

Colorado



Geologic Maps Delineate Sand and Gravel Resources

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Defining the Problem

As population and urban **development** have **escalated** along the Colorado River valley in Garfield County, Colorado, the **demand** for sand and gravel resources has **increased** dramatically (Fig. 1). Sand and gravel are the basic materials used in most construction projects from roads and bridges to house foundations and office buildings. For example, construction of a small house requires an average of 250 tons of rock material. The relatively high cost to transport sand and gravel necessitates that these resources be obtained as close to where they will be used as possible.

The Geological Map

Geologic maps of the Colorado River valley (Fig. 2) show both bedrock and surface units. All of the geologic maps include descriptions of the unconsolidated sand and gravel units (yellow) as well as wind-blown deposits (loess) (yellow with black dots). Bedrock in the areas includes sedimentary rocks of the Tertiary Wasatch Formation (orange) and the Cretaceous Mesaverde Group (green).

Applying the Geologic Map

Geologic maps were the necessary starting point for **delineating** and characterizing sand and gravel resources in a study area. Field observations and map descriptions were used to group surface deposits according to their sand and gravel **resource** potential. Areas of high, good, moderate, and low sand and gravel resource potential were identified and outlined (Fig. 3). High potential sand and gravel areas, Category 1, include recent stream alluvium and terrace gravel characterized by moderately well-sorted, slightly bouldery, pebble- and cobble-gravel in a sandy or silty matrix. Good **potential** sand and gravel areas, Category 2, include glacial deposits, stream alluvium and terrace gravels in tributary drainages, and Colorado River terrace gravel. Moderate potential sand and gravel areas, Category 3, include pediment deposits, older mud-flow and debris-flow deposits, and some alluvial-fan deposits that contain volcanic pebbles and cobbles. Low potential sand and gravel areas, Category 4, include alluvium in some drainages tributary to the Colorado River, some alluvial-fan deposits, and modern debris-flow deposits.

Fig. 1. The flat areas adjacent to the Colorado River are underlain by thick gravel deposits.



Conclusion

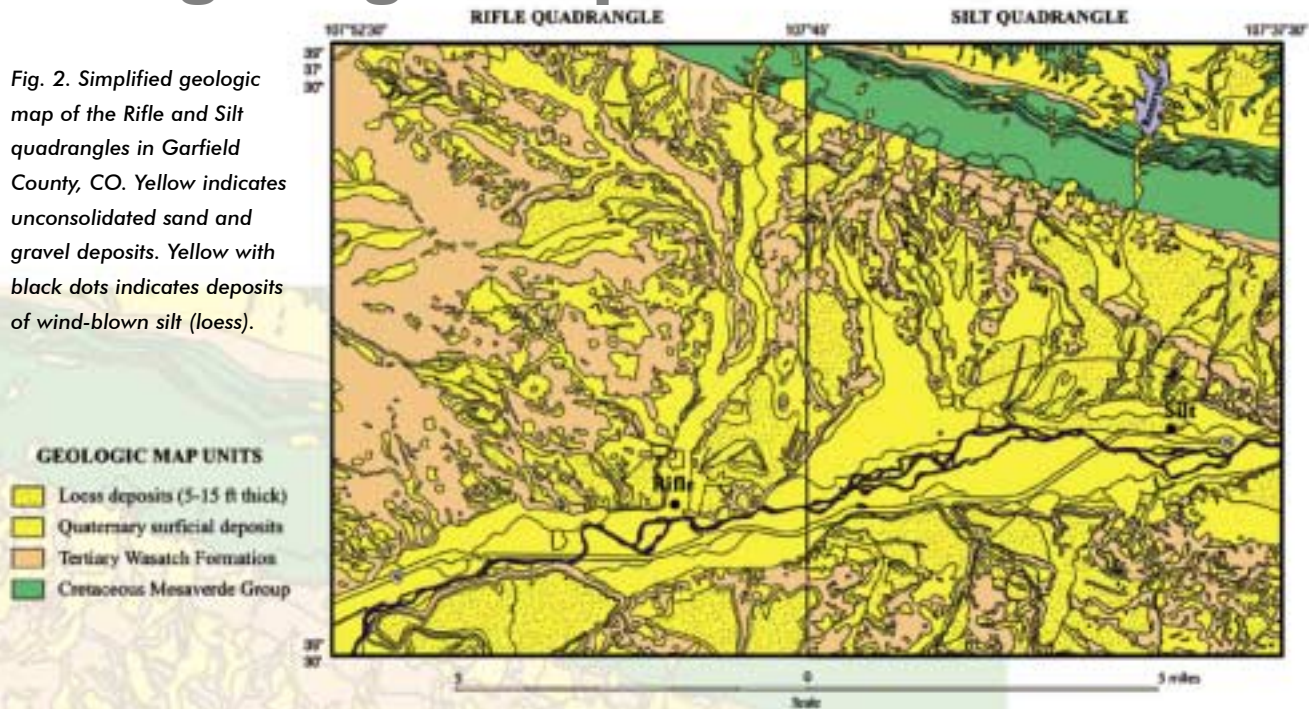
In Garfield County, an area of multiple land uses, geologic maps show the location and quality of the sand and gravel resources. Planners, citizens, and resource developers use this information to **locate** and **evaluate** potential **deposits** and make informed land-use choices.

