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DIVISION OF MINES AND GEOLOGY

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MINES BULLETIN

Published to Accelerate the Development of the Mining Industry in Alaska

August, 1969

Vol XVII
No. 8

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MINING NEWS

Klukwan Iron Deposits -- Several Japanese companies are interested in U. S. Steel's proposed joint venture in mining the Klukwan iron deposits. Various exploratory programs by the interested groups are being carried out at the present time, with the results dictating the future development of the deposit.

Alaska Barite -- Alaska Barite Company reported in a private communication that it has sold its barite operation. The purchaser was not disclosed but is believed to be International Minerals and Chemical Corporation. Alaska Barite has been mining the Castle Island deposit near Petersburg and processing the barite into oil well drilling mud at Kenai.

EXPLORATION

Akutan Native Reservation -- Roy Peratrovich, Superintendent, Anchorage Indian Agency, P. O. Box 120, Anchorage, Alaska, 99501 has issued a "Notice of Availability of Non-exclusive Mineral Prospecting Permits on the Akutan Native Reservation."

"The Native Village of Akutan has opened the Akutan Native Reservation to surface prospecting for sulphur and all other minerals except oil and gas, sand, and gravel. Non-exclusive mineral prospecting permits without lease option are now available at the Anchorage Indian Agency, P. O. Box 120, 1675 "C" Street, Kaloa Building, Anchorage, Alaska, 99501. The permits will be for a period of one year from the date of approval. Airborne explorations as well as surface prospecting are authorized, but bulldozing, drilling and excavation are not permitted.

The permit fee is \$50.00 and an acceptable surety bond in the amount of \$5,000 will be required. If exclusive mineral prospecting permits are approved at some later date, such permitted areas will be excluded from the nonexclusive permit at that time. A description of any excluded areas may be obtained from the Superintendent, Anchorage Indian Agency. About January 1970, an advertisement will be issued offering for competitive bids exclusive mineral prospecting permits with option to lease sulphur and all other minerals, except oil and gas, sand, and gravel. The delineation of the tracts to be offered for bid is presently undetermined and consideration will be given to nominations of areas by prospective bidders so long as the nominations are received at the Agency in sufficient time to give adequate consideration before publication of the advertisement. Bids will be opened on or before March 1, 1970.

The successful bidder on each tract will receive an exclusive prospecting permit covering the entire tract. Each exclusive prospecting permit will grant the right to do all necessary exploration work and will carry the right to leases of not more than 2,560 acres each within the permit area. The successful bidder may take as many leases as he wishes within each tract. The terms and conditions of the permits and leases will be available at the Agency by the time that the sale is advertised about December 1, 1969."

Annette Islands Indian Reservation -- The Superintendent of the Southeast Alaska Indian Agency, P. O. Box 1587, Juneau, Alaska, 99801, has issued a "Notice of Availability of Nonexclusive Mineral Prospecting Permits on the Annette Islands Indian Reservations."

"The Metlakatla Indian Community has opened the Annette Islands Indian Reservation to surface prospecting for gold, silver, copper, lead, barite and all other minerals except oil and gas, sand, and gravel.

Nonexclusive mineral prospecting permits without lease option are now available at the Southeast Alaska Indian Agency, P. O. Box 1587, Juneau, Alaska, 99801. The permits will be for a period of one year from the date of approval. Airborne explorations as well as surface prospecting are authorized. Prospectors will be allowed to strip moss, and do some drilling and excavating to a nominal depth, and that everything concerning mineral activity or prospecting on Annette Island shall be negotiated with the Council of the Metlakatla Indian Community.

The permit fee is \$25.00 but no surety bond will be required. If exclusive mineral prospecting permits are approved at some later date, such permitted areas will be excluded from the nonexclusive permit at that time. A description of any excluded areas may be obtained from the Superintendent, Southeast Alaska Indian Agency.

About January 1, 1970, an advertisement will be issued offering for competitive bids exclusive mineral prospecting permits with option to lease gold, silver, copper, lead, barite and all other minerals, except oil and gas, sand, and gravel. The delineation of the tracts to be offered for bid is presently undetermined and consideration will be given to nominations of areas by prospective bidders so long as the nominations are received at the Agency in sufficient time to give adequate consideration before publication of the advertisement. Bids will be opened on or about March 1, 1970.

