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IN THIS ISSUE

NEW MANDATORY STANDARDS COVER COAL MINE EQUIPMENT SAFETY

New and revised rules for the safe use of certain electrical and mechanical underground coal mining equipment are being published in the Federal Register by the Department of the Interior.

The new rules apply to Part 75, Subchapter O, Chapter I, Title 30, Code of Federal Regulations, and they become effective March 31, 1973. They were proposed in the June 14, 1972, Federal Register, and incorporate five changes resulting from written comments received.

Four revised and three new rules deal with electrical equipment. One revision clarifies the intent of the law regarding permissibility requirements for equipment used at the "face"--the place where the coal is cut. Other subjects covered include electrical equipment used in return airways, lightning arresters, high-voltage grounding, and protection of communication wires.

Eight new sections require mechanical safequards. They cover such subjects as guards for moving machinery parts, shields for grinding wheels, safe practices for operation, maintenance, and lubrication of equipment, and handling of high-pressure air systems (those above 100 psig).

Copies of the written comments on the rules as originally proposed are available for public review in the office of the Deputy Director--Health and Safety, Bureau of Mines, Room 4512, 18th and C Streets, N.W., Washington, D. C. 20240.

PLIGHT OF TRAPPED MINERS HELPED BY WIRELESS SYSTEM

(Mining Record, Feb. 28, 1973)

San Antonio, Texas - The plight of miners trapped hundreds of feet below the surface without any means of communication has been the subject of many fictional and unfortunately, factual accounts.

In a project sponsored by the Air Force and the U. S. Department of the Interior, Southwest Research Institute staff members are seeking to use man-made earth vibrations to establish communications through solid rock.

Using Rome Air Development Center (USAF Systems Command) provided piezoelectric transducers in which crystals convert electrical impulses into seismic waves, they have transmitted coded messages through hundreds of feet of solid rock.

Working on the study are Dr. Thomas E. Owen, assistant director of the Institute Department of Electronic Systems Research; staff engineer Craig C. Johnson; and senior electronics technician Gary W. Kirk.

They bolted the two-foot-long battery powered transducer to solid rock in a Missouri iron mine, 2,475 feet below the surface. Then they set up receiving equipment on another level 800 feet away. The rock carried the signals clearly.

The team says the device will not eliminate the telephone as a means of mine communication. However, they point out the impossibility of stretching wires to every work area of a mine.

If a cave-in severed the electrical wires, battery power would keep the unit operative for as long as two weeks. The trapped miners would use the units to send and receive coded signals to inform the surface of the nature of the cave-in and their location and condition. The surface would use the seismic waves to send word of rescue progress to them.

Johnson indicated that the system is not limited to applications in mining disasters, but could be used as a normal communication system in any mining, tunneling or other underground activity that operates in solid rock formations.

SILVER PRICE HITS ALL-TIME HIGH

(Western Mining News, March 2, 1973)

Handy & Harman silver $2.575 up 8.5 cents. This is a new all-time high. The previous high was $2.565 on June 12, 1968.

VEGETATIVE GUIDE FOR ALASKA

(What's Developing in Alaska, February 3)

A publication presenting information on Alaskan soil types, erosion, use characteristics, adapted plant materials and recommended re-vegetation strategies is available. Meetings to discuss use of the information are scheduled for April 11 in Anchorage and April 12 in Fairbanks. The publication brings together the latest recommendations on re-vegetating practices by the Soil Conservation Service, Institute of Agricultural Sciences at the University of Alaska and the University's Cooperative Extension Service. The information is expected to be useful to developers of power and telephone lines, roads, pipelines, tract developers, as well as farmers and individuals concerned with re-vegetation problems.

