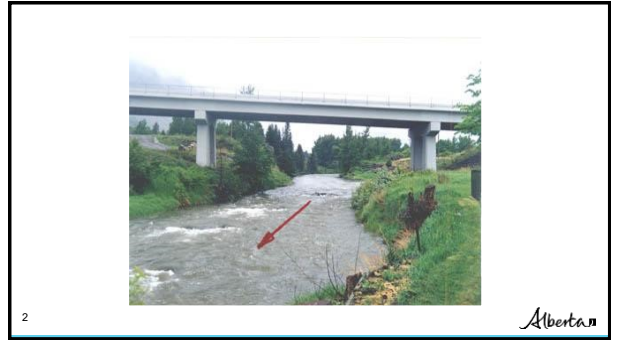



HYDROTECHNICAL CONSIDERATIONS



1




2

- ## Overview
- Hydrotechnical Design
 - River Issues
 - Lateral Stability
 - Vertical Stability
 - Blockage - ice, drift
 - River Protection Works
- 

3

Hydrotechnical Design



4

The Hydrologic Cycle

5

Alberta

5

Drainage Basin Parameters

- Area
- Shape
- Slope
- Storage
- Density
- Vegetation
- Soil Type
- Initial Moisture

6

Alberta

6

Hydrotechnical Design

- Channel Capacity
 - channel size result of long-term runoff
 - channel size affects routing of runoff
 - typical channel
 - activate overbank storage
- Historic Highwater Data
 - HWM – AT, AE, WSC, site, air photo, news
 - Location, description
- Basin Runoff Potential
 - Limit on supply of runoff
 - Unit discharge