The successful bidder on each tract will receive an exclusive prospecting permit covering the entire tract. Each exclusive prospecting permit will grant the right to do all necessary exploration work and will carry the right to leases of not more than 2,560 acres each within the permit area. The successful bidder may take as many leases as he wishes within each tract. The terms and conditions of the permits and leases will be available at the Agency by the time that the sale is advertised about January 1, 1970."

USBM MINING ENGINEER AT ANCHORAGE

The U. S. Bureau of Mines now has a mining engineer stationed at Anchorage. Mr. Robert Bottge has been transferred there from the USBM Mineral Resources Office in Minneapolis, Minnesota. His office is in the Federal Building, and his phone number is 277-4733. Mail will reach him at P. O. Box 2259, Anchorage, Alaska 99501.

NATIONAL MINING AND MINERAL POLICY

Senator Gordon Allott of Colorado and several other western Senators have introduced S. 719, which would establish a national mining and minerals policy.

The bill is short, simply stating:

"The Congress declares that it is the continuing policy of the Federal Government in the national interest to foster and encourage (1) the development of an economically sound and stable domestic mining and minerals industry, (2) the orderly development of domestic mineral resources and reserves necessary to assure satisfaction of industrial and security needs, and (3) mining, mineral and metallurgical research to promote the wise and efficient use of our mineral resources. It shall be the responsibility of the Secretary of the Interior to carry out this policy in such programs as may be authorized by law other than this Act. For this purpose the Secretary of the Interior shall include in his annual report to the Congress a report on the state of the domestic mining and minerals industry, including a statement of the trend in utilization and depletion of these resources, together with such recommendations for legislative programs as may be necessary to implement the policy of this Act."

PROPOSED LAND USE REGULATIONS

As most Alaska miners and prospectors know by now, the State Division of Lands has proposed new regulations under the heading of "General Land Use" which will impose certain restrictions on the use of State lands including prospecting and exploration activities. Commissioner of Natural Resources, Thomas E. Kelly, and Pedro Denton, Minerals Officer of the Division of Lands, are hoping for constructive criticisms and suggestions on these regulations before a formal hearing is held. These particular regulations will affect activities on State-owned lands only, but the Federal Bureau of Land Management also is known to be preparing similar regulations for Federal public domain. The proposed 48-inch oil pipeline from the Arctic has crystallized great public interest in preserving Alaska's environment to the largest extent possible, and the demand for regulatory measures toward this end has reached unprecedented heights. The proposed State regulations will apply to all users of State-owned land, not just prospectors, and are designed to protect against adverse effects on the natural environment as much as is practical.

Commissioner Kelly has expressed the desire that all interested parties comment on the proposals. He urges the mining fraternity to act constructively in this regard and recommend measures that it can live with. Otherwise, because of public demand, regulations will be enacted over which the miners will have had no voice. Copies of the proposal may be obtained from Mr. Pedro Denton, Minerals Officer, State Division of Lands, 306 W. Fifth Avenue, Anchorage, Alaska 99501.

USGS REPORT ON GOLD IN BERING SEA

The following "Abstract" and "Summary and Conclusions" are taken from the recently-released USGS open file report Sedimentary Processes and Distribution of Particulate Gold in Northern Bering Sea by Hans Nelson and D. M. Hopkins. The entire report (50 pages and 12 figures) is available for study (but not distribution) at the various Alaskan USGS and DM&G offices. It may be obtained at private expense only from the Alaskan Geology Branch, USGS, 345 Middlefield Road, Menlo Park, California 94025.

Abstract

"Except for nearshore regions, most of northern Bering Sea is remote from bedrock sources of gold onshore and insulated by Tertiary sediments from possible bedrock sources below the sea floor. However, land mapping, and study of seismic profiles, 51 offshore drill holes, and 700 surface sediment samples show that during times of lowered sea level, glaciers have pushed auriferous debris up to 5 km beyond the present shoreline of Seward Peninsula and as much as 100 km off Siberia. Sediment textures, gold content, and presence of washed gravels far from the present shoreline indicate that subsequent transgression and regression of the sea has reworked the exposed margins of the glacial drift and left relict gravel as a thin lag layer overlying the glacial deposits; this veneer is richly auriferous along parts of the southern Seward Peninsula coast. During transgression and regressions of the shoreline still stands developed beaches at about -36' and -70' and -80' in the Nome region. Small amounts of gold are found in surface samples of the beach gravel, and better concentrations may be present at depth. Streams have dissected the offshore moraines during periods of lowered sea levels, and gold concentrations are present locally in the resulting alluvium, but the gold concentrations generally are buried and have not been well sampled by the few scattered drill holes. Since the last rise in sea level strong nearshore currents have deposited sand, silt, and clay generally lacking gold, in the former stream valleys and in other topographic depressions; currents also have prevented the burial of auriferous relict gravel in nearshore regions of elevated topography and in offshore Chirikov Basin west of the Nome region.