Five major soil group areas are identified for Alaska. Within each area specific practices are recommended for managing re-vegetation processes. The publication may be obtained through Cooperative Extension Service district offices or by requesting directly from the Editor, Cooperative Extension Service, University of Alaska, Fairbanks. Individuals interested in attending one of the meetings noted above should contact Ted Freeman, Soil Conservation Service, 204 East Fifth Avenue, Room 217, Anchorage 99501, or Alan Epps, Horticulturist, Cooperative Extension Service, University of Alaska, Fairbanks 99701.

ERRATUM

Many of our readers found the obvious error on the front page of our March Bulletin...the volume number and month were left off in the confusion of getting our Annual Report finished and changing personnel. We apologize if this inconvenienced anyone. The correct notation should have read: VOL XXII, March 1973, No. 3.

MINERS VOLUNTEER TO CLEAN UP THE ECOLOGISTS' MESS

Mining companies are often accused of spoiling the environment. Many mining engineers and miners feel these accusations are unjust since frequently the miners are accused of situations over which they have no control or involvement.

A report circulating in Alaska stated that mining operations in the McCarthy District were producing quantities of litter and junk that were despoiling one of the most beautiful upland areas in the district. Air travelers reported seeing a mess of camp materials strewn across the beautiful meadow near a lake. The mining companies were blamed for the mess.

A group of miners working in the area, disturbed by these unjust reports, investigated and found that the ugly blotch of debris on the Alaskan countryside was the discarded remains of an investigation project team carried on by a research organization involved in ecology studies.

After studying the area for several years, the organization suddenly broke camp to move to a new location and left behind quantities of food, medical supplies, chemicals, equipment and yards of plastic material. All of this was scattered across the meadowland, open to the prowling and ravaging of bears and other wildlife.

Johnny Wilson, exploration representative for Geneva-Pacific Corp., a mining and exploration firm operating in the McCarthy District, organized a crew of volunteers, all miners, to clean up the mess on Sunday, their day off.

The Wilson Air Service of Glennallen and helicopter pilot, Joe Saloy donated helicopter time to transport the workers to the area. Six of the Geneva-Pacific crew members cleaned up the debris which was then buried and burned at the site.

Incidents of this type illustrate the concern of the mining industry and its workers in keeping a pure and clean environment in the area in which they work.

"ALL-METRIC" MAPS PLANNED FOR ALASKA

Standand topographic maps based on the International Metric System will be prepared for Alaska, announced the U. S. Geological Survey, Department of the Interior.

The "all-metric" topographic mapping project will consist of the preparation of 31 quadrangle maps, providing coverage for Anchorage and vicinity, including Fire Island, Knik Arm, Lower Matanuska Valley, and the towns of Jonesville on the east, and Willow on the west. The maps, covering an area of about 4,157 square kilometers (1,605 square miles), will be published at a scale of 1:250,000 (1 inch equals about 2,083 feet; 4 centimeters equal 1 kilometer), with 5-, 10-, or 20-meter contour intervals.

"The project," said Robert H. Lyddan, Chief, Topographic Division, USGS, Washington, D. C., "marks Alaska as the first State in the Nation that will have large-scale mapping published with metric units in anticipation of eventual conversion to the International Metric System."

Among the reasons for the selection of Alaska for the all-metric mapping project, according to Lyddam, was that "there are very few maps available at similar scale for Alaska, and this represents an opportunity to start a new series without conflicting with previous map series at the same or nearly the same scale. The new map series will complement the smaller 1:63,360-scale (1 inch = 1 mile) map series in the State."

Lyddan said that a shift from English to metric units may cause problems for both the makers and users of maps, but that this had been discussed with representative map users in Alaska. "It is anticipated," Lyddan noted, "that distances, spot elevations, and similar values, will be shown in both English and metric units."

IT'S TIME AGAIN.

We are updating our mailing list for our Annual Report, which is now being printed. If you would like a copy, please send your current mailing address to Division of Geological and Geophysical Surveys, P. O. Box 80007, College, Alaska 99701.

