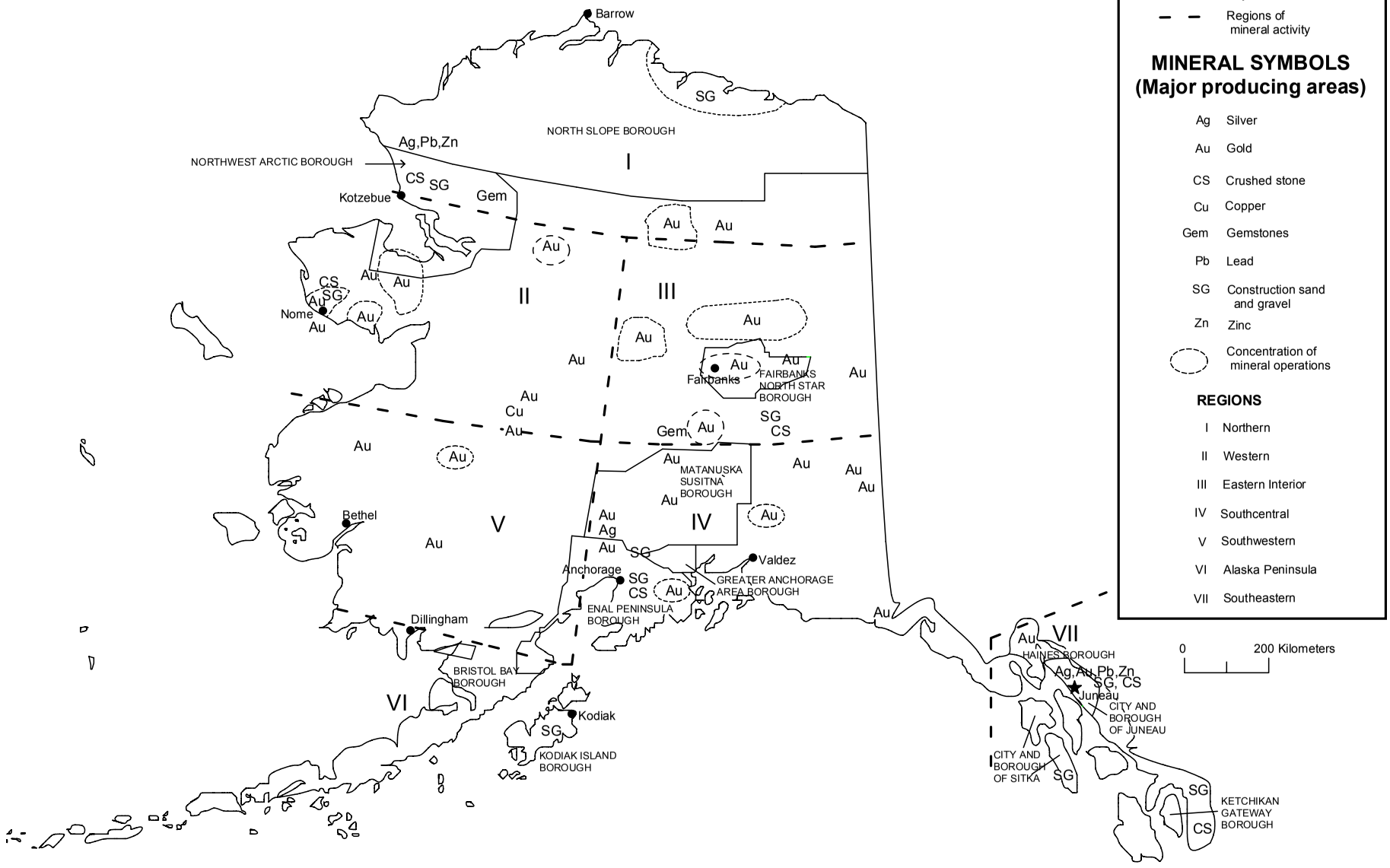
ALASKA



LEGEND

- Borough boundary
- Capital
- City
- Regions of mineral activity

MINERAL SYMBOLS (Major producing areas)