"Gold flakes one mm or more in diameter are responsible for high gold values in relict gravel; the distribution of this coarse gold, as well as highest median values of panable particulate gold in local areas, provide evidence of the location of offshore gold sources. Gold flakes having diameters of one mm or more are essentially restricted to (1) areas in the vicinity of bedrock exposures on the seafloor, (2) areas near outcrops of mineralized material on land, and (3) areas where glaciers have carried detrital material en masse beyond the present shoreline. Small gold particles (ca. .25 mm or less) have been widely dispersed from these source areas by waves and bottom currents, but marine processes have not moved gold particles larger than 1 mm away from the source regions.

"The fine-grained bottom sediments of northern Bering Sea contain small quantities of fine gold. Regional median values of pannable particulate gold amount to a few tenths of a part per billion in most areas in the Chirikov Basin, but gold too fine to be recovered in a gold pan is also present in small quantities. Regional median gold values are higher near source areas.

"Statistical tests on gold values of samples from a restricted area of relict surface gravels over drift in the Nome region suggest that coarse gold flakes (more than one mm) are randomly distributed, that average tenor is 920 ppb, and that a potentially mineable reserve exists. Geologic setting, and distribution of coarse gold particles indicates that the most likely locations of other auriferous gravel deposits in northern Bering Sea are (1) in relict surface gravel on older buried auriferous drifts off Nome, (2) in basal gravel of ancient stream valleys and beaches cutting drift off Nome, (3) at the sea floor

in gravels over exposed bedrock near Sledge Island, and (4) on sea-floor exposures of moraines in northwestern Chirikov Basin, if they are auriferous. In general, offshore relict gravels deposited by shoreline or streams processes that rework glacial drift or bedrock sources with coarse gold, should contain significant concentrations of gold."

Summary and Conclusions

"Samples from 51 drill holes and about 700 surface sediment locations in northern Bering Sea show that gold is widely dispersed on the floor of the Chirikov Basin, northern Bering Sea. In the richest area near Nome, the bottom sediments have an average gold content of nearly 1,000 ppb and the predominant size of gold flakes is one mm in diameter; however, in most areas 75 percent of the samples contain one ppb or less of pannable particulate gold flakes ranging from about .25 mm to subvisible size. Because the richer areas contain coarser gold, the particle sparsity effect must be considered in gold poor as well as gold-rich areas. Our data indicates that about 25 kg (55 pounds) of sample are required in order to obtain a reliable estimate of the gold content of any type of sediment from northern Bering Sea. For samples of this weight, one may conclude with 95% confidence that the true gold content of the particular sedimentary environment that has been sampled, differs by no more than $\pm 50\%$ from the gold content of the sample itself (Clifton et al., 1969). To analyze such large sample quantities, even on shipboard, we suggest screening out the gravel fraction, which can then be studied for roundness and lithology to determine sedimentary environment; next elutriation can be used to remove silt and clay, and then the residue can be panned. Inadequate sample size, as in the case of our Nome nearshore samples, can be compensated for by calculating moving averages in homogeneous sedimentary environments. Comparison with statistical probability curves, generated for samples with low and variable weights, suggests that the average values are representative and that coarse gold can be randomly distributed within restricted areas of certain sedimentary environments. This statistical analysis provides a basis for preliminary evaluation of the economic potential for rich areas of homogeneous sediment.

