Geomorphologic Features of Nelson

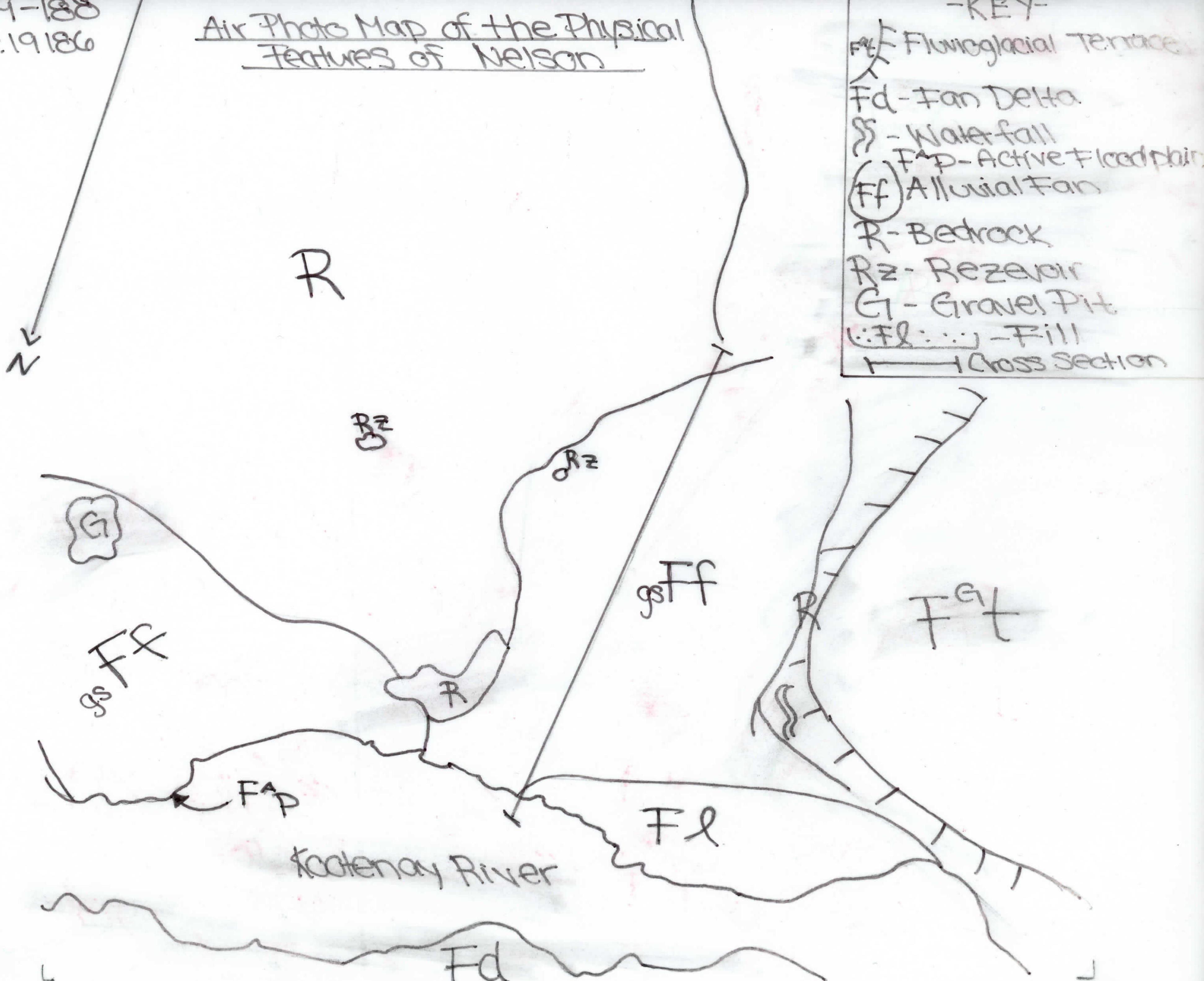
- great photos

14/15

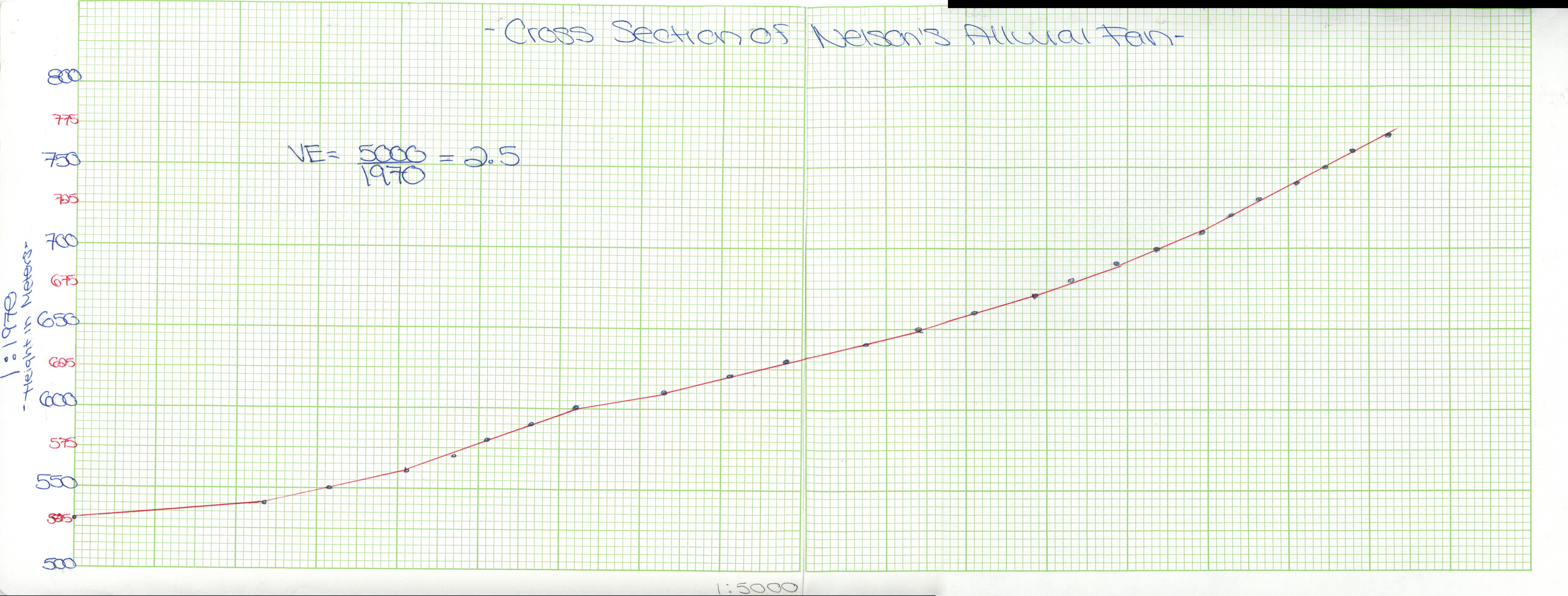
Geomorphology 232
Gillian Eggleton
April 08, 2005

BC5179-188
Scale: 19186

Air Photo Map of the Physical Features of Nelson



-Cross Section of Nelson's Alluvial Fan-



Geomorphic History of the Nelson Area

Throughout the last ice age (approximately 15,000 years ago), four major periods of glaciations took place. After each one, a temperate climate followed, very close to the one that we experience now days. Ice had covered most of the Kootenay region; only peaks that had an elevation higher than 7,000 feet were exposed through the ice. When the ice began to melt, the sides quickly receded, leaving plugs of ice in the centre of the valleys. As glacier melt water streams ran down the valley, they would deposit ~~access~~ EXCESS materials (the load) against the remaining ice plug. After the ice melted, our region was left with flat, ridge-like terraces, known as kame terraces. These terraces are composed of sand and gravel that have formed adjacent to the ice plug.

