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DIVISION OF MINES AND GEOLOGY

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EAGLE ASBESTOS

A Canadian based news firm--George Cross News Letter Limited--released information in the February 28 issue concerning the asbestos discovery near Eagle.

Silver Standard Mines Limited, a Canadian mining firm and Don Roberts and Associates, Alaskan prospectors, staked a block of claims covering an asbestos find near Eagle on a 50-50 basis. The deposit is about 60 miles west of the Clinton Creek deposit of Cassiar Asbestos. The deposit was staked on the basis of a U.S. Geological Survey news release.

Cassiar Asbestos Corporation Limited reached an agreement with Don Roberts and Associates and acquired their 50 percent interest. Silver Standard and Cassiar are now 50-50 partners in the claims. An exploration program is planned for the property; it will begin early in May.

The land freeze has raised some questions about the validity of the claims. The Pickett Act of 1910, the statutory authority for the land freeze, notes that mining claims for metallic minerals can be located in spite of the withdrawal. A decision by the Department of the Interior or Congressional Legislation will be necessary to resolve the question of whether mining claims for asbestos are valid.

EXPLORATION ACTIVITY

Cities Services Minerals Corporation has announced that they will manage a joint exploration venture on a copper prospect near Denali. An exploration tunnel, 750 feet in length, is planned. Transportation of supplies to the tunnel site will begin early in April. Work on the tunnel will commence late in May or early in June.

The project will require the services of about 20 men and the excavation should be completed before late summer. Deep drilling will be done from the tunnel level to determine the next phase in the exploration venture.

COAL NEWS

The February issue of International Coal Trade, a monthly publication of the U.S. Bureau of Mines, contains an article pointing out the increasingly optimistic picture for coal and coal products.

The year 1968 was a banner year for U.S. coal exports. Bituminous and anthracite exports in 1968 totaled 51,155,149 short tons, a gain of 1,050,241 short tons over 1967. The value of the coal exported in 1968 was \$502,532,620. This amount is 1.5 percent of total U.S. domestic export value and it represents an important positive contribution to the U.S. international balance of payments.

Important positive changes in U.S. coal exports in 1968 were the sharply increased exports to Japan (+ 3,589,361 tons). The rapidly rising Japanese demand diverted U.S. exports from Europe, where increased availability of lower-cost fuels and energy decreased the need for coal imported from the U.S. The new coal purchases by Japan were mostly on short term contracts which were in addition to existing long-term contracts.

#### DIVISION COMMENTS ON WATER REPORT

On March 6, 1969 the Alaska Water Laboratory, a branch of the Federal Water Pollution Control Administration (FWPCA), issued a news release stating that a report entitled "Effects of Placer Mining on Water Quality in Alaska" is available.

The news release and the report state that the Alaska Division of Mines and Geology cooperated with the Water Laboratory in the investigation. A Division engineer did accompany the field team, but we took no part in preparation of the report and do not agree with its conclusions.

The Division feels that the main conclusion of the report -- "placer mining results in increased turbidity and reduced dissolved oxygen with significant damage to fish and fish food organisms" is based on incomplete sampling and biased opinions.

Issuance of the report brought similar responses from the College of Earth Sciences and Mineral Industries and the Alaska Miners Association. We will be glad to mail interested persons a copy of our complete detailed comments on the FWPCA report upon request.

#### MINERAL EXPLORATION IN 1968

An excellent article with above title in the February Mining Congress Journal contains the following quoted excerpts regarding worldwide exploration:

