALLATION
LIMIT SITE DISTURBANCE		1	Protect soil from unnecessary disturbance which creates potential for erosion processes.	No grubbing outside of the road prism. When clearing within the road right-of-way adjacent to the watercourse, cut off (prune back) vegetation leaving root mass intact in soil. Vegetation promotes rainfall interception and infiltration. It also provides watercourse shading and nutrients to the aquatic environment. Store equipment and building materials away from existing vegetation where possible.	Within the Riparian Management Area of the watercourse.	During road construction and culvert installation procedures.
		2	As much as possible, avoid working in areas of ponded water or saturated soils.	These seasonally wet areas require extra precautions to protect soils and vegetation. If CMPs are required in these locations, overland fill/log corduroy may be required to access the crossing in order to complete the installation.	Any wet ground encountered immediately adjacent to the watercourse.	Ground protection measures must be in place prior to accessing the construction site.
CMP INSTALLATION		3	Minimize construction footprint and disturbance to existing watercourse.	Only excavate in the immediate area of the CMP installation. A smaller footprint requires less sediment and erosion control measures after installation. No unprotected fording of the watercourse is permitted.	The CMP will be installed centred on the existing watercourse and should not substantially change the natural flow pattern.	During planning and site preparation for the CMP installation.
		4	Allow installation to proceed under isolated conditions.	Isolate construction site by installation of temporary sediment sumps/active pumping of sediment-laden waters. Should significant flows be encountered, water may have to be diverted around the site. Temporary sediment sumps function to collect and settle mobilized sediments. Water from these sumps can be temporarily diverted down existing ditch lines or actively pumped from the construction site into adjacent upland areas for natural filtration.	Ideally, the sump location would be directly upstream of crossing location. Should this not be feasible, a secondary sump location would be immediately below the crossing.	The sumps must be installed prior to excavation in preparation for installation of the CMP. Pumping should occur whilst installation is occurring.
		5	Prevent detrimental impacts associated with increased sediment loads on downstream waters.	Install in-stream silt curtains (if site isolation stated above cannot be implemented). In-stream silt curtains only function in low volume, slow moving waters. They may be constructed using non-woven geotextile draped over logs and weighted with boulders to the channel bottom. Silt curtains are used in series (typically 2-3) to filter suspended sediments.	Install immediately downstream of work site where suspended sediment loads are greatest.	Prior to CMP bed preparation.
		6	Protect against future scour and erosion of the structure which leads to piping, undermining and eventual road failure.	Excavate unsuitable materials beneath the CMP and replace with suitably compacted fill to provide erosion resistant foundation. Also, install collar seepage barriers where necessary.	Beneath location where CMP will be installed.	Prior to placement of the CMP.
		7	Avoid blocking the inlet and outlet of CMPs which may be caused by encroachment of eroding road embankment fill.	Ensure CMP length is of sufficient length to protrude past end fills and scour protection measures.	Both the inlet and outlet of the CMP.	During initial planning and also ground truthing during installation.
		8	Protect unstable or erodible fill at CMP outlet and inlet with rock aprons to prevent scour and erosion.	Install erosion-resistant materials at the inlet and outlet of the CMP.	Immediately adjacent to the inlet and outlet of the CMP.	Immediately upon completing the installation of the CMP.
DRAINAGE MANAGEMENT		9	Divert ditch flow to a location where it can be discharged away from the watercourse.	If possible, install cross drain culverts or trenches to divert ditch water to the side of the approach with the most intact vegetation buffer between the watercourse and the ditch termination. Protect erodible fill slopes from cross drain discharges with flumes or other erosion-resistant material.	Where terrain allows, and as close to the watercourse as possible, while still diverting flows away from the watercourse.	As soon as ditches are constructed.
		10	Divert ditch flow to a location where it can be discharged away from the watercourse.	Construct non-erodible ditch blocks at cross drains and wing ditches as required.	At all cross drain and wing ditch inlets.	As soon as ditches are constructed.
		11	Divert ditch water out of ditches, away from the watercourse and across vegetated forest floor to allow natural filtration.	Construct wing ditches to disconnect all ditch lines from the watercourse.	Both approaches to the crossing as terrain allows.	As soon as ditches are constructed.
		12	Prevent rill/gully formation and prevent direct flow into the watercourse.	Crown road approaches so that surface flow drains off to the side of the road and not directly into the watercourse.	Road grade immediately adjacent to the watercourse.	At project completion.
EROSION CONTROL		13	Increase the slope length to decrease the erosion potential.	Construct stable cut and fill slopes, at designed angles. Consider terracing steep cut slopes. Slopes should be constructed based on soils, aspect, moisture content and climatic conditions.	Any cut or fill slope immediately adjacent to the CMP crossing which has the potential to deliver sediment-laden runoff to the watercourse.	Throughout road approach construction.
		14	Temporarily reduce rain splash erosion while the site is exposed during construction.	Temporarily cover exposed soils if heavy rainfall is encountered. Tarps, geotextile, hay or logging slash may be utilized.	Any exposed soils that may erode and be carried towards the watercourse.	If heavy rainfall is encountered during construction or anticipated overnight.
		15	Provide seeding catchment areas to aid in germination/infiltration.	Surface roughening on all cutslopes and fill slopes. Do not backblade when finishing slopes. Seed and mulch all exposed soils.	All exposed soils in ditches and slopes immediately adjacent to the site.	During final site contouring and after slopes are finished to grade.
		16	Move waste to a stable location where it cannot erode and enter the watercourse.	Endhaul debris/waste immediately adjacent to the site. Seed and mulch all waste sites.	All spoil materials within the riparian management zone.	Prior to completion of the project.
SEDIMENT CONTROL		17	Provide areas for sediment deposition prior to flowing into the watercourse.	Construct settling basins as required. (note: these structures require periodic maintenance).	Install 5-10m back from the watercourse edge in any ditch that directly flows into the watercourse.	As soon as ditch lines are constructed.
		18	Slow the flow of runoff water and aid in sediment deposition prior to entering the watercourse.	Install silt fences as required. (note: these structures require periodic maintenance).	At the discretion of the contractor on all disturbed soils within close proximity to the watercourse.	Throughout project as soils are exposed and at project completion.