Ag	Silver
Au	Gold
CS	Crushed stone
Cu	Copper
Gem	Gemstones
Pb	Lead
SG	Construction sand and gravel
Zn	Zinc
	Concentration of mineral operations

REGIONS

I	Northern
II	Western
III	Eastern Interior
IV	Southcentral
V	Southwestern
VI	Alaska Peninsula
VII	Southeastern

Source: Alaska Division of Geological and Geophysical Surveys/U.S. Geological Survey (2002)

THE MINERAL INDUSTRY OF ALASKA

In 2002, the estimated value[1] of nonfuel mineral production for Alaska was about $1.03 billion, based upon preliminary U.S. Geological Survey (USGS) data. This was about a 5% increase from that of 2001[2] and followed an 11.4 % decrease from 2000 to 2001. The State was 13th in rank in 2002 (16th in 2001) among the 50 States in total nonfuel mineral production value and accounted for more than 2.5% of the U.S. total.

During 2002, metallic minerals accounted for nearly 94% of the State's total nonfuel mineral production value. A large majority of this was the result of zinc, lead, and silver production (descending order of value) at Teck Cominco Alaska Inc.'s Red Dog Mine, which is near Kotzebue in northwestern Alaska, and gold production from the Kinross Gold Corp.'s Fort Knox Mine, which is near Fairbanks in east-central Alaska. In 2002, most of the State's rise in nonfuel mineral value resulted from increases in most of the metal commodities. Gold led the way with the largest increase (table 1), while the higher values of lead, zinc, and silver (descending order of increase) combined for a total increase of about $33 million. Although zinc production and value increased, its prices remained relatively low. Construction sand and gravel had a small increase in production and value and all other commodities remained virtually the same.

In 2001, nearly all nonfuel minerals increased in value except for zinc; the base metal's value dropped by more than $100 million, because of low metal prices. Construction sand and gravel and lead were up by about $12 million each, gold was up $6 million, and crushed stone was up by about $1 million, while copper and silver were down slightly (table 1).

Based upon USGS estimates of the quantities produced in the 50 States during 2002, Alaska, as well as remaining first in zinc, rose to first from second in the Nation in the production and value of silver. The State continued to be second in lead and third of 10 gold-producing States.[3] Production of peat in Alaska was not reported to the USGS partly because of reporting difficulties associated with the seasonal, intermittent nature of the mineral commodity's mining in the State. The Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGS), estimated peat production to be about 26,800 cubic meters for an estimated value of about $175,000. Additionally, the DGGS reported production of jade and soapstone combined to be about 1.8 metric tons (t) at an estimated value of $25,000 (Swainbank and Szumigala, 2003).

The DGGS provided the following narrative information; the data are based on DGGS surveys and estimates (Swainbank and Szumigala, 2003). The total minerals industry employment in 2002 was estimated to be 2,700 full-time-equivalent jobs, a drop of about 140 jobs from the 2,840 jobs reported in 2001. Most of the decline was in the development sector, counteracted to some extent by an increase in the industrial minerals sector and lode gold mine employment. The largest mine employment in 2002 was in the sand and gravel industry (660), followed by the base-metals industry (560), and gold and silver lode mining (413). The Usibelli Coal Mine (UCM) laid off 30 of its 110 employees during 2002. The total amount of coal mined from UCM near Healy in 2002 was 1,050,000 t, considerably less than in past years. The reason for the decline was the expiration of its coal export contract with Korea Electric Power Corporation (KEPCO).