7

Alberta

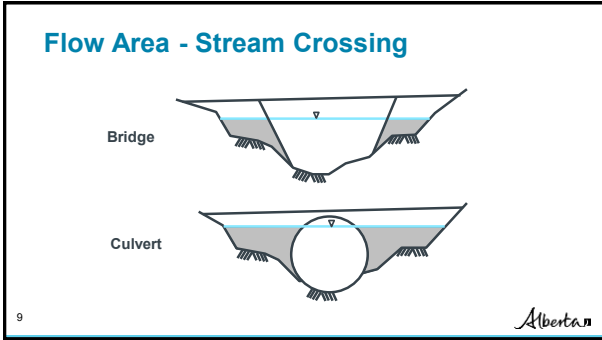
7

Hydraulic Definitions

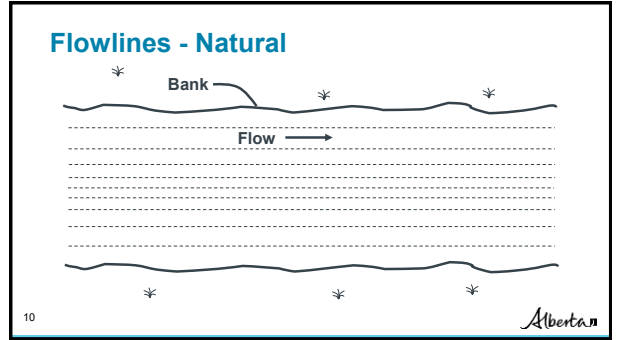
8

Alberta

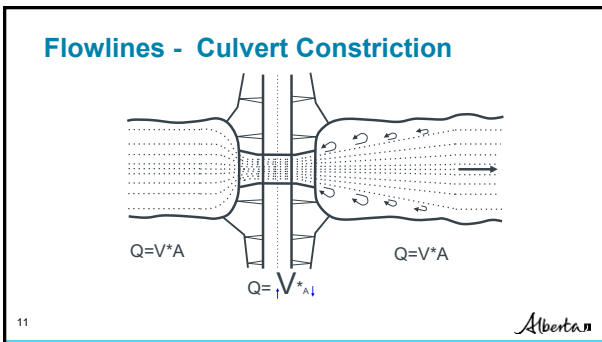
8



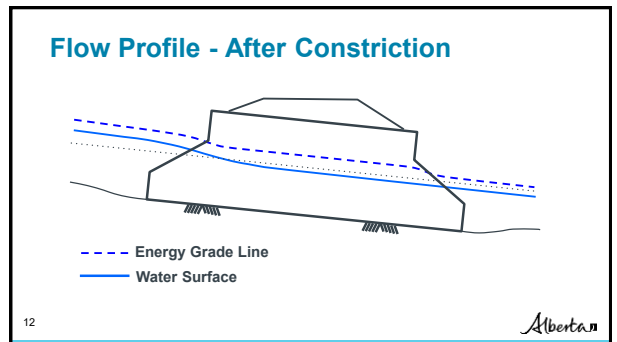
9



10



11



12



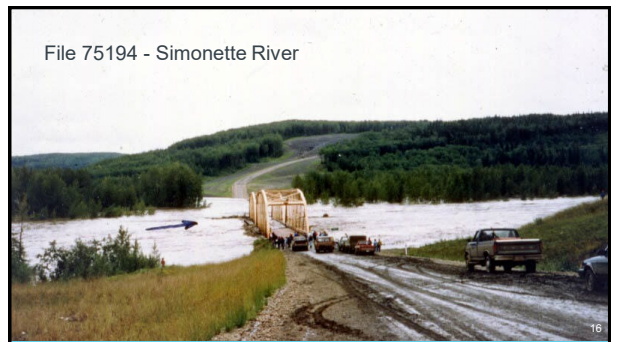
13



14



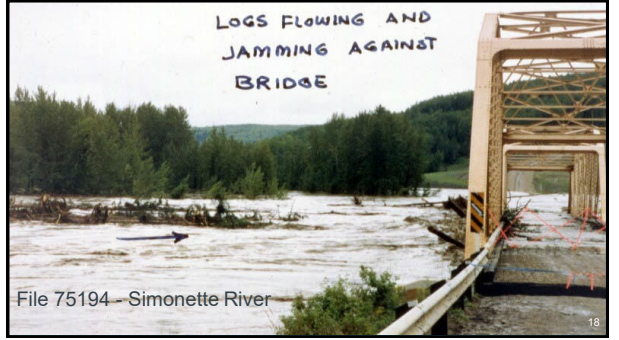
15



16



17



18



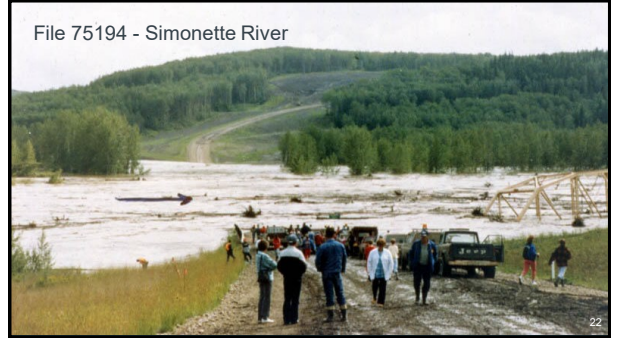
19



20



21



22



23



24



25



26



27



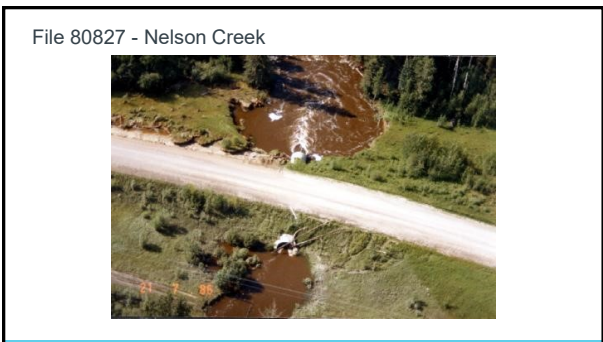
28



