

**Sand, Gravel and Stone.  
Industrial Minerals in Saskatchewan**

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## Industrial Minerals in Saskatchewan: Sand, Gravel and Stone

### *Sand and Gravel*

Being stuck behind a large, dusty gravel truck is a common and frustrating experience on Saskatchewan roads. Next time this happens to you, relax and think about how important these trucks are to us: in fact, without them, we wouldn't have roads to drive on!

Saskatchewan sands and gravels with potential for commercial development occur mainly as glacial outwash deposits in the southern half of the province. In eastern Saskatchewan, extensive glacial beaches contain important aggregate deposits. Preglacial sand and gravel sources occur in the Pilot Butte, Cypress Hills, Swift Current and Wood Mountain areas. More recently deposited gravels are harvested from river terraces in many locations.

The lowly sand and gravel pit is actually one of the most valuable industrial mineral resources on the prairies. The extraction of sand and gravel, on small and industrial scales, has been going on for a very long time, with hundreds of pits across the southern half of the province, including many on First Nations reserve lands. Quarrying, crushing and delivery of sand and gravel have been important sources of income for individuals, partnerships and large companies over the years. In Saskatchewan, sand and gravel extraction is not considered to be mining, *per se*. Sand and gravel are considered to be part of the surface of a property and therefore owned by the landowner and available for his use.<sup>1</sup> Between 1998 and 2000, there were 19 companies, with a total of 183 employees, involved in sand and gravel extraction.<sup>2</sup> Because quarrying has been going on for a long time, new economically viable sources are becoming more difficult to find by traditional aerial photographic methods. A successful experiment conducted in Saskatchewan has demonstrated that resistivity surveying is a faster, cost effective and accurate method of finding and mapping aggregate deposits hidden below the surface.<sup>3</sup>

Saskatchewan consumes essentially all the sand and gravel it produces. In 2001, the province produced about 11,700,000 tonnes, valued at almost \$45 million,<sup>4</sup> a value greater than for any other Saskatchewan mineral product except uranium and, possibly, potash. The product is used mainly in road construction, but is also important as aggregate component of asphalt and concrete, ground fill, backfill in mines, ice control on roads, railway ballast, and mortar sand.<sup>5</sup> Others uses include metallurgical and non-metallurgical fluxes and filtration media.

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<sup>1</sup>“The owner of the surface of any land is and shall be deemed to have always been the owner of and entitled to all sand and gravel on the surface of the land and all sand and gravel obtainable by stripping off the overburden, excavating from the surface or other surface operation.” The Sand and Gravel Act, R.S.S.1978, C.S-5, s.3., paragraph 3. Saskatchewan. 1978.

<sup>2</sup> Statistics Canada, Manufacturing, Construction and Energy Division, “Non-metallic Mineral Mining and Quarrying, 2000,” Catalogue No. 26-226-XIB, 2002. Page 16, Table 2.

<sup>3</sup> Fugro Airborne Surveys, “Airborne Resistivity Mapping of Sand and Gravel Using DIGEM,” [http://www.fugroairborne.com/services/applications/eng\\_downloads/RES\\_SAND\\_GRAVEL.pdf](http://www.fugroairborne.com/services/applications/eng_downloads/RES_SAND_GRAVEL.pdf)

<sup>4</sup> Values are greater than those of gold, salt, sodium sulphate and copper. The statistics for potash have been withheld, for confidentiality. Statistics Canada, Manufacturing, Construction and Energy Division, “Canada’s Mineral Production: Preliminary Estimates 2001,” Catalogue No. 26-202-XIB, 2002. Page 10, Table 1.

<sup>5</sup> Ibid.

## Stone

Stone has been used in construction, weapons manufacturing, ceremonial and artistic works, and even cooking for thousands of years in Saskatchewan. Various stone materials have been used, including petrified wood, sandstone, chert (a glassy flint-like silica material which flakes easily in making sharp edged tools), quartz, quartzite and siltstone. Archaeological sites in the Athabaska Sand Dunes contain evidence of the use of stone for tool manufacturing over some 7000 years. In central Saskatchewan, sites such as the “Below Forks” tool manufacturing site contain thousands of chert fragments.<sup>6</sup> Swan Lake and Knife River chert, found by ancient First Nations people and the later bison hunters in glacial deposits was frequently used for making spearheads, arrowheads, hide scrapers, drills and knives. Where chert cobbles were rare, trade networks ensured that this essential resource found its way from distant quarry sites. Volcanic obsidian, traded from the south, has also been found in Saskatchewan.

During the early years of the province, stone was cut and used by settlers for houses and barns, and piled for fences. Limestone was burned for the making of lime plaster. At the University of Saskatchewan, local “greystone” and pinkish Silurian limestone were used to make the first buildings.<sup>7</sup> Today, most stone is used in the construction industry. Some stone is also consumed by monument industries. Since a large area of the province is represented by the Precambrian Shield, granite and marble resources are plentiful. Many beautiful buildings in the province feature Saskatchewan granite.<sup>8</sup> With modern methods of quarrying, block and thin cutting, polishing and application, the potential for the province is great. Exploration and structural and economic evaluation of several granites continues in the La Ronge, Creighton and Pelican Narrows regions.<sup>9</sup> Research continues into finding granites with low microfracture qualities. Especially tantalizing is a green granite of potentially high value.

Colourful new Saskatchewan marble and granite products are appearing in local markets but have not yet made their way onto the national scene. Beautiful marbles in red, green, grey and buff colours are being quarried in the Pelican and Amisk Lake areas. Blocks of dolomite, a metamorphosed limestone, quarried from the Red River Formation near Deschambault Lake, were used in the Agriculture and other buildings at the University of Saskatchewan and have also been exported.<sup>10</sup> Sandstones of various hardness are also widely used in construction.

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<sup>6</sup> Ensz, Greg. “Meyer Digs for Saskatchewan’s Ancient History.” *OnCampus News* 8(3) September 29, 2000. University of Saskatchewan, <http://www.usask.ca/communications/ocn/sept29-00/feature5.shtml>

<sup>7</sup> “The . . . limestone was found approximately five miles north of the campus on the south side of the Saskatchewan River near Clarksboro. . . the large boulders were brought to the campus and roughly hued by stone masons on site.” University of Saskatchewan, [http://scaa.usask.ca/gallery/uofs\\_buildings/](http://scaa.usask.ca/gallery/uofs_buildings/)

<sup>8</sup> Panels made from blocks of Sahli Lake green granite were used in a feature wall at the new North Battleford courthouse. Saskatchewan Industry and Resources, “Mineral Resources of Saskatchewan,” *Granite*, <http://www.ir.gov.sk.ca/default.aspx?DN=3566,3547,3541,3538,3385,2936,Documents>

<sup>9</sup> Saskatchewan Industry and Resources, “Mineral Resources of Saskatchewan,” *Building Stone*, <http://www.ir.gov.sk.ca/Default.aspx?DN=3547,3541,3538,3385,2936,Documents>

<sup>10</sup> Saskatchewan Industry and Resources, “Mineral Resources of Saskatchewan,” *Marble*, <http://www.ir.gov.sk.ca/default.aspx?DN=3567,3547,3541,3538,3385,2936,Documents>