Exploration, Development, and Drilling Activities

Exploration expenditures increased from $24 million in 2001 to $25 million in 2002. Exploration during 2002 took place across most regions of the State, with almost half of the exploration funds spent in southwestern Alaska. Eastern Alaska was the next most active region, but expenditures dropped almost to half of 2001 levels. The Seward Peninsula experienced a rebirth in activity. More than $17 million was spent exploring on gold and associated precious-metal projects across the State. The largest exploration project in Alaska was NovaGold Resources' Donlin Creek gold property in southwestern Alaska. Other large projects were Northern Dynasty's Pebble project in southwestern Alaska, Kinross Gold's Fairbanks mining district exploration program, and Kennecott's

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2002 USGS mineral production data published in this chapter are preliminary estimates as of July 2003 and are expected to change. For some mineral commodities, such as construction sand and gravel and crushed stone, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Specialist contact information may be retrieved over the Internet at URL http://minerals.usgs.gov/minerals/contacts/comdir.html; alternatively, specialists' names and telephone numbers may be obtained by calling USGS information at (703) 648-4000 or by calling the USGS Earth Science Information Center at 1-888-ASK-USGS (275-8747). All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL http://minerals.usgs.gov/minerals.

[2]Values, percentage calculations, and rankings for 2001 may differ from the Minerals Yearbook, Area Reports: Domestic 2001, Volume II, owing to the revision of preliminary 2001 to final 2001 data. Data for 2002 are preliminary and are expected to change; related rankings may also change.

[3]Gold figures in table 1, as reported to the USGS, may differ with estimates made by the Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGS). The canvassing of gold placer mineral production was discontinued by the U.S. Bureau of Mines (the Federal agency responsible for U.S. nonfuel mineral production data collection from 1924-94) in 1994. Gold production and value data in table 1 contain data that will be further estimated by the USGS in cooperation with the DGGS. Current estimates based on data collected by the DGGS indicate the production quantity in 2000, 17,200 kg valued at $154 million; in 2001, 17,100 kg valued at $149 million; and in 2002, 17,400 kg valued at $174 million (Swainbank and Szumigala, 2003). The USGS final 1999-2001 total gold production and value data for Alaska, done in collaboration with the DGGS, will be published in the USGS Mineral Industry Surveys—Gold, 2002 Annual Review and in the subsequent Gold chapter in Volume I of the 2002 USGS Minerals Yearbook.

exploration program at Greens Creek Mine. As in years past, most exploration funds, more than 70%, were derived from Canadian sources.

News from the Donlin Creek gold project dominated Alaska's exploration sector during 2002. A new resource announced in early 2002 increased measured and indicated resources to 137,000 t of gold grading 5.21 grams per metric ton (g/t) and inferred resources to 193,000 t of gold grading 5.21 g/t. Total resources are 712,000 t of gold at an average grade of 3 g/t, ranking Donlin Creek as the 22nd largest gold deposit ever discovered in the world.

Kennecott Minerals continued exploration to expand ore zones at the Greens Creek Mine. Exploration remained focused on the silver-rich 200 South ore body, where new resources were identified in 2001 and 2002. Continued aggressive exploration during 2002 added to these resources, with new discoveries at Akivik Zone, Aurora Zone, and Far East Zone. During the 2002 program, NovaGold completed 347 drill holes (195 core holes and 152 rotary holes) for a total of 51,000 meters (m). This includes 39,000 m of core drilling and 12,000 m of rotary drilling in 2002.

Development expenditures plunged from $81 million in 2001 to $34 million in 2002. The decline in development investment mainly reflects completion of ongoing projects at Red Dog Mine in northern Alaska, but small projects were reported at the Fort Knox/True North complex, Usibelli Coal Mine, and Pogo in the interior and at Kensington and Greens Creek mines in southeastern Alaska.