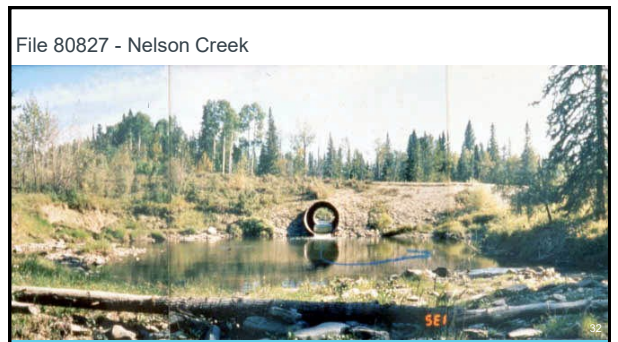
29



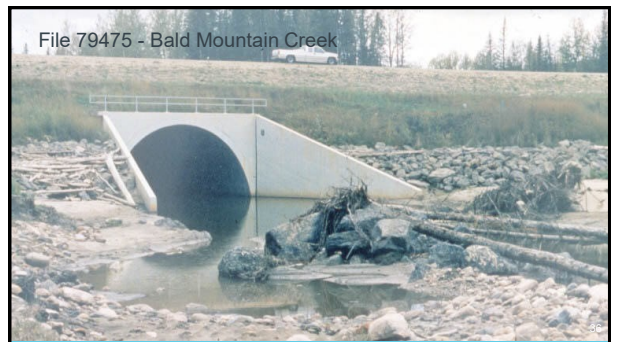
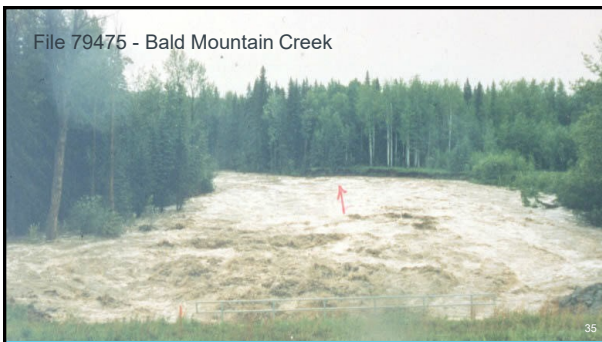
30



31



32






River Issues

Lateral Stream Stability

41

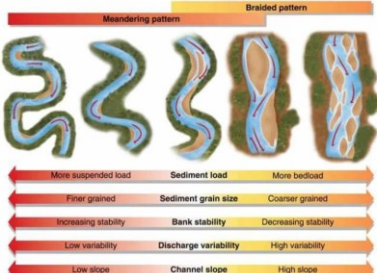


41


Stability of Stream Types

Meandering pattern Braided pattern

Prairies Mountains

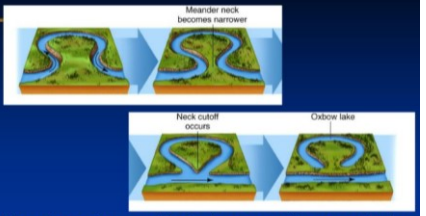


42




42

Meander Cutoff



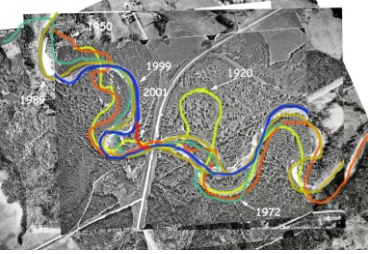
How does the gradient change with meandering and meander cutoff?