In the case of Nelson, the ice filled the valley and as it melted, material built up and formed the area, known today as Rosemont, as kame terraces. The central part (where the ice plug had been situated) would be classified as an alluvial fan. (Anderton n.d.)The alluvial fan that Nelson has been built on is an on land deposit of sediment (usually sand or gravel). It flowed out of the valley and formed as a result of the streams decline in ability to carry sediment. This reduction was cause by an increase in the streams width, therefore the velocity and depth is decreased and the material is slowly spread out over a flat plain. (Trenhaile 2004)

The alluvial fan that the town of Nelson is situated on could also be considered a "kame fan". Kame fan meaning that as the ice melted and the load tumbled down the valley, it built up ~~on~~ AGAINST a chunk of ice that still existed where Kootenay Lake is now. After the last portion of the ice melted, our kame fan was then considered an alluvial fan.

The kame terraces of the Nelson and surrounding area have rolling and uneven surfaces. This type of landscape may consist of a series of kame mounds and/or kettle holes, as a result of ice blocks melting and slumping.

As the ice melted further, glacial lakes were created, consisting of great deposits of silt. Kootenay Lake is an example of a glacial lake. Eventually the ice melted away and rivers began to flow over the valley fill and eventually cut down into the fill, creating a series of river terraces (though not visible in the Nelson area, they are farther down the river at Castlegar. (Anderton 2004)

If you were to take a look along the siding of the Rosemont terrace, you would come across a beautiful waterfall known as Cottonwood Falls. This waterfall seems to run in-between an outcrop of fairly resistant rock. In the case of this waterfall, there had previously been a dyke (vertical igneous intrusion of rock) that occupied that space. It most likely consisted of weak rock; therefore as the stream began to run down the rock face, erosion took place. Erosion by water has continually been occurring, carving out the waterfall that is present today. (Trenhaile 2004)

Photo and Map Data

Photo # and Flight Line → BC5179-188

Photo Scale Calculations:

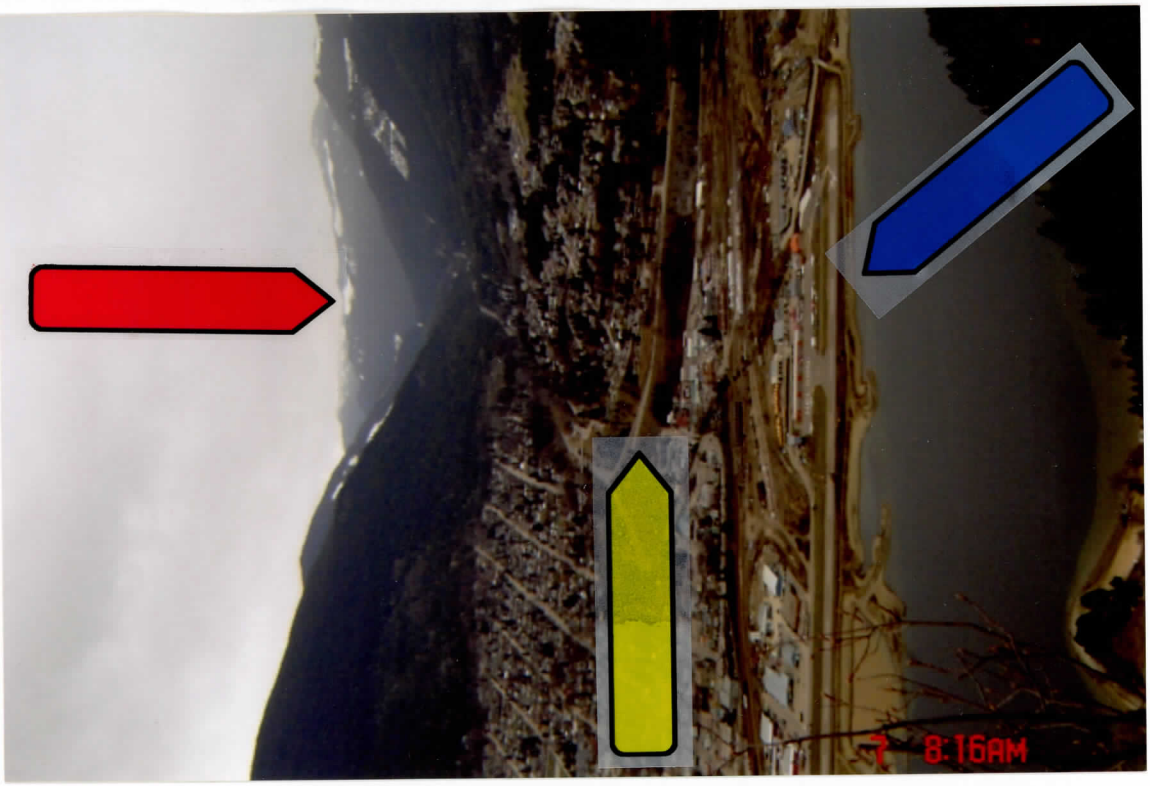
$$\frac{\text{Photo Distance}}{\text{Map Distance}} = \frac{\text{Map Scale (50,000)}}{\text{Photo Scale}}$$