"Over the total northern Bering Sea region distribution of gold values is not random, but is correlated specifically with sedimentary environments and location. The richest concentrations and coarsest particles (one mm or larger) of gold occur in relict gravels that mantle glacial drift lobes in the Nome nearshore region or in gravel patches over bedrock in the Sledge Island area. These bodies of relict gravel which are characterized by predominance of gravel and lack of silt and clay formed during transgression and regression of the shoreline when eustatic changes of sea level occurred in Pleistocene times. Relict gravels over outwash fans appear to have no concentrations of gold in their upper surface and contain only fine-size particulate gold. However, drilling suggests that local outwash channels buried in glacial drift and alluvial channels cut into the surface of the glacial drift can contain significant concentrations of gold. The submerged beach gravels, which are identified by their bathymetric location, and pebble roundness and lithology, contain coarse gold; although concentrations of gold in surface samples are significantly lower than those of relict gravels over drift, the gold content may be greater in the buried back beach deposits. Except along the present shoreline, Holocene sands and muds throughout most of northern Bering Sea usually contain just occasional fine-sized gold flakes (.25 mm or less in diameter) and have no concentration of particulate gold. The total amount of gold in sediments with no gold concentration appears to be about 10 ppb, with half or more of the gold content contributed by subvisible and included gold. Because gold panning does not retain subvisible and included gold and because few whole sediment samples have been analyzed, total background gold content of Chirikov Basin sediment is not well established and cannot be used for comparative relations. Nevertheless, the restricted gold content of pan concentrates can be used to establish a relative and comparable background of pannable particulate gold. When median values of the cumulative frequency distribution of pannable particulate gold values of local regions are

compared, gold source regions and distribution processes can be characterized. Trends toward higher median values of pannable particulate gold and slightly coarser gold in the bottom mud near the Seward Peninsula coast point to the Nome-Sledge Island area as a major source for the gold dispersed in the finer sediments of northern Bering Sea. Local source regions can be identified not only by the gradation to larger median values in local regions surrounding them but also by median gold values of local source areas that are about 10 times or more than those of normal local regions (ca. .2 ppb or less) and by gold particles of one mm or greater in diameter that remain in the source region.

"Lack of movement of gold particles one mm or more in diameter indicates that coarse gold is not transported beyond the source regions by normal marine processes. Either bedrock sources of gold must be present offshore, or mass transport mechanisms of glaciers must have carried the coarse gold offshore; although, modern-day ice rafting, in rare instances, seems to have dropped coarse gold into offshore fine sized sediments that lack gold but contain rafted pebbles. Fine gold apparently can be widely dispersed from source regions by marine processes. Theoretically, the strong currents known to exist in the nearshore regions should be able to carry the fine gold. However, sediments recently deposited from currents generally lack visible gold; and, relict sediments, apparently laid down by Holocene transgression of the shoreline across the Bering Sea, often contain fine, visible gold. This suggests that longshore drift is mainly responsible for dispersal of fine gold particles throughout surface sediments of northern Bering Sea. Absence of gold concentration, but presence of fine, visible gold in nearly half the samples of relict gravels east of the Nome region, where eastward longshore drift has predominated, again confirms the idea that longshore drift is mainly responsible for dispersal of fine gold.

"The main conclusion that can be drawn from the gold distribution relationships is that, as in the land placers at Nome, shoreline processes have been most critical for gold concentration and dispersal in Chirikov Basin. The modern currents also have been important for they apparently prevent recent sediment deposition over much of northern Bering Sea, and consequently, relict auriferous sediments laid down by the last shoreline transgression remain exposed at the sea bottom. In the limited locations where old depressions, particularly stream valleys, have been filling with recent current-deposited sediment, little visible gold is found. Where the wave processes of the shoreline transgression have reworked auriferous till, very rich concentrations of coarse gold have remained in the thin layer of relict gravels on the surface of the sea bottom.

"It appears that a potentially mineable deposit is present in the mantle of relict gravels over drift off Nome, and that other prospects merit detailed sampling as possible additional gold resources. Statistical analysis for the richest six square mile area of the highly auriferous relict gravels indicates that coarse gold distribution is random, that samples are representative, and that the gravel averages 920 ppb in gold. Particles of a millimeter or more in diameter are mainly responsible for gold tenor in the relict gravels over glacial debris, however, this may not be the case for the submerged beach ridges. Trace-sized gold (.3 mm or less) accounts for values greater than 10,000 ppb in ruby sands of the modern beach and often is the size mode of ancient emergent beaches that were mined on land. Although coarse gold and high background values suggest that there are gold concentrations in submerged beach sediments, only relatively low gold values were encountered. These low values may be misleading because buried locations, such as at the base of the back beach where the concentrations would be expected, have not been sampled. Very closely spaced drilling and vertical sampling increments would be necessary to detect such deposits, which are most likely to occur where inner beaches have been cut into auriferous till. The coarse gold and high background values in gravel patches over seafloor bedrock of the Sledge Island region indicate a possible offshore bedrock gold source; this area as well as the gravel shoal to the northwest are other promising areas for gold exploration.