43




43

BF9259 – Freeman River



44



44



45



46



47



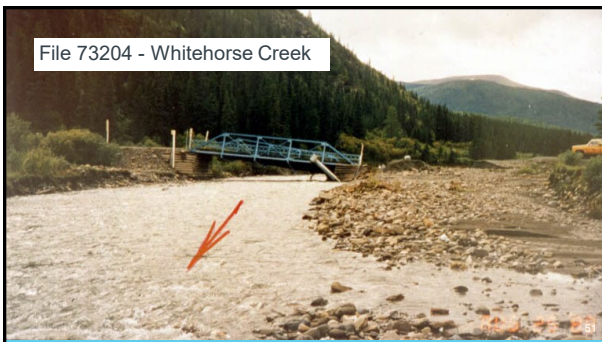
48



49



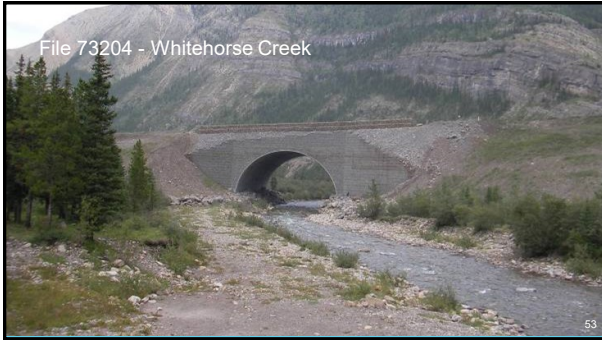
50



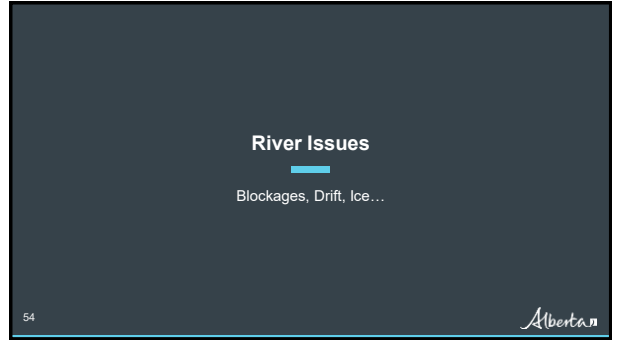
51



52



53



54



55



56



57



58



59



60



61



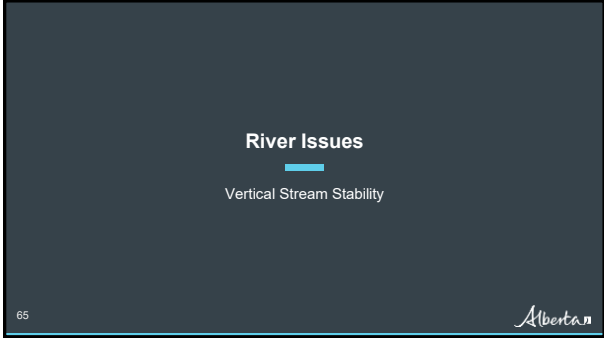
62



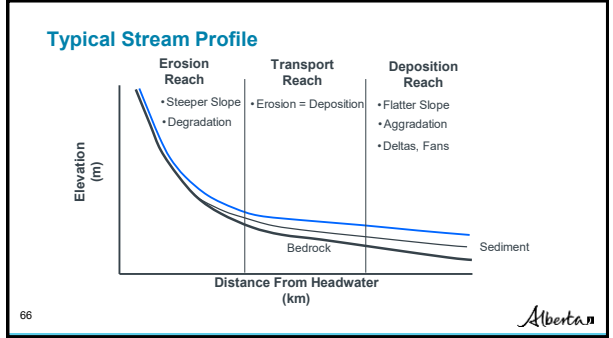
63



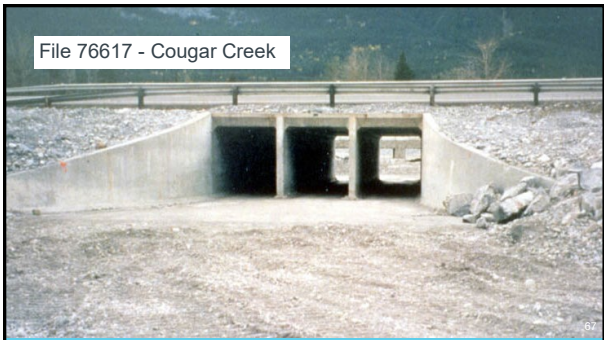
