SOP Title: FO – SOP 22 Road Reclamation

Purpose:

Describe the assessment of road reclamation when conducting forest operations inspections.

Procedure:

In all cases legislation requires that natural drainage be maintained or reclaimed watercourses be protected, soil stabilized and erosion prevented. Specific requirements for road reclamation are found in applicable Operating Ground Rules, disposition conditions and/or harvest plans and approval conditions. As such the requirement to return roads to productivity and control access may vary.

Timelines may also vary, it is important to know how much time is allowed to complete reclamation. Requirements such as erosion control and watercourse protection, however, are not restricted to reclamation alone so it would not be acceptable to "put these off" until the reclamation deadline.

Natural Drainage

The disruption of natural drainage by road reclamation is usually indicated by either water running down the surface of the road, or water blocked and backed up by the road. Water running down the road is likely to cause erosion. If drainage is blocked and backed up by a road the inspector should look to see if this is caused by surface obstruction such as a berm / sidecast material, raised road surface, sidecast material rolled back onto the road or a non functioning drainage structure (such as a log fill or blocked culvert). It is possible that subsurface drainage has been blocked by a compacted road surface, in which case the inspector should look to see if there is an excavated cross ditch running from one side of the road to the other. The area above and below the blockage should be checked to see if it is a watercourse, and if so, if it was crossed appropriately.

Watercourse Crossings

Watercourse crossings are particularly sensitive areas on roads and should be given close attention. In most cases crossing structures will be removed upon final abandonment of temporary roads. All logs and culverts should be removed from the watercourse channel before spring break-up (except where leaving logs within the channel has been specifically authorized).

Any debris authorized to be left on site (such as logs, depending on specific OGRs) should be moved above the watercourse high water mark. If the crossing did not leave the channel intact (as with some culvert installations) the channel may have to be re-contoured. This should result in a channel that is clear of obstructions, has a similar profile to the undisturbed channel and has banks left at a stable angle. Geotextile and damaged culverts are waste and must be removed.

Erosion Control

When assessing erosion control Forest Officers should avoid being prescriptive and assess based on results. This is a general rule, but any act or structure that is explicitly required within OGRs, plans, or approvals should be carried out or installed. If erosion has not occurred after break up and several significant weather events, erosion control is probably

sufficient. If the Forest Officer thinks more should have completed, this should be noted but instructions or enforcement will not normally follow – there is latitude for differences of professional opinion. If erosion has occurred, the extent of erosion control efforts should be noted as they may indicate due diligence.

Water running down the bared surface of a road can cause erosion. While not specifically prohibited on roads, ruts can accelerate the flow of water and increase the rate of erosion. Several engineering structures or reclamation techniques can be used to limit erosion.

Waterbars divert water off the road surface into ditches, or into the cutblock where the water velocity is dissipated on the intact forest floor. Waterbars are shallow excavations with a small berm on the downhill side, angled downslope off of the road. They should be more like a speed bump than a “tank trap” and may be installed on active roads.

Spread strippings from roll back can interrupt the continuous flow of water down a sloping road, preventing the build up of velocity that causes erosion. This can include or be augmented by woody debris laid perpendicular with the slope.

Ditch blocks are barriers installed in a ditch on a slope to prevent the water from building up too much velocity. They may also pool water for a period allowing silt to settle out before water flows over the top of the ditch block. They may be constructed from soil, rock, wood or introduced material such geotextile matting. They require a lot of maintenance (repair to eroded structure and removal of built up silt) and are used during temporary or seasonal reclamation, rarely are ditches left intact after full or permanent reclamation.

Silt fences are geotextile barriers, usually installed in ditches, designed to allow water to flow through, but intercept silt and stop it from entering a watercourse. Like ditch blocks they require a lot of maintenance and are often an indication that other erosion control efforts have failed. They are rarely a feature of a permanently reclaimed road, though they may be used while seeding is being established.

Reclamation often involves re-contouring of cuts and fills, where this is done any slope should be left at a stable angle. A slope of 2:1 (HD:VD equal to 50%) is often considered stable, but this varies depending on many factors such as soil texture and moisture, or position on slope. This can be a subjective judgment, where an officer has concerns about the stability of a slope this should be brought forward to the company who, once aware of the concern, can use their professional judgment and will be accountable for their decisions and actions.

Revegetation controls erosion by binding soil particles to root structures, intercepting wind and rainfall in the live foliage, and protecting the soil surface with a layer of leaf litter. This is normally done by seeding bared and / or erodable surfaces with an approved native seed mix.
Natural revegetation may be quick and effective if roads minimized disturbance of the organic layer, roll back introduces sufficient seed or rooted vegetation, or the site is occupied by and suited to vigorous native vegetation such as Calamagrostis. Normally individual seeds from recent seeding are visible. On high risk sites coconut matting or hydro-seeding may be used. These techniques combine seed with biodegradable mulch that also acts to prevent erosion by providing a physical barrier between the soil and wind, rainfall, and to some extent surface flow. Whether the amount of revegetation is adequate to control erosion is usually determined based on the effectiveness of the activity.

Returning Productivity

Productivity may be restored by decompaction, rolling back the strippings, revegetation and reforestation, critical point is maintaining the A horizon in the soil profile when reclamation activities occur.

From an ESRD regulatory standpoint, inspectors check to ensure that reclamation was completed as per the approved plan within a specified timeframe. The effectiveness of the reclamation is up to the specific company to assess as they risk manage based on due diligence and professional discretion. ESRD will be able to quantify the effectiveness of the reclamation at the time of the establishment and performance survey.

Beyond stabilization and erosion control, the purpose of roll back is to return nutrient rich organic topsoil stripped during road construction to the disturbed area. To be effective the spreading should be uniform. As an inspector, the activity should be completed to point where planting spots are created so the company can meet silviculture survey stocking requirements.

Access Control

Access control barriers can include woody debris, roll back, berms, rocks, cross ditches, or gates. Access control may be in the form of a notice alone. Assessment is dependent on the specific requirements outlined in the applicable OGRs, plan or approval conditions.

Authorities:

Section 21(1) of the Forest and Prairie Protection Regulations, Part ll
Section 100(1) (i) TMR
100(1) (a) and (b) TMR

Revision History				
Revision #	**Revision Date**	**Revision Reason**	**Reviewed by**	**Approved by**
5.0	April 28, 2011	Annual Document Review		Darren Fearon
6.0	April 30, 2012	Annual Document Review	Andre Savaria	Robert Popowich
7.0	May 13, 2013	Annual Review	J. Koch	Robert Popowich
8.0	June 24, 2014	Annual Review	J. Koch	Robert Popowich
9.0	April 20, 2015	Annual Review	D. Fearon	Robert Popowich
10.0	October 1, 2015	Updated reference to Forest Officer	Darren Fearon	Robert Popowich