Drilling was conducted during all phases of mining (exploration, development, and production) on various projects across Alaska during 2002. Preliminary drilling totals for 2002 were 122,000 m of core drilling and 32,800 m of reverse-circulation drilling. Hardrock core (sometimes referred to as hardrock diamond drilling) footage in 2002 was approximately 59% higher than the 73,300 m reported drilled in 2001. Reverse-circulation drilling footage also increased approximately 42% higher than the 23,100 m reported drilled in 2001. Hardrock core footage for 2002 was approximately 11% lower than the average core footage reported in Alaska from 1996 to 2001. Reverse-circulation drilling footage for 2002 was equal to the average reverse-circulation drilling footage from 1996 to 2001. Drilling at placer mines was largely unreported for 2002, with 380 m reported to date. Major drill programs were conducted by NovaGold Resources Inc. at the Donlin Creek deposit, by Northern Dynasty Minerals Ltd. at the Pebble property, by Chapleau Resources Ltd. at the Kougarok property, by Kinross Gold Corp. in the Fairbanks mining district including Fort Knox and True North Mines, by Teck Pogo Inc. at the Pogo property, and by Kennecott Minerals Co. at Greens Creek Mine.

Navigator Exploration Corp. and Chapleau Resources Ltd. planned a minimum $600,000 drilling program on the Kougarok tantalum–tin prospect in the north-central Seward Peninsula, which is approximately 110 kilometers (km) north of Nome, AK. The Kougarok property appears to be underlain to 210 m. The program confirmed the presence of a large, well-preserved, tantalum-bearing granitic system. Given current (2002) tantalum prices, however, the economic potential of the deposit appears limited.

Commodity Review

Industrial Minerals

Production of sand and gravel in 2002 was, at a minimum, 16.4 million metric tons (Mt). Most of the use was for scheduled roadwork in south-central and interior Alaska, but flooding on the Kenai and major earthquake damage in the eastern interior required major road repairs late in the year. As usual, there was a large amount of sand and gravel used in the North Slope oilfields.

Demand for crushed stone declined sharply from past years to only about 1.3 Mt, with most of the decline in southeast Alaska because the U.S. Forest Service was not constructing many roads.

Metals

Production was robust at the Red Dog Mine and the Fort Knox Mine and reached record levels at the Greens Creek Mine. The Red Dog and Greens Creek mines, the primary producers of zinc and lead concentrates, also produced silver. Gold production was reported from Fort Knox, Greens Creek, and Illinois Creek hard rock mines, and at least 40 placer mines. Placer gold production levels were comparable to those of previous year and are expected to increase in 2003 corresponding to the rising price of gold. With a workforce of 262 people, Kennecott Minerals Co. milled a record 665,000 t of ore from its Greens Creek Mine in 2002, up 11.5% from the 597,000 t milled in 2001. Head grade of the ore was 12.52% zinc, 4.73% lead, 676 g/t silver, and 7 g/t ton gold. The concentrate contained 72,900 t of zinc, 25,000 t of lead, 339 t of silver, and 3,190 t of gold. At the beginning of 2003, the proven/probable reserve stood at 6.4 Mt of 11.4% zinc, 4.2% lead, 511 g/t silver, and 4 g/t gold. Other resources were 2.4 Mt at 11.3% zinc, 4.9% lead, 583 g/t silver, and 4 g/t gold.

Gold.—Fairbanks Gold Mining Inc. (FGMI) (a subsidiary of Kinross Gold Corp.) is the operator of Fort Knox Mine and the satellite True North Mine about 40 km north of Fairbanks. During 2002, with a workforce of 360, FGMI recovered 12.8 t of gold from 13.8 Mt of ore milled. The ore was derived from 10.4 Mt mined at True North and 22.2 Mt mined at Fort Knox.

American Reclamation Group LLC. continued leaching gold from 349,000 t of ore added to the existing heaps at Illinois Creek Mine and conducted a limited exploration program designed to prospect for the northward extension of the vein in the East Pit. The mine employed workers, many of whom are from the nearby villages of Ruby, Galena, Huslia, Kaltag, and Nulato.

Production from about 40 placer gold mines was about 622 kilograms (kg), slightly less than the 710 kg reported in 2001. The decline was the least in more than 4 years, and with a significant increase in the price of gold late in the year, placer gold production is expected to increase next year.