64



65



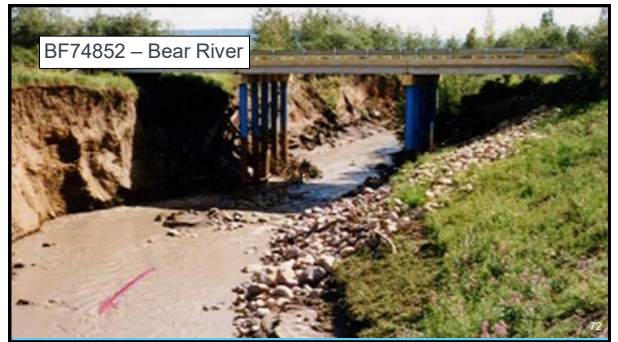
66

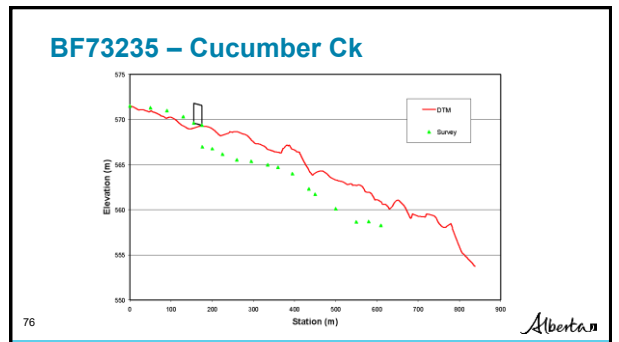
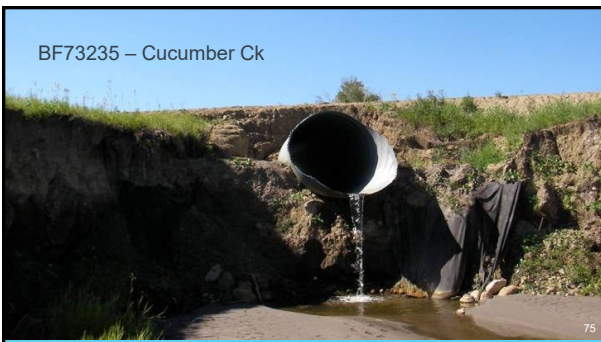


67



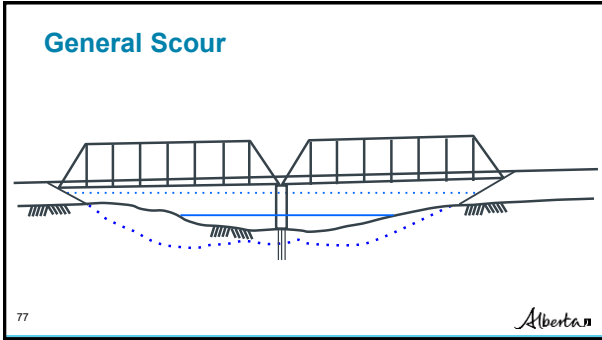
68



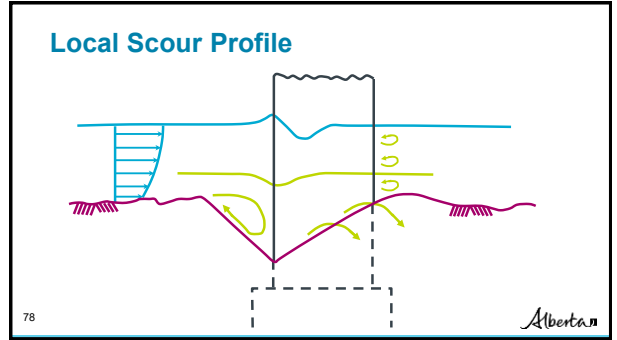


75

76



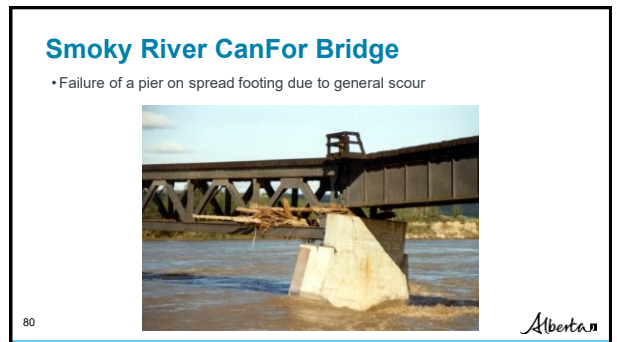
77



78




79



80

Drift accumulation

Increased velocities and scour around piers.



