Overview

- Sedimentation and Erosion – What is it?
- Why do we care?
- How to spot serious issues
- Examples and solutions
Sediment Pollution
1.3 Soil Erosion

Causes of erosion are:

• Gravity
• Wind
• Water
Why do we care?

• The effects of sedimentation on aquatic species and their habitat
A reduction of light penetration from suspended sediment:

- limits heat input
- reduces productivity at every level in an ecosystem
- affects both streams and lakes
Sediment and fish populations

- Dirt in the water will change fish feeding behavior, since prey is less visible
- Sediment reduces the abundance of insect larvae and smothers those that live on the bottom
- The suspended sediment can damage gills
- Effects of several crossings can add up
Potential impact of sediment on fish habitat

- Fish avoid areas of high sediment – leaving them with less space to live in

- Loss of spawning habitat

- Loss of insect and plant habitat

- The stream channel gets wider and shallower as it fills with sediment – then warmer
Fish Spawning

- Incubating egg
- Gravel + rocks
- Predator
- $O_2$
- Wastes
- Spaces
- Sediment
SUMMARY

To reduce the impact on fish:
• Allow fish passage through stream crossings
• Prevent erosion
• Keep “deleterious substances” out
• Save streamside vegetation
Why do we care? Government Regulations!

- Fisheries and Oceans Canada
- Alberta Sustainable Resource Development
- Alberta Environment
- The company who owns the road is responsible for the crossings
- Large fines
- Poor public image
How to spot sedimentation issues?
Gabion baskets used to armour the inflow
Bridge deck separating from road
Failed abutment
Treated wood wingwalls that are failing
Markers (Y): Good bridge reflectors
Structural problem (C): culvert sections have separated
Structural problem (S): sunken deck
Structural problem (SL):
slumping caused by gullying under bridge
When used properly, silt fences are effective in controlling sedimentation.
1. Preliminary Inspection

Blocked diversion ditch (requires remedial measures)
1. Preliminary Inspection
False ditch
3. Sediment Source Inspection
4. External Sediment Source Inspection
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4. External Sediment Source Inspection
Mud build up on deck
Preventive Measures

- Armouring exposed soil
- Diverting flowing water
- Road Maintenance
- Monitoring for effectiveness
- Reporting
Vegetation is considered armour from an erosion perspective.
Armour – Silt Fence
Armour – Silt Fence
Armour - vegetation
Armour – Rip Rap
Riprap, silt fence and geotextile curb
When used properly, silt fences are effective in controlling sedimentation.
Slash, Rip Rap and Silt Fencing
Diversion Ditch - Maintain
What resources do you need to improve the condition of stream crossings on your company’s road?