MODERN MINING BLASTS HILL TO MINE HIGH GRADE FELDSPAR ORE

(The Mining Record, February 7, 1973)

Riverton, Wyo. - Making a hole out of a hill was the general purpose of the Modern Mining and Milling Company in Bonneville as they set a 13,000 pound charge at their mine on Copper Mountain.

The reason for the blast was a hill of high grade feldspar that was discovered mixed in with the rock in the hill.

Under the supervision of Joe Highsmith, company owner, 400 holes were drilled ranging from 20 to 30 feet. The holes were filled with ammonia-nitrate and dynamite. The charge was fused with Primacord and the holes were stemmed with dirt.

The drilling of the holes took two weeks with three shifts working around the clock.

The shot was scheduled for 2 p.m. Friday but due to weather conditions did not take place until about 7 p.m.

It is estimated that the blast brought down 26,000 tons of rock from what used to be a hill.

The feldspar will be milled and sent to Kansas City where it will go to be used in cleansers, paint, paving, glass and many other products.

Highsmith said the feldspar was excellent quality as judged from testing the drill cores. He added this one blast should keep the mill working through the winter.

The explosion itself could not be seen or heard, even in the darkness. The concussion was not as strong as Highsmith expected.

"I never made a shot at night," said Highsmith, "and I didn't know what to expect."

He added men and equipment were moved a longer distance from the blast because of the extra danger of shooting at night, "At night you can't see rocks flying so you can't get out of the way," said Highsmith.

PUBLIC REALIZES IMPORTANCE OF MINING

(Engineering and Mining Journal Dec. 1972)

A public awareness of the importance of mining is beginning to emerge despite the intense governmental drive to regulate, regiment, and curtail the natural resources industry, American Mining Congress president J. Allen Overton, Jr., said in Butte, Mont., recently. Keynote speaker at the first convention of the newly formed Western Montana Mining Association, Overton sees a growing public realization that the US must overcome an increasing reliance on imports of minerals and must encourage exploration for and production of minerals at home.

Helping to create this awareness is the emerging public discussion of the nation's energy crisis, he told the meeting at the Montana College of Mineral Science and Technology, a cosponsor of the convention along with the Montana Bureau of Mines and Geology. Asserting that the nation's standard of living and security are at stake, Overton called for a governmental climate that will promote the development of a strong domestic mining industry.

A. J. Teske, secretary of the Idaho Mining Association, reminded the 300 delegates that mining is the backbone of the nation's economy - that without its products the national economy would come to an abrupt halt. Yet many persons fail to realize this, he said.

Russel Chadwick, president of the Northwest Mining Association at Spokane, charged that a small but clever group of dedicated amateurs and hardcore professionals have made mining and the mineral resources of the public lands environmental issues in the public mind. "This group controls a large network of interlocking, well-financed 'nature' associations," he said. "They have radicalized their large combined memberships and others by means of a highly effective propaganda apparatus. The result is a very effective political action capability on every level . . . By contrast, the mineral industry is simply not in the same league."

Carl H. Cotterill, a minerals position analyst for the US Bureau of Mines in Washington, D. C., predicted a huge future demand for minerals and said the Government some day may have to curtail use of mineral materials unless there is devised a proper climate and incentives which will encourage private enterprise to produce more minerals.

Fred Earll, head of Montana Tech's Geology Department, said the nation will have to get "hungrier" for metals before the miners get the better operating climate and higher metal prices they need. He charged that the State of Montana has an anti-industry attitude and that although Montana has abundant reserves of coal, copper, and gold and good supplies of silver, lead, zinc, and other minerals, he fears the economic climate will not allow their development for at least another decade.

Frank M. Monninger, manager of the Anaconda Co.'s Butte operations, reported that from 1862 through 1971 Montana yielded minerals valued at nearly $9,000 million and that mineral output continues at a rate of about $300 million a year.