STANDARD SEDIMENT AND EROSION CONTROL PLAN (SECP) FOR LOW RISK STREAM CROSSING CULVERT CONSTRUCTION

1.0 Objectives
The primary objective of this SECP is to provide a generic plan for **low risk** watercourse crossing culvert construction projects. Sediment delivery into the aquatic environment and associated downstream reaches will be minimized during culvert installation and operation by; (1) minimizing site disturbance, (2) drainage management, (3) erosion control, and (4) sediment control (in descending priority). Low risk culvert installations are typically **crossings of non-fish bearing streams and substantial Non-Classifiable Drainages (NCDs) which are not directly connected to fish-bearing waters.**

2.0 Critical Areas
Critical areas relating to the project include; all ditch lines which drain towards the watercourse, areas of excavation, existing riparian vegetation, and the reach immediately downstream of the crossing location.

3.0 Timing
All construction will proceed in appropriate weather conditions. Although no specified timing window exists for culvert installations on non-fish bearing watercourses, it is recommended that works be carried out during low flows. Culverts must be installed as each crossing is encountered during road construction. Once commenced, all works will proceed to completion as soon as practicable.

4.0 Accountability
It is the responsibility of the contractor to ensure that this SECP, in conjunction with the *BC Timber Sales Prince George Business Area Environmental Management System*, are followed in their entirety.

Should an emergency occur (i.e. significant sediment release into the aquatic environment due to construction of forestry related activities), the event must be dealt with in accordance with the *BC Timber Sales Environmental Management System*, including site specific *Emergency Response Plans* and the *Emergency Response Manual*. Contact numbers and instruction for documentation of the incident are available in these plans.