Zinc, Lead, and Silver.—At Red Dog Mine near Kotzebue in northwestern Alaska, 3,170,00 t of ore was milled, down 64,000 t from the year before. However, the Mill Optimization Project of past years resulted in production of a record 1,240,000 t of concentrate with 579,000 t of contained zinc and 108,000 t of contained lead and an estimated 210 t of silver. The ore grade was 21% zinc, 5.4% lead, and 93 g/t silver. Despite the higher grade of ore and better recovery, the average price of zinc in 2002 ($0.35 per pound) was so much lower than the 2001 average ($0.40 per pound) that the mine reported a loss of $28 million for the year. In July 2002, Red Dog employed 521 regular employees and 59 temporary or casual employees for a total of 580. Of these, 59% were shareholders of the NANA Regional Corp.

Government Programs, Activities, and Reclamation Awards

The DGGS conducted a regional geologic mapping project in the Salcha River–Pogo geophysical tract within the Big Delta Quadrangle. Geologic mapping and geochemical sampling were conducted in a 60-day program stretching from the Salcha River near Caribou Creek to the Goodpaster River drainage near the Pogo gold property.

Airborne geophysical surveys funded by DGGS were flown in the Council area east of Nome. DGGS also released results of surveys from three areas flown in 2001: in the area southeast of the Pogo deposit, in the Broad Pass area south of Cantwell, and in the Bonnifield district east of Healy.

Geophysical surveys funded by the Bureau of Land Management (BLM) and managed by DGGS were flown in the Denali Block west of Paxson and in the Red Devil–Sleetmute area of southwestern Alaska. Existing company data were incorporated into the Denali Block data.

Also in 2002, 95,100 hectares (ha) of the strategic Denali Block area, containing some of the best copper–nickel–platinum-group-elements targets, were tentatively approved for transfer to the State of Alaska.

DGGS conducted approximately 60 days of fieldwork in the Salcha River–Pogo area during 2002. Geologic maps covering approximately 109,000 ha in the area will be published in June 2003.

The U.S. Geological Survey (USGS) conducted studies for several years on the Red Dog deposit. Recent results include a possible regional exploration tool for "Red Dog-type" massive-sulfide mineralization in Pennsylvanian Kuna shale. Geochemical indications of mineralization include greater than 2 parts per million (ppm) germanium, greater than 1.2 ppm thallium, greater than 45 ppm arsenic, and greater than or equal to 20 ppm antimony.

During the last two summers, USGS and Calista Native Corp. geologists collected geochemical samples in southwestern Alaska in conjunction with the National Geochemical Survey, a nationwide program designed to establish baseline chemical data in the geologic environment. These data are useful in mineral exploration and environmental studies. More than 350 randomly chosen sample sites were visited in 2001 and 2002. At each site, stream sediment and heavy-mineral concentrate samples were collected for chemical and mineralogical analyses. At many sites, vegetation samples were also collected to evaluate naturally occurring metal absorption by various plant species. In 2002, USGS geologists also began collecting water samples to study metal concentrations and their transport in surface and subsurface waters in Donlin Creek and the surrounding area. NovaGold Resources hired an independent contractor to conduct similar hydrologic studies on the property. These studies will continue for the next few years to document the natural background concentrations of various metals in the environment prior to future development of a mine at Donlin Creek. This information will be valuable in determining permitting and environmental monitoring requirements at Donlin Creek.

The 2002 USGS program in the Talkeetna Mountains area included gravity and magnetic geophysical studies. Wrangellia terrane, including host rocks for ultramafic intrusions and possible platinum-group metals mineralization, was found to be two times larger in the area than previously mapped and at least 48 km wider, according to geophysical study results and models.

The BLM conducted a 7-week field program in the Delta River mining district of eastern and south-central Alaska, in which it visited 108 sites (lode, placer, industrial, and coal) and collected 355 samples. BLM plans to conduct 2 more years of fieldwork and possibly acquire more airborne geophysical data in this area.