The two-day meeting concluded with a panel discussion of programs and actions needed to convince the public and lawmakers of the need for a healthy minerals industry. Suggestions included a massive educational program to get the industry's story across, with mine operators seeking newspaper coverage by reporters who make an effort to get the facts. It was suggested that the industry work to elect qualified legislators who understand the industry's problems and recognize the need for a strong domestic minerals industry, that the industry adopt its own voluntary code of good exploration and reclamation practices, and that mining and petroleum personnel present a united front.

GOING TO THE DOGS...
(Geotimes, February, 1973)

Five mining companies based in Vancouver have added Labrador retrievers to their ore-finding efforts, and the St Joe Minerals Corp. has a contract with a male German shepherd named Jai (as in jive) to prospect for sulfide-bearing rocks in the Adirondack country. The story about Jai, which appeared in the N.Y. Times, contained a bit of unintentional humor when it said the dog was good at finding soil-covered "outer (sic) croppings."

GREEK BROWN COAL MINING
(Mining Magazine, December 1972)

Payable brown coal deposits in the northern part of Greece between Kozani and Ptolemais amount to over 900 million tons.

During 1970, 6.1 million tons were recovered using five bucket wheel excavators, of which four were supplied by Krupp of West Germany. In the same year, the adjacent power plant produced 345 MW of power from this brown coal.

Extension of the power plant during 1972 has made available a total of 645 MW. Concurrent with this, the Ptolemais Lignite Mining and Industrial Co. Ltd. opened up the Kardia opencast mine with a nominal capacity of 5 million tons. Recently, six bucket wheel excavators Type Sch Rs 600/3.3:2.1 (991 tons each); two type ARs 1800/30 + 60:14 spreaders; one bunker discharge excavator, type GE 900/7:4; and two wagon weighing machines were put into operation at the mine. The machines were supplied by the Bucket-Wheel Export-Union, Krupp-Orenstein & Koppel. Each spreader is fed by three bucket wheel excavators. The machines have been designed with matching output capacities.

The design of the new bucket wheel excavators is similar to the design of machines which have been working there for some years. They have, however, been provided with a stronger bucket wheel drive. Major parts of the steel structure are now welded, so that the total weight and, thus, the ground pressure is lower than that of the older machines. The new machines have a ground pressure of about 1.0 kg/cm^2. The spreaders are of an entirely new design to suit the opencast conditions. These have now been equipped with steel cord belts. The entire conveyor path has catenary idlers.

This development has made the Ptolemais area the largest power producing center in Greece. At the same time, power generation ensures the production of considerable quantities of brown coal briquettes and the operation of a fertiliser plant with an annual production of 300,000 tons of nitrogen fertilisers.

HUGHES TOOL ANNOUNCES NEW SILVER INLAID BIT
(Western Mining News, January 19, 73)

A drilling bit for hard formations recently ran 2,796 feet in 183-1/2 hours without stopping. Makers of the bit advertise: "Journal bearing bits inlaid with silver, packed with profit. Your bonus is in the bearing and silver makes the difference."

Hughes Tool, which makes the bit, is talking about a bit designed for the petroleum industry but which is finding its way into hardrock mining as well. And they emphasize that it's the silver inlays in the journal bearings that provide dry lubrication, disperse heat, accept pressure, defy friction and resist corrosion.

Because of a small amount of silver, journal bearings last 3 to 15 times longer than those without silver.

The addition of silver inlays, according to the Hughes people, has led to one of the major improvements of all time in rock drilling.

Hughes has applied silver to journal bearings in several types of bits. The one for hard formations is model J88, mentioned above; its record run occurred near Maljamar, N.M. For medium-hard formations model J55 had a record run of 4,490 feet in 277 hours. Other bits are used for other formations.

These silver bearings work..., and endure...at 20,000 psi of hydraulic pressure in temperatures around 400 degrees fahrenheit. The pressure on the bearing face is in the range of several tons per square inch. In these conditions the silver inlays in the journal bearing slide, carry away heat, stay smooth and do not oxidize.