5.0 Best Management Practices (BMPs)
While it is impossible to prevent sediment from leaving disturbed construction sites due to rainfall and snow melt, significant reductions can be realized. This plan does not address all possible mitigation measures that are available to implement; however, information has been incorporated to increase the effectiveness of the most common BMPs found in forestry watercourse crossing culvert installations. Refer to Table 1 for recommended BMPs. For additional information, refer to the *BC Timber Sales Environmental Field Procedures* and the *Forest Road Engineering Guidebook*. All BMPs will be installed as per specifications in the *BC Timber Sales Field Guide Sediment and Erosion Control Field Guide*.

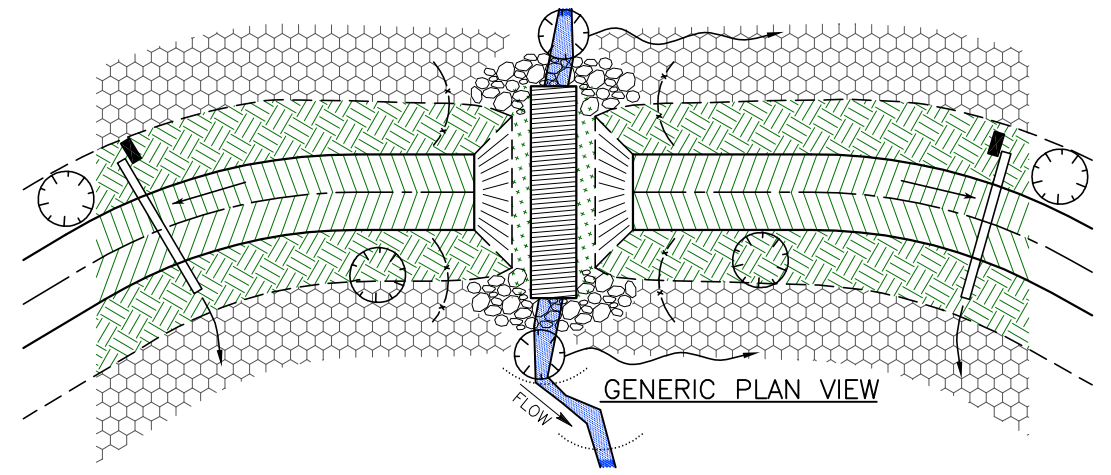
6.0 Contingency Plans
Contingency plans are additional mitigation measures that will be employed if unforeseen environmental concerns are encountered during construction. These plans include having extra sediment/erosion control materials on-site and halting operations if heavy or persistent rainfall is encountered.

An emergency supply of sediment control materials will be available on-site which may include; silt fencing, geotextile, tarps, sandbags, seed, straw bales and volume pumps with discharge hose.

If works are temporarily suspended due to heavy precipitation, the site will be monitored during the shutdown period to ensure environmental concerns are adequately addressed.

Should unanticipated site conditions or unseasonably wet weather be encountered during construction, the BC Timber Sales representative will be immediately contacted to reassess the project. If increased environmental risk is perceived, site specific plans/measures may be required.

7.0 Inspection and Maintenance
During construction, regular inspections of the BMPs will be made, especially after heavy precipitation events. If any measure is not functioning as intended, it will be immediately repaired/replaced. All inspections and actions shall be documented.



PROJECT TITLE		BCTS-SECP-C		DESIGNED BY: BAA, RPBio	
PROJECT LOCATION(S)				CHECKED BY: RT, BCTS E.O.	
DATE		DRAWING NAME:		REV.:	
NAME		DATE ISSUED: 02/05/06		DRAWN BY: WG	
SIGNATURE		DWB Forestry Services Ltd. 1A, 1750 Quinn Street Prince George, B.C. V2N 1X3 Phone: (250) 562-5541 Fax: (250) 562-5561			
BCTS REPRESENTATIVE					
CONTRACTOR					

