

## **Aggregate, the building blocks of society**

**By Chamois Andersen, Wyoming State Geological Survey (Spring 2015)**

As the saying goes, “money makes the world go ‘round.” But in a society that requires roads to go places, houses to live in and buildings for work and school, it might actually be construction aggregate that makes the world go ‘round. From crushed stone to sand and gravel, aggregates are used in our everyday lives.

The WSGS has a new report on Wyoming’s Construction Aggregate Resource. Aggregate mining operations occur throughout the state and include granite, limestone, sand, gravel and scoria, or clinker. This four-page, color summary includes production numbers and values as well as information on the history and geology of aggregate. A map on the back cover illustrates the aggregate resources found throughout the state.

“This summary is a snapshot of the construction aggregate industry,” says Suzanne Luhr, WSGS map editor and author of the report. “There are a number of agencies tracking construction aggregate produced in Wyoming, and as with any commodity, supply and demand determines how much of the resource is produced.”

The U.S. Geological Survey estimates Wyoming produced more than 21 million metric tons of construction aggregate in 2014, valued at \$142 million. Although ranking fourth in terms of tax dollars to the state, after oil and gas, coal and trona, construction aggregate produced in 2013 provided \$3.3 million in taxes to state coffers. A total of 21 million metric tons was produced in 2013 with a value of \$143 million. In most cases, construction aggregate is mined close to the site where it is used. This is a cost benefit to industry. “Moving or transporting aggregate, even a short distance, can cost more than the actual product,” Luhr says.

Based on the average life span, the nation’s population, and total aggregate production, WSGS estimates every American will use 1 million pounds of stone, sand, and gravel in their lifetime. As with many of the earth’s minerals, aggregate can be used for a variety of purposes, from consumer products such as paint, paper and glass, to infrastructure, roads, sidewalks and bridges.

Wyoming’s diverse geology has provided for a plentiful resource for the state. “With Wyoming’s relatively low population, keeping up with the demand of human development is not such an issue as with other more populous states,” Luhr says. “Cooperative planning by aggregate producers, government agencies, and residents can ensure that aggregate remains available and affordable in Wyoming well into the future,” she adds.

Wyoming primarily uses its aggregate resources for roadways and buildings. It is used in its natural form for foundations and buildings, as gravel for railroad ballast, erosion control, and as an additive for concrete and asphalt. A large portion of Wyoming’s aggregate resource is used for building roadways and for the maintenance of more than 48,000 miles of existing roads and highways.

“Without aggregate, there would be no railroads or highways,” Luhr says. Prior to the automobile, it was the railroad that provided people with such major transportation. The building of the Transcontinental Railroad across Wyoming required large amounts of construction aggregate. This had a ripple effect on the local economy and workforce. Towns along the way required a brick factory and many had a stone quarry. The railroad also provided jobs to local workers. Later in history, in the 1960s and 1970s, construction of the Dwight D. Eisenhower National System of Interstate and Defense Highways required the extensive use of construction aggregate. Nearly 1,000 miles of interstate highways were built in Wyoming, every mile containing nearly 38,000 tons of aggregate, as noted by the National Stone, Sand and Gravel Association.

The use of natural aggregate dates back to the Roman Empire (750 BC). Roman concrete, or *opus caementicium*, was used as cement for brick facades and later to make roads. As the saying goes, “all roads lead to Rome.”