The cutaway model, lower photo, shows some of the 20 axial strips of silver metal in the bearing. The strips are solid metal inlaid into the bearing face. They share the load with the adjoining nonsilver metal, without galling and with less wear than other metals in this kind of duty. The external cone in the photo is the bit; it rotates against the solid journal bearing pin at 100 to 200 rpm. The bit assembly comes in many sizes weighing from 15 to 500 pounds.

COST BREAKTHROUGH USING TUNNEL REAMING SYSTEMS IN GRANITE

(Mining Magazine, October 1972)

The many tunnels required for motor roads and hydro-electric projects in the Alps induced Alfred Wirth & Co. KG, of Erkelenz (West Germany), to design tunnelling machines and cutters, first in cooperation with the Hughes Company of the United States and later independently. Their new 10 ft (3m) machine was first used for an inclined (35°) tunnel at Grand Emosson, 3,750 ft (1,145m) long, and later for a horizontal and inclined (42°) tunnel, 4,593 ft. (1,400m) long, in the same massif. This is claimed to be the first instance in the world in which machines weighing up to 90 mtons were used in faulted and solid granite without any major trouble and with satisfactory economic results.

The main design improvement relates to the drive of the cutter head; geological faults proved difficult to cross with an electric drive and a fixed drilling speed. All machines are therefore equipped with hydrostatic drive which permits a stepless variation of the drilling head speed. A second advance relates to a multi-stage reaming system where the machine is braced in a pilot hole and therefore becomes smaller. Four guide shields near the drilling head can be used to offset the drilling axis relative to the pilot axis. The pilot hole is drilled ahead with a small diameter and the tunnel is then enlarged in one or more stages to the final diameter by reamer heads. Such reamer machines are in service at present in a road tunnel in the Sonnenberg near Lucerne, in a pressure tunnel of the hydro-electric plant of the Schluchsee near Wehr and in the Consolidation coal mine in the Ruhr district. The main advantages of the reaming system are low capital costs compared with a full-face tunnelling machine to the same final diameter; east of changing the drilling diameter if desired; and the advantages derived from the geological information and operational experience.

Reaming saves costs

All pilot tunnels are drilled with a diameter of 10 ft (3m) or 11 ft 6 in (3.5m). The enlarged diameters are 17 ft 5 in (5.3m) at Consolidation, 20 ft 8 in (6.3m) at Wehr, and 34 ft 4 in (10.46m) at Lucerne. These reamer machines can be easily reduced in diameter by shortening the cutter arms, or enlarged within certain limits. They have been offered for tunnel diameters of up to 46 ft (14m) whereas full-face machines are at present limited to a diameter of 39 ft 4 in (12m). The installed horsepower is less, the machines are cheaper and the drilling times are about the same. A full-face machine is recommended only for very long tunnels.

The Wirth development programme includes a jacketed tunnelling machine for friable soft rock where the bucket mechanism and the drilling head are protected against stone fall. This machine design is more slender and offers room between drilling head and guide shields to set roof supports. A second new project is a

computer-controlled tunneller and a third is a winze drilling machine for diameters from 10 to 26 ft (3 to 8m).

Experience has shown that the downtime of a Wirth tunneller averages 3 per cent of the total service time; maintenance and exchange of the drilling cutters also requires about 3 per cent. In addition customer and spare-part service has been organized.

NEW REPORTS ON ALASKAN GEOLOGY

The Bibliography and Index of Geology (v. 36, no. 11, November 1972) published by the Geological Society of America contains the following Alaskan entries:

Bingham, D. K.; Stone, D. B., 1972, Palaeosecular Variation of the Geomagnetic Field in the Aleutian Islands, Alaska: R. Astron. Soc., Geophys. J., Vol. 28, No. 4, p. 317-335, illus. (incl. sketch map)