Construction of a small house requires an average of 250 tons of sand and gravel.



geologic map

Fig. 2. Simplified geologic map of the Rifle and Silt quadrangles in Garfield County, CO. Yellow indicates unconsolidated sand and gravel deposits. Yellow with black dots indicates deposits of wind-blown silt (loess).



resources map

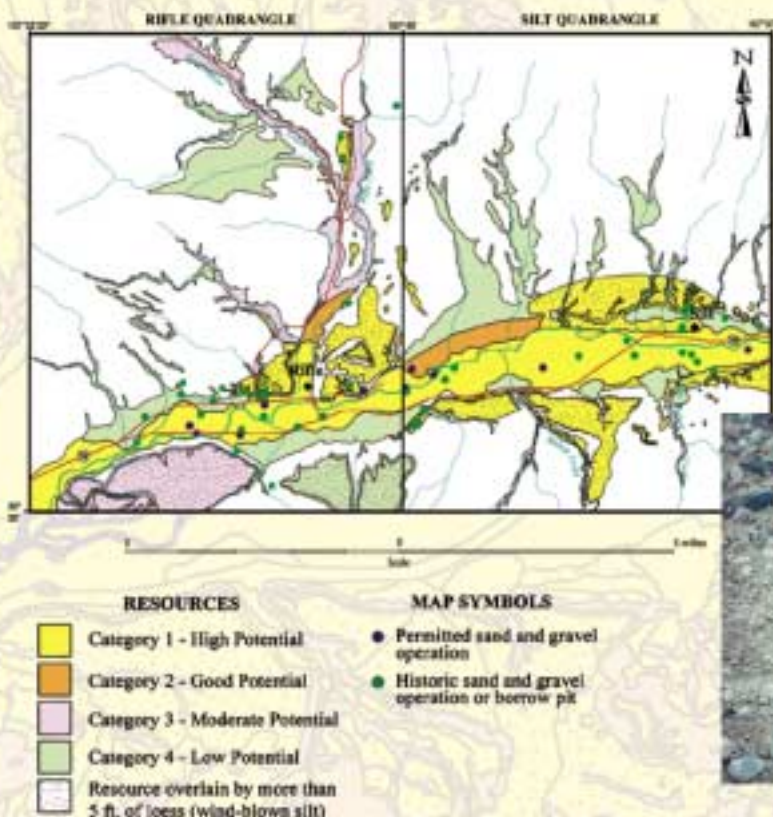


Fig. 3. High potential sand and gravel resources of the Rifle and Silt quadrangles in Garfield County, CO, (yellow) include recent stream alluvium and terrace gravels. Good potential sand and gravel areas (orange) include glacial deposits, stream alluvium and terrace gravels in tributary drainages, and Colorado River terrace gravel inundated with locally derived material.



References

Shroba, R.R. and R.B. Scott, 2001. *Geologic map of the Silt quadrangle, Garfield County, Colorado*. U.S. Geological Survey Miscellaneous Field Studies Map MF-2331, scale 1:24,000.

Shroba, R.R. and R.B. Scott, 1997. *Geologic map of the Rifle quadrangle, Garfield County, Colorado*. U.S. Geological Survey Open-File Report OF 97-825, scale 1:24,000.

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