Sustainable Mining Practices - Recycling Concrete and Asphalt

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Recycling –Not Just for Bottles and Cans

As we look for more ways to reduce, reuse, and recycle, we’re finding that the same principles already being applied to recycling beverage bottles and cans should be applied to many of the other materials we use. This includes many construction and demolition (C & D) materials, which make up an estimated 22 percent of California’s waste stream. Approximately 80% of all asphalt removed from roads in California is currently being recycled, a figure comparable to the recycling rate for bottles and cans. But with 100% potentially recyclable and reusable, our rate of reusing asphalt still has room for improvement.

Many California mine operators help keep these materials out of landfills by crushing millions of tons of used concrete and asphalt salvaged from demolished infrastructure (roads, parking lots, buildings, etc.) to create recycled aggregates. When recycling asphalt, materials from other sources - such as rubber from used tires, asphalt roofing shingles, and blast furnace slag – are routinely recycled into the pavement mix. According to current information from CalRecycle, there are about 100 producers of recycled aggregate in California today. This recycled aggregate is in high demand for a variety of applications.

Where the Rubber Hits the Road

For each mile of road constructed, tons of rock, concrete, asphalt, and steel are needed. For example, each mile of a two-lane asphalt road constructed requires up to 25,000 tons of aggregate rock.

Most recycled concrete is used for road base and most recycled asphalt (called “RAP” for recycled asphalt pavement) is returned to the roadway structure in some form. The state and federal highway agencies have adopted policies and standards to promote the use of reclaimed materials (see links below). In an effort to make roads of the future more “green”, experiments are being undertaken adding other materials to repave our highways, such as recycled rubber tires.

Local governments are also encouraging the use of more recycled asphalt, concrete, and aggregate. For example, since 1995 the City of Los Angeles has required that road materials in all city projects must include 100 percent recycled asphalt or concrete. Palo Alto likewise requires that any concrete or asphalt in City projects be recycled.
Benefits of Recycled Materials

Recycling asphalt and concrete has additional benefits. Using recycled aggregates instead of mining new materials conserves the reserves of natural materials already known to be inadequate to meet the future demands of our growing population in nearly every county of the state. This practice helps to make mining into the future more sustainable. Using locally recycled material cuts down on transportation costs plus reduces the associated greenhouse gas emissions and wear and tear on roads. These recycled materials provide a high quality construction resource rather than being disposed of as waste in landfills.

Summary of the benefits of recycling concrete and asphalt:

- Conserves diminishing resources
- Helps meet demand for new, local infrastructure
- Creates new business opportunities and jobs
- Saves money for local governments
- Keeps materials out of landfills
- Cuts transportation costs
- Reduces energy use
- Reduces greenhouse gases

In the foreground, salvaged concrete and asphalt rubble are ready for recycling at an aggregate quarry in Napa County.
Useful links for more information:

Department of Resources Recycling and Recovery (CalRecycle):

http://www.calrecycle.ca.gov/condemo/Aggregate/default.htm

Cal Construction and Industrial Materials Association (CalCIMA):

http://www.cmac-ca.org/

Construction Materials Recycling Association: http://www.concreterecycling.org/

Asphalt Recycling and Reclaiming Association: http://www.arra.org/

Recycled Materials Resource Center: http://www.rmrc.unh.edu/

Cal Dept. of Transportation (CalTrans): http://www.dot.ca.gov/

US Dept. of Transportation Federal Highways Administration: