

GRAND JUNCTION GEOLOGICAL SOCIETY

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MARCH MEETING

WEDNESDAY, MARCH 25, 2020

Joint meeting with the CMU Geology Students

7:30 PM

Sacomanno Lecture Hall

(In the Wubben-Science Building)

Richard (Rick) G. Warren

Comprehensive Volcanic Petrographics LLC

Grand Junction, CO

Will Speak On

“Quantitative Petrographic Analysis of Volcanic Rocks”.

Guests Are Always Welcome

Abstract on Next Page



20/20 VISION
TURN HINDSIGHT / TO FORESIGHT

ROCKY MOUNTAIN SECTION AAPG MEETING
SEPTEMBER 13-16, 2020
TWO RIVERS CONVENTION CENTER, GRAND JUNCTION, CO.

COHOSTED BY:
THE GRAND JUNCTION GEOLOGICAL SOCIETY
& THE FOUR CORNERS GEOLOGICAL SOCIETY

www.msaapg2020.com

Quantitative Petrographic Analysis of Volcanic Rocks

R.G. Warren

To characterize geology of vast, primarily rhyolite Southwestern Nevada Volcanic Field, Frank Byers applied quantitative petrographic analyses of volcanic rock to support extensive field mapping and lithologic logging of drill holes. Los Alamos geochemists added trace element analyses by neutron activation and X-ray diffraction analyses, and I joined Frank's supporting quantitative petrographic analyses, adding reflected light optics and developing methods to analyze trace components. Documentation of each individual component used in such analyses, plus electron microprobe analysis of these components enables accurate identification and fingerprinting of minerals. Views of components, paired in transmitted and reflected light, will illustrate important characteristics of rhyolitic volcanic rocks, particularly effects of alteration, their mode of fragmentation into shards, pumice, and hydroclasts, and evidence for frequent injection of primitive magma. Together with additional field mapping and Ar/Ar age dating by USGS, this body of work has defined more than 350 Miocene volcanic units within the volcanic field. Isotopic analyses by Lang Farmer and students established that injection of primitive magma triggered eruption of voluminous ignimbrite eruptions; plots of chemical plus quantitative petrographic analyses versus Ar/Ar ages show that such injection occurred far more extensively. Additional discoveries include history of resurgence of Timber Mountain Dome and extent of buried pre-Timber Mountain caldera. These data are served online at <http://www.pggdb-swnvf.lanl.gov/> .