"Although exploration was carried out in nearly every country in the world, the greatest concentration of effort--certainly the most publicized--took place in Australia. Again, United States firms dominated in exploration, but the Japanese have received much of the production from deposits discovered by Americans in recent years, not only in Australia but throughout the world. Where American firms look for ore and then try to find markets for it, the Japanese, in the main, wait for ore to be found and then negotiate contracts for a share or all of the mineral materials produced.... The increase in exploration effort in Indonesia reflects increased confidence in the political stability and enlightened economic policies of the Suharto regime.... American exploratory effort abroad seems to have been greater in the past year than in any previous year in history. On the other hand, Amax' sale of its share in the Palabora property to obtain U.S. funds for investment abroad indicates some financial strain imposed by the American restrictions. Any restricting regulations are one more factor that must be included in the exploration decision-making process.... These (oil) companies appear to have reached the conclusion that huge mineral-right leases might as well be explored for everything they contain and not just for oil, and they have begun to obtain leases in areas probably far more favorable for the discovery of metals than of petroleum. As an example of this approach, Phillips Petroleum has reported finding sizeable sulfide deposits in the Carolinas, and Humble Oil has agreed to finance any direct exploration in 641 square miles in northern Maine, an area adjacent to holdings optioned by Noranda from Scott Paper Co.... As mineral exploration becomes steadily more complicated, it also becomes more costly, and, as the deposits found are lower and lower in grade, the cost of bringing them into production on the huge scale that is required for their profitable exploitation also rises steeply.... the huge capital resources of the oil companies probably are their greatest strength in competing with established mining companies.... Much of the exploration effort in Australia, the

South Pacific Islands, western South America, the western U.S., and British Columbia is made possible by understandings that Japanese firms will buy the products (usually as concentrates) of such mines as are developed.....At present, exploration targets (porphyry-copper) are orebodies of 70 to 100 million tons that can be mined by open pit methods, have a waste to ore ratio of less than 3 to 1, and have recoverable metal contents of about \$3.00 per ton. Obviously, in such deposits, there is no margin for error, and feasibility studies are a must before the discovered deposit can be exploited. Most of them are test mined in advance by computer simulation techniques until the most profitable approach to the problem has been defined.....British Columbia is one of the most favorable areas of the world for investment of foreign capital.....Recent feasibility studies apparently have established that the Lornex Mining Corp. property in the Highland Valley area of British Columbia, low grade though it is in copper and molybdenum (0.427 percent Cu and 0.014 percent Mo), can be profitably mined,.....The Japanese even have plans to tap the mineral resources of the U.S.S.R.; if reports are true that they are negotiating a series of agreements for exploration and development in Siberia. The Soviets have suggested that similar agreements with American capital would be welcome!.....The Argentinean government arranged with the United Nations Special Fund for Development to provide the top technical personnel for a study of over 130,000 square kilometers of the eastern Andes while the Argentine furnished logistical support and most of the geological staff.....the Argentinean government notified the mining companies of the world that it would accept bids for further exploration of the various reserved areas.....To encourage bids, the government has announced tax reliefs and guarantees of contract validity to provide the necessary technical, economic, financial, and political climate necessary to sound operations.....As a follow-up to this program, the Argentinean government is areally photographing 250,000 square kilometers farther north in the Cordillera;.....A similar program in Panama has located what may be a sizeable porphyry-copper type of deposit in a rather remote portion of that country, but several mining firms already have shown interest in the results.....On the other side of the Andes, the Chilean government has signed an agreement with the United Nations Special Fund for Development that will result in spending nearly \$2 million over a 2 1/2 year period.....The Chilean government also has entered into an agreement with International Telephone and Telegraph to prospect for copper deposits in the northern part of that country.....Work done by D. P. Harris in, and prior to, 1968 has shown that a quantitative evaluation of the mineral resources of a region as a function of reconnaissance geology can provide a sound base for developing an exploration program. This method treats geologic information as variables in a multivariate model in which mineral wealth is related to geology probabilistically.....Harris' most recent work was a broad-based evaluation of selected areas of Alaska, totaling 200,000 square miles, for their potential base and precious-metal resources. This study indicated an expected occurrence of five cells (20-square-mile subdivisions) with a residual (as yet unknown) gross value of at least \$400 million per cell and 16 cells with from \$100 million to \$400 million per cell. A second study employed computer simulation to relate economics of exploration and exploitation to the probabilities of mineral occurrence for the Seward Peninsula of Alaska, particularly to estimate the amount of base and precious-metal resources that may occur in economic quantities and grade. This analysis indicated that, of the 400 million tons of ore that were estimated by the geostatistical analysis to occur at an average grade about \$15 per ton, when exploration efficiency, alluvial cover, and current realistic costs are considered, 66 million tons at an average grade of \$43 per ton constitute the economic resource potential of the Seward Peninsula for base and precious metals. This total tonnage is expected to be produced from 30 mines, having an average gross value of \$95 million per mine. The bulk of these lode deposits are expected to occur in a belt following the crest of the Bendeleben Mountains."