In addition, confirmation of the presence and possible economic potential of coarse gold and (or) native copper in morainal gravels off St. Lawrence Island is recommended.

"In regions of relict sediments, it is apparent that gold content of surface samples can identify and outline placer accumulations of gold in surface and underlying materials. However, where there is a cover of recently deposited fine-sized or muddy sediment which generally lacks gold values, underlying deposits may be masked. The recent muddy sediments of the nearshore region off Bluff usually lack gold, yet presence of coarse gold has been confirmed in a buried offshore channel. Buried placers also may be present off the mouth of the Solomon River, but samples of the surficial relict gravels there are very discouraging. Most of the central part of Chirikov Basin is not an encouraging place for further prospecting, because the bottom sediments are fine grained and bedrock that might furnish local sources of gold lies buried beneath many hundreds of feet of Cenozoic sediments. Although subvisible gold adds significantly to background values of normal sediments of northern Bering Sea, and it is more abundant in rich samples, very low total content of subvisible gold does not justify its consideration as a mineable resource."

NEW PUBLICATIONS

The following open file reports have been released by the U. S. Geological Survey and are available for consultation in the Alaska USGS and State Division of Mines and Geology offices. Material from which copies of these open file reports can be made at private expense is available at the Alaska Geology Branch, USGS, 345 Middlefield Road, Menlo Park, California 94025.

Preliminary geologic map of the Coleen Quadrangle, Alaska, by W. P. Brosge and H. N. Reiser, 1 map, explanation, tables (1 sheet), scale 1:250,000

Mafic and ultramafic rocks from a layered pluton at Mount Fairweather, Alaska, by George Plafker and E. M. MacKevett, Jr., 10 p, 2 tables, 1 fig, 1 photograph

Airborne radioactivity and total intensity magnetic survey of the southern Kobuk-Selawik lowland, Western Alaska, by Thomas P. Miller and Lennart A. Anderson, 6 p, 3 figs, (6 sheets)

Preliminary geologic investigations in the Kanuti River region, Alaska, by William W. Patton, Jr., and Thomas P. Miller, 11 p, 4 figs

Preliminary geologic interpretation of aeromagnetic data in the Nixon Fork district, Alaska, by Lennart A. Anderson, Bruce L. Reed, and Gordon R. Johnson, 6 p, 1 pl, 1 fig, scale 1:63,360

Availability of petrographic thin-sections of the Lisburne group from Northeastern Brooks Range, Alaska, by Augustus K. Armstrong, 1 sheet

Reconnaissance geologic maps and sample data, Teller A-1, A-2, A-3, B-1, B-2, B-3, C-1, and Bendeleben A-6, B-6, C-6, D-5, D-6 Quadrangles, Seward Peninsula, Alaska, by C. L. Sainsbury, Reuben Kachadoorian, Travis Hudson, T. E. Smith, T. R. Richards, and W. E. Todd, 60 p, incl. 12 p tabular material (2 tables), 12 maps, 1 explanation. Also on file in District Court, Post Office Building, Nome, Alaska

E. AND M.J. METAL MARKET PRICES

	<u>July 21</u>	<u>Month Ago</u>	<u>Year Ago</u>
Copper, per lb.	45.9¢	45.9¢	42¢
Lead, per lb.	15.5¢	15.0¢	13¢
Zinc, per lb.	14.5¢	15.0¢	14¢
Tin, per lb.	161.45¢	159.7¢	143.1¢
Nickel, per lb.	\$1.03	\$1.03	94¢
Platinum, per oz.	\$120-125	\$120-125	\$109-114
Mercury, per flask	\$510-515	\$485-495	\$538-550
Antimony ore, per unit	\$8.75-8.93	\$8.21-8.39	\$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.	\$1.72	\$1.72	\$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.	164.9¢	156.2¢	240.8¢
Gold, per oz.	\$42.35	\$41.40	---
Barite (drilling mud grade from E/MJ May)	\$12-16	\$12-16	---