81

Alberta

81

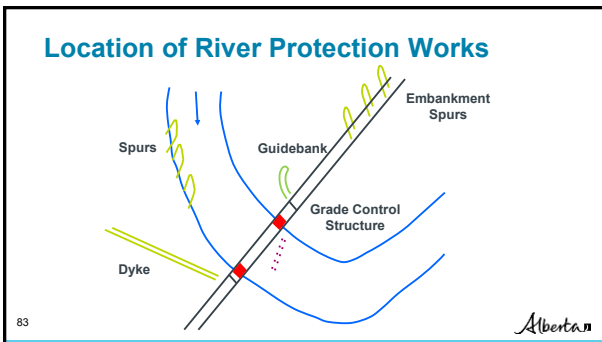
River Issues

River Protection Works

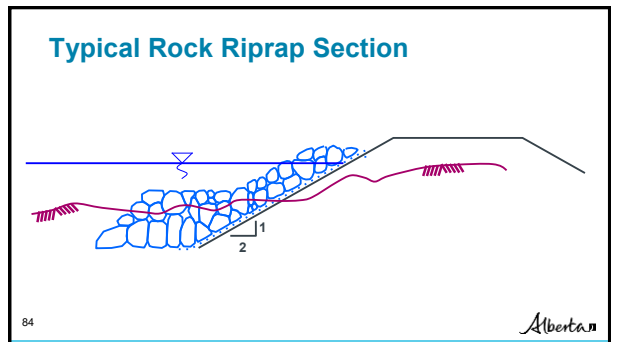
82

Alberta

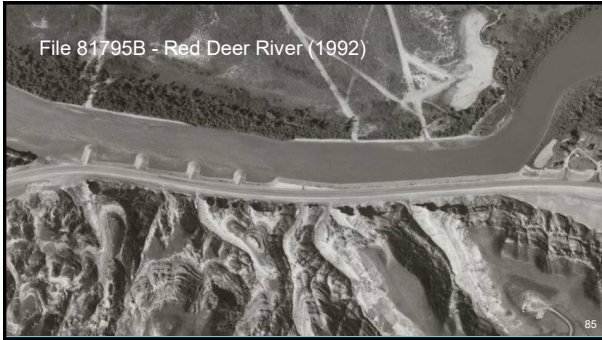
82



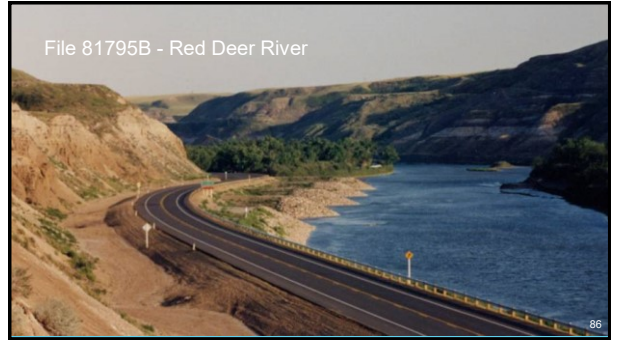
83



84



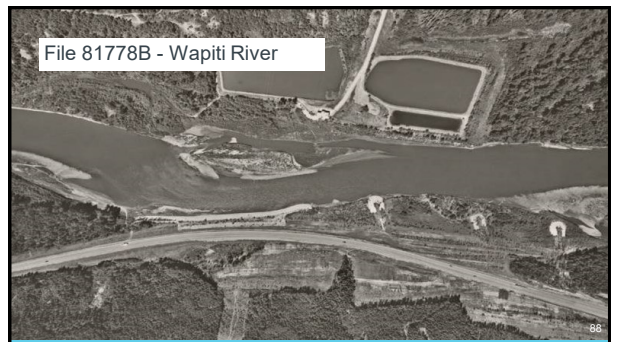
85



86



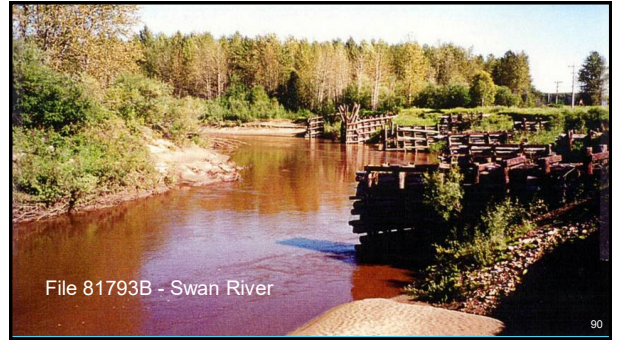
87



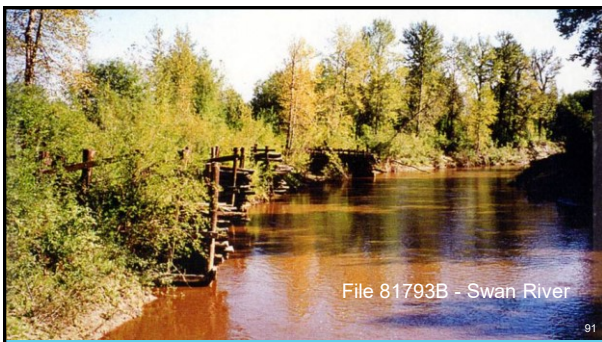
88



89



90



91



92