### ANTIMONY PURCHASE INQUIRY

We have received a request for information on possible sources of ore containing 35% to about 55% antimony. A copy of the letter will be furnished on request.

### NEW PUBLICATIONS

The Mineral Industry Research Laboratory, University of Alaska, College, Alaska, 99701, has the following new reports available:

MIRL Report No. 20 -- Heavy Minerals in Alaskan Beach Sand Deposits by Donald J. Cook.

MIRL Report No. 21 -- Washability Characteristics of Low-Volatile Bituminous Coal from Bering River Field, Alaska by P. Dharma Rao.

The following open file report has been released by the USGS and is available for consultation in the Alaskan USGS and State Division of Mines and Geology offices. Material from which copies of this open file report can be made at private expense is available at the Alaskan Geology Branch, USGS, 345 Middlefield Road, Menlo Park, California 94025:

Preliminary Geologic map of the Black River quadrangle, east-central Alaska, by Earl E. Brabb, 1 sheet, scale 1:250,000.

### NOTES ON MINERAL EXPLORATION

Geologic discrimination as a tool for exploration - "Exploration Programs for Small Mining Companies" is the title of an article by J. D. Bateman that appeared in the December, 1963 issue of the Mining Congress Journal. Material from the article will be published in installments in our Bulletin by permission of the editor of the Mining Congress Journal.

Mr. Bateman defines a small mining company as one having a single mining operation that generates limited income, or a company whose orebodies are approaching exhaustion and is searching for new sources of ore, or a company that must use capital rather than income to finance exploration efforts. The question is: How can the small company compete against the massive power of expenditure exercised by a large company on a statistical and intelligent basis over a long period that will inevitably result in the development of large ore reserves.

The chances for discovery based on statistical probability are poor. The following example is based on Canadian experience but it is equally applicable to the United States as geologic features seldom coincide with international boundaries. In Canada, in a given year, there are approximately 1,000 prospecting teams in the field. These include independent full-time prospectors, weekend prospectors or company men. Experience shows that their efforts will lead to five significant discoveries. A significant discovery is one that leads to underground development, but not necessarily a producing mine.

Based on the above statistics if a company sent out one prospecting team per year it would have to be prepared to do so for 200 years to insure a significant discovery with no assurance of a return on the investment. The statistics are alarming but the odds can be significantly improved by careful geologic discrimination in selecting an area to concentrate maximum effort. No prospector can make a discovery in an area where there are no mineral deposits to discover.

The above points out the value of the work done by organizations such as the Division of Mines and Geology. Our reports and publications make geologic information available to interested persons and aid materially in the discriminatory selection of areas for prospecting.

In future Bulletins further comments from Mr. Bateman's article will be presented to point out exploration problems facing the small mining company as well as suggested solutions.

E. AND M. J. METAL MARKET PRICES

	<u>March 24</u>	<u>Month Ago</u>	<u>Year Ago</u>
Copper, per lb.	44.3¢	44.2¢	Suspended
Lead, per lb.	14.0¢	14.0¢	14¢
Zinc, per lb.	14.0¢	14.0¢	13.5¢
Tin, per lb.	153.25¢	167.5¢	145.8¢
Nickel, per lb.	\$1.03	\$1.03	94.0¢
Platinum, per oz.	\$120-125	\$120-125	\$109-114
Mercury, per flask	\$517-520	\$537-545	\$560-590
Antimony ore, per unit	\$7.00-7.14	\$6.70-6.79	\$5.00-5.95
Beryllium powder, 98%	\$54-66	\$54-66	\$54-66
Chrome ore, long ton	\$31-35	\$31-35	\$31-35
Molybdenum conc, per lb.	\$1.62	\$1.62	\$1.62
Titanium ore, per ton	\$20-21	\$20-21	\$21-24
Tungsten, per unit	\$43.00	\$43.00	\$43.00
Silver, New York, per oz.	184.0¢	181.5¢	225.0¢
Gold, per oz.	\$43.40	\$43.00	---
Barite (drilling mud grade from E/MJ February)	\$12-16		

OIL AND GAS NEWS

(Prepared by the Division of Oil and Gas, 3001 Porcupine Drive, Anchorage, Alaska 99504)

Seven applications for drilling permits were approved by the Division of Oil and Gas as follows:

Permit No. 69-17. Union Oil Company of California #G-19 Trading Bay Unit, API No. 50-133-20178. Surface location: 1,827' PSL and 1,491' FEL, Sec. 29, T9N, R13W, S.M. Bottom hole location: 200' ENL and 1,790' ENL, Sec. 29, T9N, R13W, S.M. This development location is in the McArthur River Field.

