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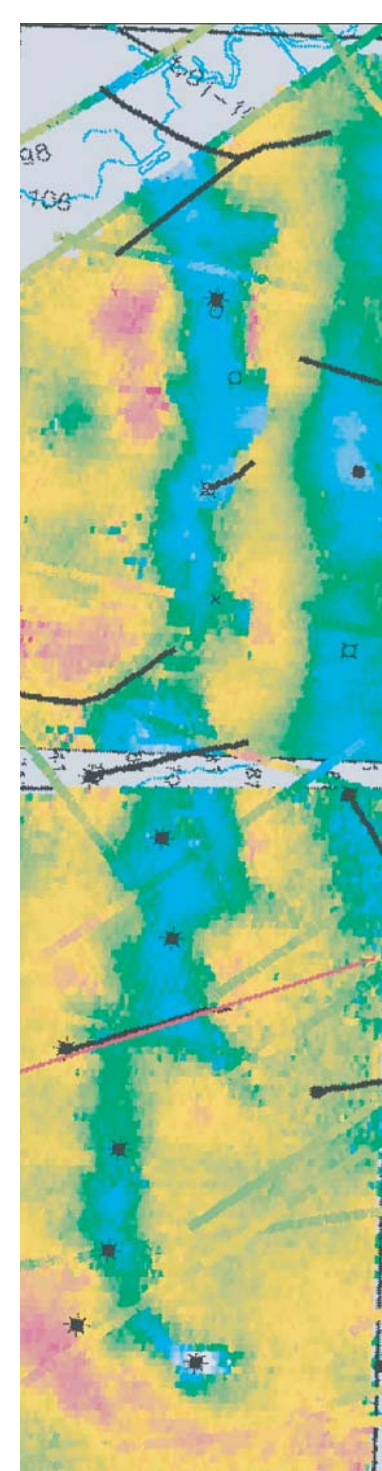
ABSTRACT

Geochemical analysis and field relations of linear dolomite bodies occurring in outcrop in the Mohawk Valley of New York suggest that they have undergone significant fault-related hydrothermal diagenesis. This study uses fluid inclusions, stable isotopes, 3D-ground penetrating radar, core analysis, and surficial observation which all show a link between faulting, dolomitization, and other hydrothermal alteration. The outcrop is a scaled analog for Trenton - Black River hydrothermal dolomite reservoirs of the eastern United States.

The dolomite occurs in the Lower Ordovician Tribes Hill Formation, which is regionally an early Ordovician shaley limestone with patchy dolomitization. The outcrop has an echelon fault, fracture and fold pattern. A 3D ground penetrating radar survey of the quarry floor has helped to map out faults, fractures, anticlines, synclines and the extent of dolomitization. Most of the dolomitization occurs in fault-bounded synclines or "sags" flanked by anticlines. The dolomite structures are highly localized, occurring around faults and are absent away from the faults and fractures. Trenches cut across the outcrop help relate offset along faults to the overall geometry of the dolomitized bodies. Geochemical analysis, though helpful in characterizing the conditions of dolomitization, does not define its origin absolutely. Although the outcrop is much too small and shallow to act as a producing gas field, it may be studied as a scaled analog to help petroleum geologists characterize existing gas plays and prospect future areas of exploration.

QUESTIONS WE HOPE TO ANSWER ABOUT TRENTON / BLACK RIVER FIELDS

1. What is the orientation of stresses that produce these long, linear, en-echelon bodies?
2. What is the relationship between the distribution of breccias, vuggy porosity, open fractures, and mineralization?
3. What regions of these bodies are likely to have the highest porosity and permeability?
4. What drilling techniques would be most effective in discovering and producing these highly localized features?



ACKNOWLEDGEMENTS

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Fortuna Energy Inc.