Buckley, D. E., 1972, Geochemical Interaction of Suspended Silicates with River and Marine Estuarine Water; In Geochemistry-Geochimie, Section 10: Int. Geol. Congr., Proc.-Congr. Geol. Int., Programme, No. 24, p. 282-290, sketch maps. *Interaction of clay minerals with dissolved constituents of water, chemical partition, changes in chlorites but not in mica, North Dawes Inlet, Alaska*

Churkin, M., Jr.; Merriam, C. W.; Rowett, C. L.; others, 1971, Paleozoic corals of Alaska; their stratigraphic occurrence and correlation [abstr.]; In Mezhdunarodnyy paleontologicheskiy simpozium po korallam (Coelenterata), Tezisy Dokladov, p. 120-121: Akad. Nauk SSSR, Sib. Otd., Inst. Geol. Geofiz.-Otd. Obshch. Biol., Kom. Izuch. Iskop. Korallov, Novosibirsk

Clark, A. L.; Greenwood, W. R., 1972, Geochemistry and Distribution of Platinum Group Metals in Mafic to Ultramafic Complexes of Southern and Southeastern Alaska [abstr.]; In Geochemistry-Geochimie, Section 10: Int. Geol. Congr., Proc.-Congr. Geol. Int., Programme, No. 24, p. 201. *Anomalies and correlations, similarities to complexes of the Urals*

Clocchiatti, Robert, 1972, Les cristaux de quartz des ponces de la Vallee des Dix Mille Fumees (Katmai, Alaska) [Quartz crystals in the pumice from the Valley of Ten Thousand Smokes, Katmai, Alaska]: Acad. Sci., C. R., Ser. D, Vol. 274, No. 23, p. 3037-3040, Illus. *Crystal growth, chemistry of volcanics, temperature of formation, surface properties*

Davies, W. E., 1972, The Tintina Trench and Its Reflection in the Structure of the Circle Area, Yukon-Tanana Upland, Alaska; In Tectonics-Tectonique, Section 3: Int. Geol. Congr., Proc.-Congr. Geol. Int., Programme, No. 24, p. 211-216, sketch map. *Tintina fault-zone, wrench system with right lateral movement, history of structural complexes, Precambrian to Pleistocene*

Foster, H. L., 1972, Metamorphic Facies of the Yukon-Tanana Upland, East-Central Alaska [abstr.]; In Petrology-Petrologie, Section 2: Int. Geol. Congr., Proc.-Congr. Geol. Int., Programme, No. 24, p. 75-80. *Mostly Paleozoic regional metamorphism, mineral assemblages, P-T conditions*

Hissenhoven, Rene van, 1972, Travel-Time Anomalies of P-Waves between the Aleutian Islands and Matsushiro Seismic Station: Int. Inst. Seismol. Earthquake Eng., Individ. Stud., Vol. 7, p. 37-45, illus. (incl. sketch maps)

Madhusudan, Sheth, 1971, A heavy mineral study of Pleistocene and Holocene sediments near Nome, Alaska: Master's, San Jose

Mull, C. G.; Mangus, M. D., 1972, Itkilyariak Formation; New Mississippian Formation of Endicott Group, Arctic Slope of Alaska: Am. Assoc. Pet. Geol., Bull., Vol. 56, No. 8, p. 1364-1369, illus. (incl. geol. sketch map). *Type section in the Sadlerochit Mountains*

Okamoto, Yoshifumi, 1972, Piedmont Glaciation in the Taiga Forests of Ice Ages in Japan and Northern Italy Similar to Those Now Present in Southern Alaska; In Quaternary Geology-Geologie du Quaternaire, Section 12: Int. Geol. Congr., Proc.-Congr. Geol. Int., Programme, No. 24, p. 175-186, illus. (incl. sketch maps). *Fall in snow-line, 1000-1500m, North Pole displacement, glaciation at high altitudes, evidence from various areas, correlation*

Ovenshine, A. T.; Brew, D. A., 1972, Separation and History of the Chatham Strait Fault, Southeast Alaska, North America [abstr.]; In Tectonics-Tectonique, Section 3: Int. Geol. Congr., Proc.-Congr. Geol. Int., Programme, No. 24, p. 245-254, sketch maps. *Right-lateral displacements of various extent at different ages*