Permit No. 69-18. Phillips Petroleum Company #A-4 North Cook Inlet Unit, API No. 50-283-20023. Surface location: 1,259' FNL and 1,087' FNL, Sec. 6, T11N, R9W, S.M. Bottom hole location: 1,095' FSL and 1,465' FEL, Sec. 6, T11N, R9W, S.M. This development well is in the North Cook Inlet Field.

Permit No. 69-19. Inlet Oil Corporation #1 Fish Creek, API No. 50-283-20024. 1,925' FSL and 1,240' FEL, Sec. 13, T17N, R6W, S.M. This exploratory location is about 25 miles northwest of Anchorage.

Permit No. 69-20. Shell Oil Company #A-22-1 Middle Ground Shoal, API No. 50-133-20179. Surface location: 1,678' FSL and 368' FEL, Sec. 11, T8N, R13W, S.M. Bottom hole location: 1,593' FNL and 1,565' FNL, Sec. 11, T8N, R13W, S.M. This development location is in the Middle Ground Shoal Field.

Permit No. 69-21. Atlantic Richfield Co. #1 Lake State, API No. 50-029-20012. 2,400' FNL and 2,640' FEL, Sec. 24, T10N, R15E, U.M. This exploratory location is eleven miles southeast of the Prudhoe Bay discovery well.

Permit No. 69-22. Atlantic Richfield Co. #1 N.W. Eileen State, API No. 50-029-20013. 2,640' FNL and 2,640' FEL, Sec. 28, T12N, R11E, U.M. This exploratory location is about twenty miles west of the Prudhoe Bay discovery well.

Permit No. 69-23. Union Oil Company of California #K-16 Trading Bay Unit, API No. 50-133-20180. Surface location: 731' FSL and 142' FEL, Sec. 17, T9N, R13W, S.M. Bottom hole location: 640' FSL and 860' FNL, Sec. 16, T9N, R13W, S.M. This development location is in the McArthur River Field.

DRILLING ACTIVITY (as of March 25, 1969)

<u>Operator</u>	<u>Well Names &amp; Numbers</u>	<u>Type</u>	<u>Status</u>
<u>Southern</u>			
Atlantic Richfield Company	N. Trading Bay State S-2	D	Drilling
Atlantic Richfield Company	N. Trading Bay State S-3	D	Comp. Oil Well
Gulf Oil Corporation	Middle Lake Unit #1	E	Drilling
Halbouty Alaska Oil Company	Theodore River #1	E	Location
Inlet Oil Company	Fish Creek #1	E	Drilling
Mobil Oil Corporation	Granite Point #32-23	D	Drilling
Mobil Oil Corporation	MUC #1-1	E	Drilling
Pan American Petroleum Corp.	Bachatna Creek State #1	E	Drilling
Pan American Petroleum Corp.	David River #1-A	E	Drilling
Pan American Petroleum Corp.	MGS State #12	D	Testing - Wtr. Inj.
Phillips Petroleum Company	North Cook Inlet Unit A-1	D	Comp. Gas Well
Phillips Petroleum Company	North Cook Inlet Unit A-3	D	Comp. Gas Well
Phillips Petroleum Company	North Cook Inlet Unit A-4	D	Drilling
Shell Oil Company	MGS A-22-1	D	Location
Shell Oil Company	MGS "C" Line #1	D	Testing
Texaco, Inc.	Trading Bay TS-5	D	Temp. Susp.
Texaco, Inc.	Trading Bay TS-6	D	Location
Union Oil Co. of Calif.	Kenai Deep Unit #4	D	Drilling
Union Oil Co. of Calif.	Trading Bay State A-19	D	Location
Union Oil Co. of Calif.	Trading Bay State A-20	D	Location
Union Oil Co. of Calif.	Trading Bay Unit D-14	D	Drilling
Union Oil Co. of Calif.	Trading Bay Unit D-16	D	Location
Union Oil Co. of Calif.	Trading Bay Unit D-17	D	Comp. Oil Well
Union Oil Co. of Calif.	Trading Bay Unit G-16	D	Drilling
Union Oil Co. of Calif.	Trading Bay Unit G-17	D	Comp. Oil Well
Union Oil Co. of Calif.	Trading Bay Unit G-19	D	Drilling
Union Oil Co. of Calif.	Trading Bay Unit K-10	D	Comp. Oil Well
Union Oil Co. of Calif.	Trading Bay Unit K-15	D	Drilling
Union Oil Co. of Calif.	Trading Bay Unit K-16	D	Drilling