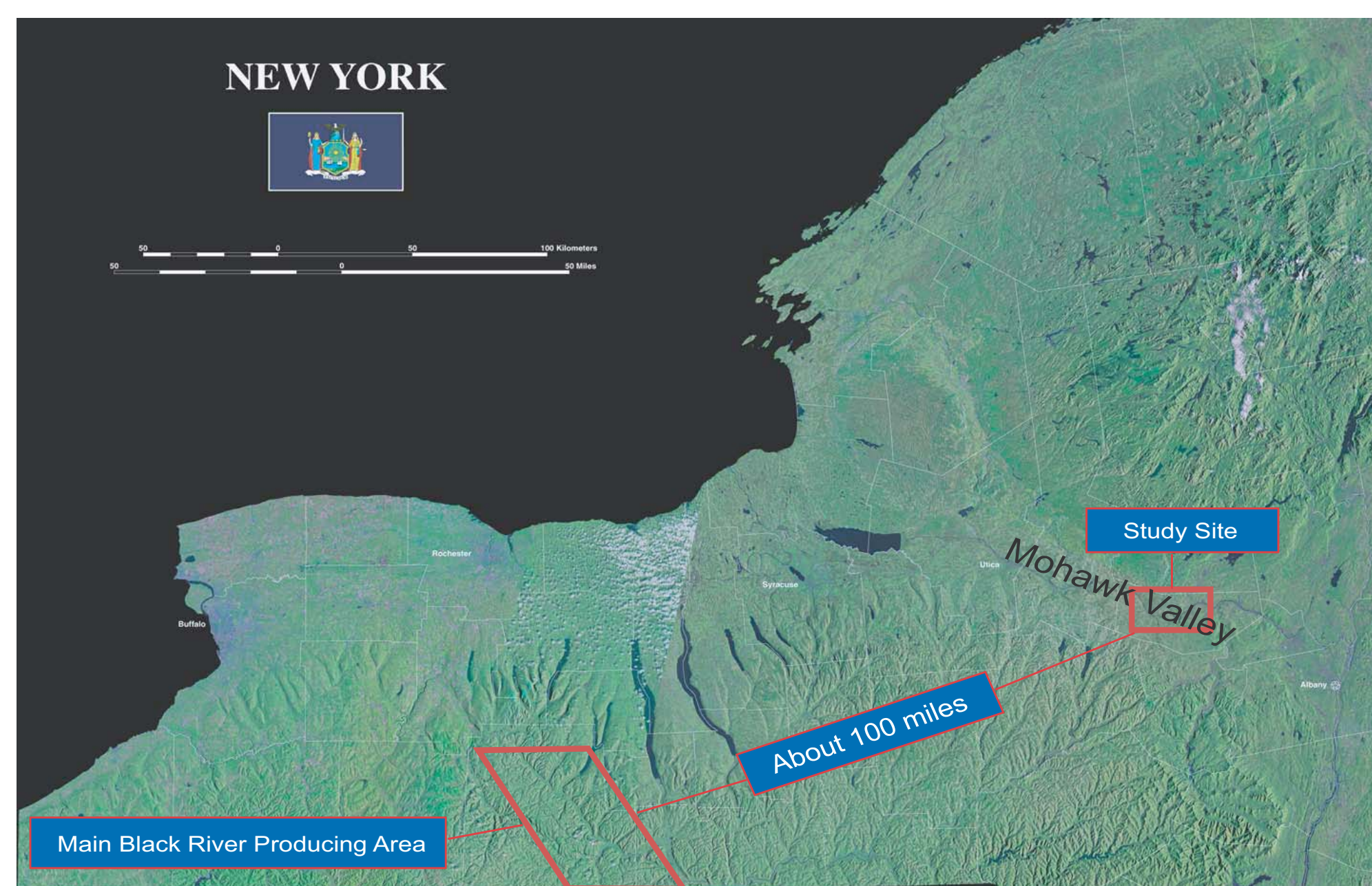


INTRODUCTION

New York is currently experiencing a natural gas boom with the discovery and development of more than 15 new hydrothermal dolomite reservoirs in the Ordovician Black River Group in south-central New York. Hydrothermal dolomite reservoirs are complex integrated structural-stratigraphic-diagenetic plays that have much in common with MVT carbonate hosted ore deposits. While the link between faulting and mineralization has been convincingly demonstrated, there are many details of the process and products that are poorly understood.

