

# The Cache Creek Mélange

SITE #020201

GC1TQDF

Written & Researched by Bruce Madu

## SITE IDENTIFICATION

Nearest Community: Cache Creek, V0K 1H0  
 Location: N 50°48.502'  
 W 121°19.691'  
 Parking: N 50°48.507'  
 W 121°19.676'  
 Geocache Location: N 50°48.501'  
 W 121°19.653'  
 Accuracy: 5 meters  
 Letterboxing Clues: Refer to letterboxing clues page  
 UTM: East 0617835;  
 North 5629846 10U  
 Geocache altitude: 472 m./1,548 ft.  
 Overall difficulty: 1  
 Terrain difficulty: 1.5  
 (1=easiest; 5=hardest)  
 Date Established: n/a  
 Ownership: Village of Cache Creek  
 Access: • Public Road  
 • Year-round  
 • Vehicle accessible  
 • Turn west at the junction of Hwy #97N and Hwy #1.  
 • Follow Todd Rd. across the bridge & park in gravel lot.



Local residents have found it curious that almost all geological field trips that pass through this part of B.C. stop in town at this location – why?

At first glance this road cut looks like pretty typical rocks, there are some layers and the rock is more or less....well...grey. But to trained eyes these rocks hold valuable insights into the geological history of British Columbia, especially the movements of continent-sized tectonic plates and the beds of very ancient oceans.

The scene before you is a jumbled mix of rock types, dominated by argillite (shale) and chert. Both are known to have formed in a deep ocean environment. Micro-fossils within the rocks tell us they were laid down primarily in the Triassic period, which spanned from 206-248 million years ago. If you have a pocket knife or other hardened steel instrument with you, you may try scratching these rocks and find some are quite soft (argillite) and others exceptionally hard (chert). Area First Nations would seek out rock such as chert

for knapping into tools such as scrapers or arrow heads.

If you look up a few meters, at the rock cut just north of the bridge you crossed to get here, you'll see a light color block of rock that is about 2 meters high and a meter across. It stands out considerably from the darker rock that contains it and is at about the same level of the wires that pass in front of it. Once you have spotted it, you have discovered the essence and significance of this stop.

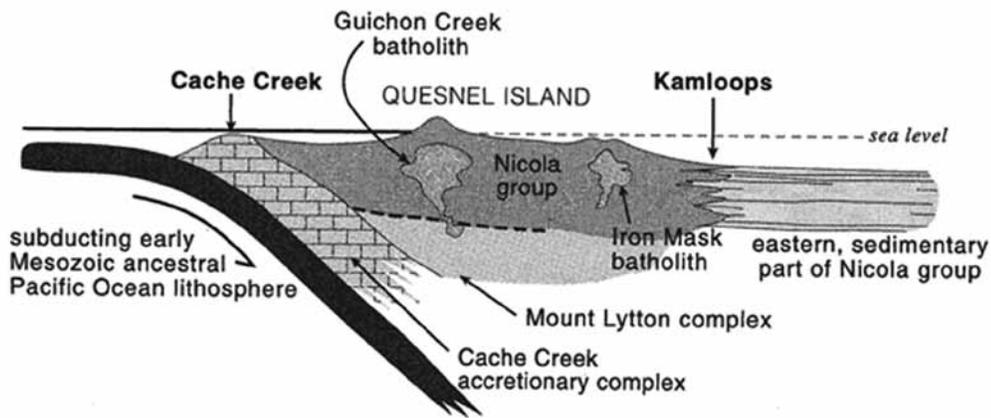
The block is comprised of limestone and, unlike the rocks around it, formed in a relatively shallow marine environment. Fossils within the rock tell us it formed during the Carboniferous period and is at least 60 million years older than the rock that surrounds it.

Geologists have borrowed the French word *mélange* to describe such scrambled collections of rock types, a word which simply means "mixture." What you are looking at here is a small section of the Cache Creek *mélange*, a geologi-

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*Cartoon showing the probable relationships between the oceanic rocks (argillite, chert, in black) and limestone rock units (brick pattern) during the period of geologic time where there was an active subduction zone underneath modern day Cache Creek (Mathews and Monger, 2005).*

cal unit which can be traced up and down much of the length of British Columbia. Prior to understanding plate tectonic theory, the motions of the earth's crustal plates on a plastic mantle, mélanges such as this one were very difficult to explain.

Between about 225 and 180 million years ago these oceanic rocks were on a virtual conveyor belt heading eastward, colliding with a collection of volcanic islands, ancient oceans and the westward bound North American tectonic plate at a convergent plate margin. In this zone, the oceanic rocks were forced underneath the competing rocks to the east (or subducted) to be remelted as they descended back into the molten mantle: this geological feature is known as a subduction zone.

The Cache Creek mélange represents the remnant scrapings that were made above this subduction zone as oceanic rocks lost their battle in a squeezing contest with the dominant rocks to the east and formed what is called an accretionary wedge.

It is this history of geological events that has given us what we see today. Massive limestone blocks seemingly ripped from their origins and consumed within argillite and chert host rock, echoing the very tectonic events that shaped British Columbia's complex geological history.

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#### BIBLIOGRAPHY & SOURCES

Mathews, B., & Monger, J. (2005). *Roadside Geology of Southern British Columbia*. Missoula, MT: Mountain Press Publishing.