Northern

Atlantic Richfield Company	Delta State #1	E	Temp. Susp.
Atlantic Richfield Company	Lake State #1	E	Drilling
Atlantic Richfield Company	Nora Federal #1	E	Drilling
Atlantic Richfield Company	N.W. Eileen State	E	Location
Atlantic Richfield Company	Toolik Federal #1	E	Drilling
BP Oil Corporation	Put River #1	E	Drilling
BP Oil Corporation	Put River BP 33-11-13	E	Drilling
BP Oil Corporation	Sag Delta #1	E	Location
BP Oil Corporation	Sag Delta #31-11-16	E	Drilling
Colorado Oil and Gas Corp.	Shaviovik #1	E	Location
Mobil-Phillips	Kuparuk State #1	E	Drilling
Pan American Petroleum Corp.	Kavik #1	E	Temp. Susp. - Fire
Sinclair Oil Corp.	Sinclair BP Ugnu #1	E	Drilling
Standard Oil Co. of Calif.	SOCAL 31-25	E	Drilling
Texaco, Inc.	West Kavik	E	Drilling

PRODUCTION - February, 1969 (Pressure base 14.65 psi)

<u>Field</u>	<u>Oil-Bbls</u>	<u>Water-Bbls</u>	<u>Gas-MCF</u>	<u>*No. of Hells Prod.</u>	<u>Cum. Oil</u>	<u>Cum. Gas</u>
<u>OIL FIELDS</u>						
Granite Point	707,268	19,147	488,307	33 (3)	21,655,130	16,100,843
McArthur River	1,880,908	24,700	536,096	33 (7)	26,360,053	7,498,719
Redoubt Shoal					1,596	456
Middle Ground Shoal	883,469	38,315	710,605	50 (9)	26,151,808	12,440,473
Swanson River	1,066,497	187,372	2,715,533	35 (14)	90,810,934	63,410,941
Trading Bay	626,299	7,584	423,419	22 (7)(a)	5,381,778	4,250,013
Total	5,164,441	277,118	4,873,960	173 (40)	170,361,299	103,701,445

L.P.G.

Swanson River (Propane) 5,148 15,331(b)

GAS FIELDS

Beluga River			278,755	2 (2)		2,766,581
Kenai (Incl. Deep Unit)			5,238,582	23 (1)		145,120,461
McArthur River			79,934	2		153,594
Moquawkie			37,880	1		489,082
Nicolai Creek			48,075	1		129,649
Sterling			24,941	1		841,578
South Barrow			56,284	3		4,000,536
Trading Bay	222	5	13,870	1	2,940	265,341
Inactive Fields						12,028,261
Total	222	5	5,778,321	34 (3)	2,940	165,795,083

STATE GRAND TOTAL 5,169,811 277,123 10,652,281 207 (43) 170,379,570 269,496,528

Average per day: Oil, 184,636 bbls; Csg. Head, 174,070 MCF; Dry Gas, 206,369 MCF;  
Total Gas, 380,439 MCF

\*Dual completions are included as two wells; triple, as three. ( ) Number of wells not producing in February.

(a) Corrected to include commingled NE Trading Bay Kenai-Hemlock as single wells.

(b) Started October, 1968. Not reported previously.

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Item	Description	Value	Unit
100	100	100	100
200	200	200	200
300	300	300	300
400	400	400	400
500	500	500	500

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