



**UNPROCESSED GROUND  
PENETRATING RADAR FOR THE  
KOMIE NORTH GLACIOFLUVIAL  
DELTA, NORTHEAST BRITISH  
COLUMBIA (NTS 94P/5)**

By T.E. Demchuk

**GEOFILE 2010-13**

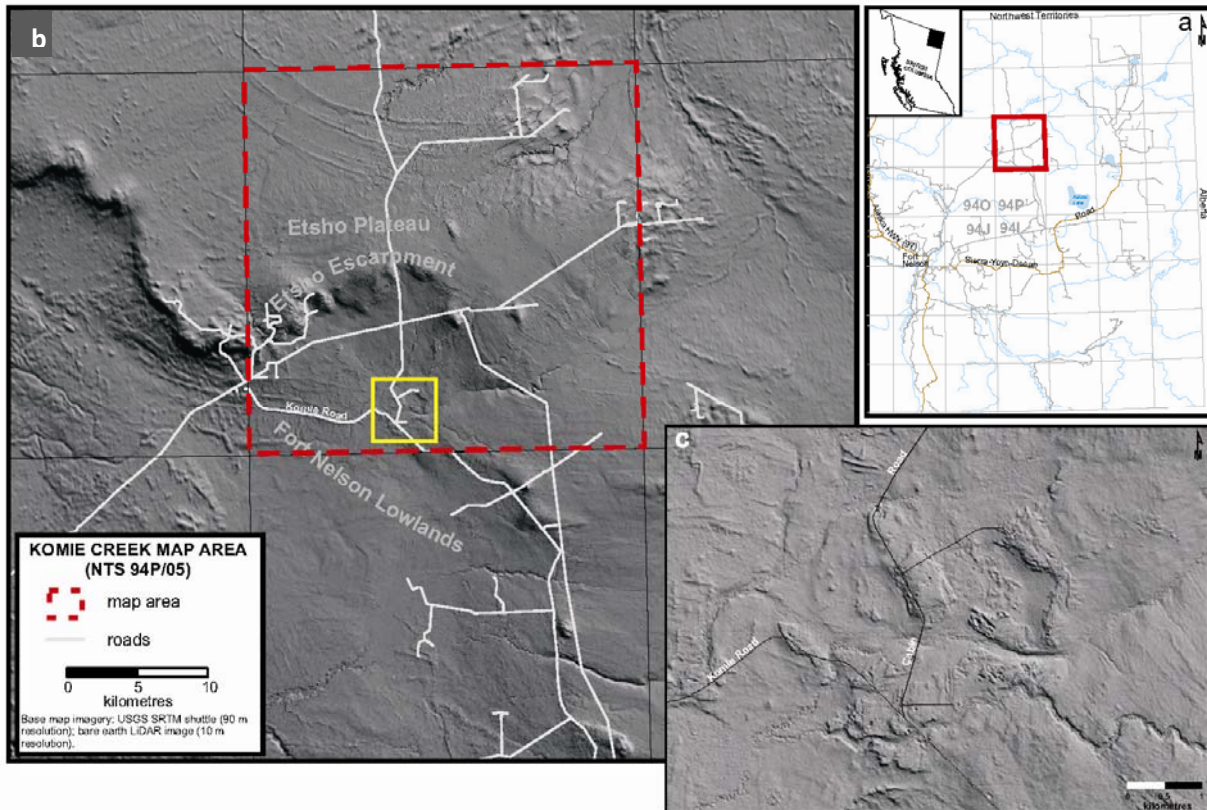


# Unprocessed ground penetrating radar for the Komie North glaciofluvial delta, northeast British Columbia (NTS 94P/5)

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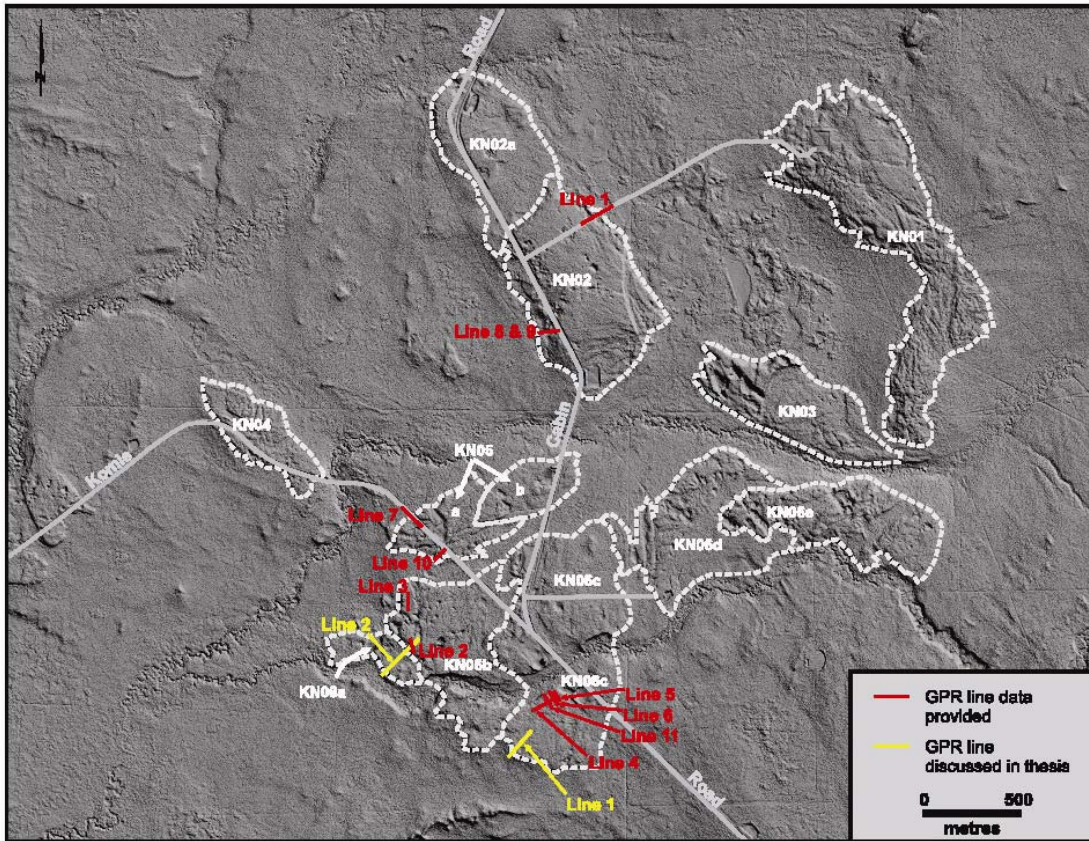
## INTRODUCTION

