

# SOURCE, TRANSPORT AND DISTRIBUTION OF FLUORIDE IN DRINKING WATER RESOURCES IN NORTHERN THAILAND

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**SUMMARY:** Over a thousand samples were collected from surface (streams and rivers) and sub-surface (wells of varying depths) waters across the provinces of Chiang Mai and Lamphun, Thailand to be tested for the presence of fluoride. At the hotspots of the high-fluoride regions, concentrations as high as 12.80 mg/L (surface water) and 14.12 mg/L (sub-surface water) - well above the recommended value of 1.50 mg/L for drinking water set by the World Health Organisation (WHO) - were found in these drinking water resources. Previous reports suggested that the contamination was due to the intrusion of fluoride-rich thermal waters from a nearby hot spring into the surface and sub-surface water systems. Our data verified this for the northern part of our study area. Fluoride-rich waters emerging from the hot spring mix with the nearby streams and are transported south-westerly by stream water. Sub-surface waters with high fluoride concentration also show similar spatial distributions i.e. aligned along the fluoride-contaminated streams. For the southern part of the study site, fluoride-rich waters are mainly found in samples collected from deep wells, trending linearly in the northeast-southwest direction. This could be due to the presence of a fault line within the deep aquifers which facilitates the upwardly intrusion of fluoride-rich thermal waters, possibly derived from the dissolution of biotite in the underlying granitic bedrock, into the groundwater system.

Key words: fluoride, drinking water resources, Northern Thailand

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