Pewe, T. L.; Reger, R. D., 1972, Modern and Wisconsinan Snowlines in Alaska; In Quaternary Geology-Geologie du Quaternaire, Section 12: Int. Geol. Congr., Proc.-Congr. Geol. Int., Programme, No. 24, p. 187-197, sketch maps. *Minimal changes in topography, wind belts and precipitation since Wisconsinan*

Shor, G. G., Jr.; Von Huene, Roland, 1972, Marine seismic refraction studies near Kodiak, Alaska: Geophysics, Vol. 37, No. 4, p. 697-700, illus. (incl. sketch map). *Crustal structure cross-section from the east end of Kodiak Island to the Aleutian Trench*

Smiley, C. J., 1972, Applicability of Plant Megafossil Biostratigraphy To Marine-Non Marine Correlations; An Example From the Cretaceous of Northern Alaska; In Paleontology-Paleontologie, Section 7: Int. Geol. Congr., Proc.-Congr. Geol. Int. Programme, No. 24, p. 413-421, illus. (incl. sketch maps). *Eight major zones, Albian-Maestrichtian, conifers, Gingko, fern, dicot*

Stevens, C. C., 1971, A provenance study of the Tertiary sandstones in the Healy and Lignite Creek coal basins, Alaska: Master's, Alaska

Swainbank, R. C., 1971, The geochemistry and petrology of eclogitic rocks near Fairbanks, Alaska: Doctoral, Alaska

Wisehart, R. M., 1971, Paleoenvironmental analysis of the Bear Lake Formation (upper and middle Miocene), Alaska Peninsula, Alaska: Master's, UCLA

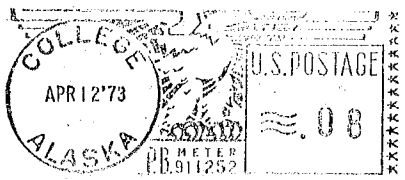
NEW OPEN FILE REPORTS

U. S. Geological Survey open-file reports concerning Alaskan geology are listed here in a form suitable for inclusion in the next volume of the Bibliography of Alaskan Geology published by the Alaska Geological Survey. The numbers assigned to these reports are informal ones used by the Alaskan Mineral Resources Branch of the USGS at Menlo Park, California. New reports are as follows:

Miller, T. P.; Grybeck, D. G., 1973, Geochemical survey of the eastern Solomon and southeastern Bendeleben quadrangles, Seward Peninsula, Alaska: U. S. Geol. Surv., Alaskan open-file rept. #553, 8 p. text plus 107 p. print-out.

METAL MARKET

Metals	April 2, 1973	Month Ago	Year Ago
Antimony ore, stu equivalent, European ore	$10.20-11.20	$9.20-10.20	$8.64-10.00
Barite (drilling mud grade per ton)	$18-22	$18-22	$18-22
Beryllium powder, 98%, per lb.	$54-56	$54-56	$54-66
Chrome ore per long ton	$24-27	$24-27	$25-27
Copper per lb.	60¢	56.7¢	52.5¢
Gold per oz.	$84.58	$84.58	$48.94
Lead per lb.	16.0¢	16.0¢	15.5¢
Mercury per 76# flask	$300	$300	$186
Molybdenum conc. per lb.	$1.72	$1.72	$1.72
Nickel per lb. (cathode)	$1.53	$1.53	$1.33
Platinum per oz.	$138.94	$170	$110-120
Silver, New York, per oz.	225.9¢	255¢	154¢
Tin per lb., New York	203¢	203.4¢	178.2¢
Titanium ore per ton (Ilmenite)	$22-24	$22-24	$30-35
Tungsten per unit	$55.00	$55.00	$55.00
Zinc per lb.	20.26¢	19.2¢	17.0¢



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