The ground penetrating radar (GPR) data provided in Geofile 2010-13 were collected during field studies at the Komie North glaciofluvial delta in northeastern British Columbia (Figure 1). The data was collected as part of a research project investigating the genesis of the glaciofluvial delta. This work was also part of the northeast BC Aggregate Program of the Ministry of Energy, Mines and Petroleum Resources. Further information about this area, including surficial geology and sedimentology, are presented by Demchuk (2010). The data presented here include JPEGs of unprocessed GPR data and raw data files for processing. Processed data collected during this survey are also presented by Demchuk (2010).



**Figure 1.** (a) Study area location in northeast British Columbia. (b) Study area showing Etsho Plateau and Fort Nelson Lowland. (c) Detailed view of the Komie North glaciofluvial delta (outlined by yellow box in b).

The files included in this report are a combination of common offset and common mid-point surveys. Figure 2 shows the survey locations at Komie North and Table 1 lists the location coordinates for each line.



**Figure 2.** Ground penetrating radar survey line locations at Komie North. The unprocessed data for the lines in red is included as part of this Geofile. The background image is a LiDAR DEM with 2 m horizontal resolution.

### SURVEY TYPE AND PARAMETERS

A pulseEKKO100 designed by Sensors and Software was used to complete the GPR surveys. A transmitter frequency of 100 MHz was used to obtain a horizontal resolution of approximately 0.5 m and a maximum theoretical depth penetration of 15 m. This frequency is commonly used for subsurface imaging of glaciofluvial and fluvial sedimentary structure as it provides a balance between resolution and depth of penetration (Neal, 2004). A digital video logger (DVL) recorded and displayed the data in real time.

The surveys were conducted using step mode data acquisition to complete common offset surveys. For the surveys, a 1 m antenna separation, a 50 cm step size and a time window of 812 ns were used. These parameters were selected based on sediment type and sedimentary structures predicted to occur along the survey lines and to provide a balance between resolution and efficiency of data acquisition. Individual survey lines ranged in length from 20 to 200 m. For this study, resolvable features ranged in size from tens of centimetres to metres.

During the GPR surveys, daytime temperatures ranged from -10° to -25°C. These temperatures caused problems with battery charges, the DVL liquid crystal display (LCD), and may also have created time zero drift (Neal, 2004). Time zero drift was corrected during data acquisition by warming the instrument to bring its temperature closer to that of the ambient air temperature.

The surveys were conducted along seismic cut lines away from roads. Efforts were made to ensure that the surveys were conducted away from sources of interference such as vehicles, pipelines, and radio and electrical transmission towers.

**Table 1.** Ground penetrating radar survey line start and end points. All antenna separations are 1 m and step size is 0.5 m, unless otherwise noted.

Line	Start	End	Survey Direction	Notes
1	568106 6572774	567943 6572678	west to east	Line located on eastern margin of lobe 2 near its northern end. Survey completed beside the lease road that crosses this lobe. Step size for this survey is 0.25 m.
2	567088 6570496	567073 6570550	south to north	Line located on seismic line at lobe 6b.
3	567077 6570676	567076 6570794	south to north	Line located on seismic line at lobe 6b, north of GPR line 6.
4	567703 6570152	567821 6570026	west to east	Line located on flat, clear cut area on lobe 6c.
5	567846 6570197	567793 6570254	north to south	Line located on flat, clear cut area on lobe 6c. Perpendicular to line 10
6	567773 6570259	567833 6570195	north to south	Line located on flat, clear cut area on lobe 6c. Perpendicular to line 10
7	567057 6571226	567142 6571141	northwest to southeast	Survey along Komie Road across lobe 5a
8	567747 6572147	567784 6572147	west to east	Line located on western edge of lobe 2. Survey climbs up step-like margin of lobe from bog-level towards cabin Road. Joins with line 20.
9	567784 6572147	567849 6572151	west to east	Line located on western edge of lobe 2. Survey climbs up step-like margin of lobe from bog-level towards cabin Road. Joins with line 19.
10	567187 6570970	567225 6570988	west to east	Line located on edge of lobe 5a.
11	567822 6570183	567766 6570251	north to south	Line located on flat, clear cut area on lobe 6c.
12	567628 6569970		CMP survey	
13	567695 6570044		CMP Survey	
14	567709 6570141		CMP survey	

## REFERENCES

- Demchuk, T.E. (2010): Surficial geology of the Komie Creek map area and an investigation of an ice-contact glaciofluvial delta, northeast British Columbia (NTS 094P/05), unpublished MSc thesis, *University of Victoria*, 266 pages.
- Neal, A. (2004): Ground-penetrating radar and its use in sedimentology: principles, problems and progress; *Earth-Science Reviews*, Volume 66, pages 261-330.