$$\frac{8.6\text{cm}}{3.3\text{cm}} = \frac{50{,}000}{x}$$

$(50{,}000 \bullet 3.3 \div 8.6)$

Photo Scale = 19186

1 : 19186



(Hanson Ck (Red) Fill (BLUE)

In the above picture of Nelson, we are able to see the valley in which the material came down to form the alluvial fan. Also note the area along the lake (airport and industrial sites) which is an area that has been filled in. In this picture you can also see Rosemont to the right. Note how it seems relatively flat and raised from the rest of Nelson. (YELLOW)

By Anderson Ck.

In the picture above, we are able to identify the gravel pit that is situated above Fariview (another small alluvial fan). This pit predominatly consisits of sand and gravel, though rock chucks and small boulders are present.

In these two pictures, we are able to see Rosemont has a kame terrace, which has resulted from glacial processes. We can see how it is raised compared to the portion of Nelson built on the alluvial fans.

These two pictures show the large chuck of bedrock that is located just a couple blocks from downtown Nelson. This rock face is known as Gyro Park lookout. Note the white rock in the middle. This is probably a type of igneous intrusion and also you are able to see that cracking has occurred along the joints in the rock. This was probably caused by frost weathering, as water gets in the cracks and freezes, causing the striated look in the rock.

The above picture is of Cottonwood Falls, that runs alongside the Rosemont Terrace. As the water flows, erosion continually takes place and the falls recede a small amount each year.

This picture shows the Fariview areas of Nelson, as another small alluvial fan that flowed down an adjacent valley.

The above picture was taken to display an example of the material that the kame terrace is made out of. This small hillside in Rosemont has most likely gone through a mass wasting process; probably just minor slumping. For this reason we are able to see inside the hill, where we can observe that the material present is sand and gravel with rocks and few boulders.

This picture is of the smaller of the two reservoirs that sit up Uphill Nelson.

FAN on top delta below water level.

In the above picture we are able to see an example of a fan delta. This feature occurs when a stream drops its load into a body of water (in this case, Kootenay Lake) instead spreading it over land.

The picture above portrays the lakefront area, where we are able to see how it is been filled in. Note the elevation differences, once again between it and Rosemont above it.

References

Anderton, Lesley J. "Mesozoic Of Western Canada." Geology 142, Selkirk College. 24 March, 2004.

Anderton, Lesley J. "The Terraces and Surficial Geology of the Columbia Valley at Castlegar B.C. (n.d.) 77p.

Trenhaile, Alan S. 2004. Geomorphology, A Canadian Perspective. Toronto: Oxford University Press. 269-271 p.