At the end of October, the Federal Mine Safety and Health Administration (MSHA) presented the True North Mine with a Sentinels of Safety Award for 135,554 hours without lost time because of a work injury during the construction and startup of the mine. The Alaska Department of Natural Resources (DNR) bestowed a reclamation award to a private citizen for his reclamation activities on Birch Creek in the Circle mining district between 1995 and 2002. The DNR also gave the BLM an award for innovative thinking at the Elim project on the Seward Peninsula, which considerably reduced costs of reclamation.

Reference Cited

Swainbank, R.C. and Szumigala, D.J., 2003, Alaska's mineral industry 2002—A summary: Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys, Information Circular 49, March, 15 p.

TABLE 1

NONFUEL RAW MINERAL PRODUCTION IN ALASKA[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2000		2001		2002[p]	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones	NA	11	NA	12	NA	12
Gold[3, 4] kilograms	15,600	140,000	16,700	146,000	16,300	160,000
Sand and gravel, construction	10,600	53,500	11,300	65,600	11,500	67,800
Stone, crushed	1,400	7,110	1,490 [5]	8,140 [5]	1,500	8,400
Combined values of copper, lead, silver, stone [crushed dolomite, limestone, and slate (2001)], zinc	XX	911,000	XX	763,000	XX	796,000
Total	XX	1,110,000 [r]	XX	983,000	XX	1,030,000

[p]Preliminary. [r]Revised. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

[3]Recoverable content of ores, etc.

[4]Data collected by the State.

[5]Excludes certain stones; kind and value included with "Combined values" data.

TABLE 2

ALASKA: CRUSHED STONE SOLD OR USED, BY KIND[1, 2]

Kind	2000				2001			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone-dolomite	--	--	--	--	1	W	W	W
Marble	--	--	--	--	1	45	$533	$11.84
Granite	2	(3)	(3)	$5.14	2	(3)	(3)	8.00
Traprock	4	(3)	(3)	5.03	4	(3)	(3)	4.12
Slate	--	--	--	--	1	W	W	W
Miscellaneous stone	6	(3)	(3)	5.12	6	(3)	(3)	5.46
Total or average	XX	1,400	$7,110	5.08	XX	1,490	8,140	5.48

W Withheld from total to avoid disclosing company proprietary data. XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

[2]Data derived, in part, from information obtained from the Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys.

[3]Withheld to avoid disclosing company proprietary data; included in "Total."

TABLE 3

ALASKA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2001, BY USE[1, 2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	4	$18	$4.50
Other coarse aggregates	7	33	4.71
Coarse aggregate, graded, railroad ballast	W	W	4.08
Coarse and fine aggregates:			
Graded road base or subbase	W	W	3.64
Unpaved road surfacing	W	W	3.64
Crusher run (select material or fill)	56	363	6.48
Special:			
Whiting or whiting substitute	W	W	11.74
Other fillers or extenders	W	W	11.74
Unspecified:[3]			
Reported	1,030	5,660	5.51
Estimated	220	1,080	4.87
Total or average	1,490	8,140	5.48

W Withheld to avoid disclosing company proprietary data; included in "Total."

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

[2]Data derived, in part, from information obtained from the Alaska Department Natural Resoures, Division of Geological and Geophysical Surveys.

[3]Reported and estimated production without a breakdown by end use.

TABLE 4
ALASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2001,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregates and concrete products	1,880	$9,760	$5.19
Plaster and gunite sands	9	130	14.44
Asphalt concrete aggregates and other bituminous mixtures	440	4,980	11.32
Road base and coverings	776	5,520	7.11
Fill	676	2,190	3.24
Snow and ice control	16	142	8.88
Other miscellaneous uses[2]	80	483	6.04
Unspecified:[3]			
Reported	7,050	40,100	5.69
Estimated	412	2,300	5.63
Total or average	11,300	65,600	5.81

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2] Includes railroad ballast.
[3] Reported and estimated production without a breakdown by end use.