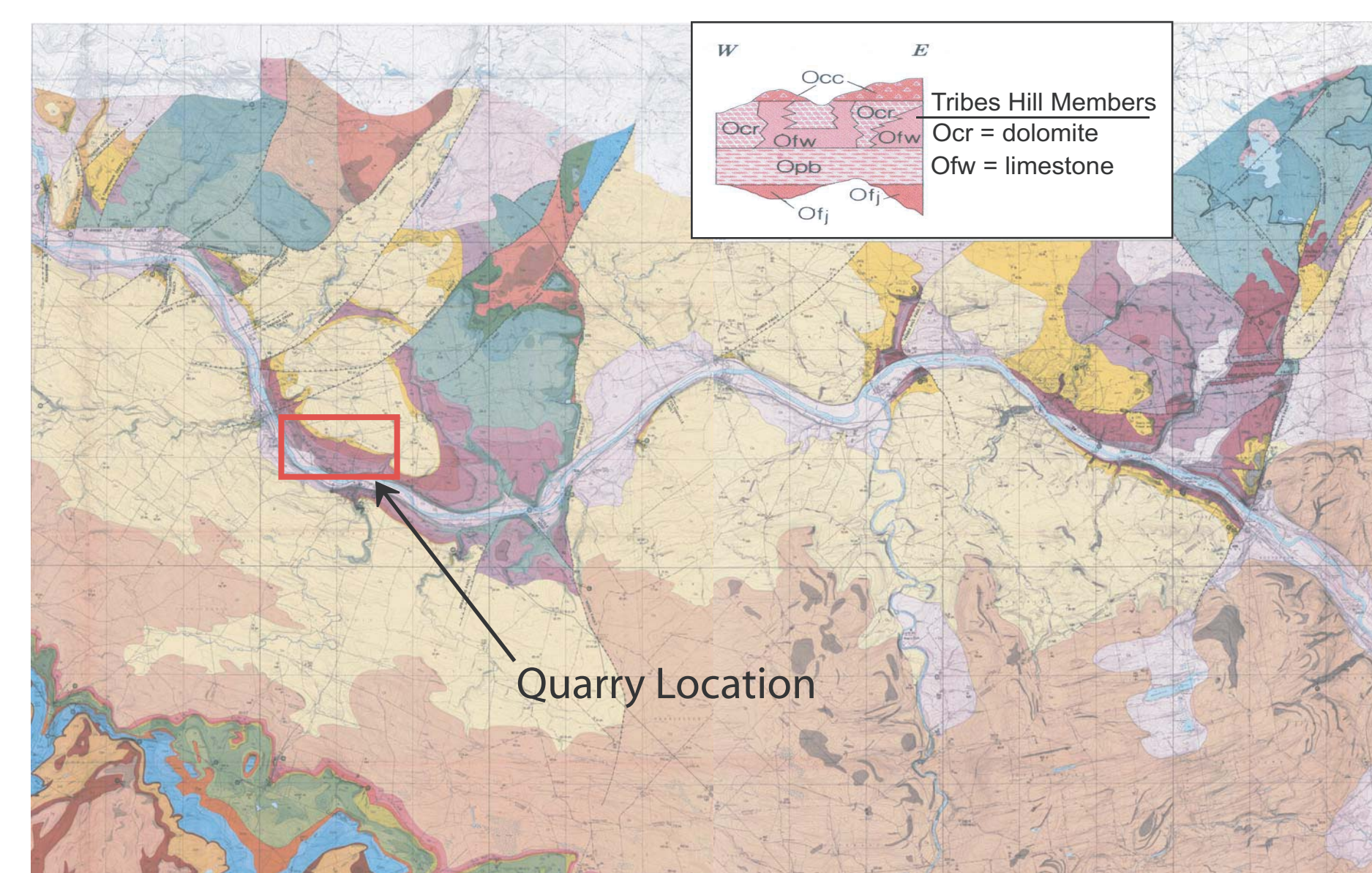
The outcrop study presented here is a work in progress, but it promises to show a convincing link between faulting, fracturing, folding, fluid flow, brecciation, dolomitization, and other mineralization. The dolomitized portion of the outcrop has proportions similar to the New York fields and to those of well studied dolomite reservoirs such as the Albion-Scipio Field in Michigan.

LOCATION



The study area is located in Palatine Bridge, roughly 100 miles north east of the main Black River producing area.

Mohawk Valley Bedrock Geology Map (Fisher, 1980). Several Late Ordovician-aged NNE-SSW trending normal faults with up to 200m of throw cut through the Mohawk Valley. The quarry is in the Tribes Hill Formation which Fisher noted has patchy dolomitization



Period	Group	Unit	Lithology
Ordovician	Upper	Queenston Sst	[Dotted pattern]
		Lorraine Siltst	[Horizontal lines]
	Black River	Trenton Lst	[Vertical lines]
		Black River Lst	[Horizontal lines]
Lower	Beekmantown	Tribes Hill Lst	[Vertical lines]
		Theresa Sst	[Horizontal lines]
Cambrian	Upper	Little Falls Dol	[Dotted pattern]
		Potsdam Sst	[Dotted pattern]
Precambrian Basement			[Dotted pattern]

Stratigraphically, the study site is located in the Upper Beekmantown Group, Tribes Hill Limestone. It is unconformably overlain by the Trenton and Black River Groups which are well known for their prolific gas production



A panoramic view of the Palatine Bridge Quarry study site (taken from the south looking north).