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William A. Egan - Governor Charles F. Herbert - Commissioner
William C. Fackler - Assistant Commissioner for Minerals

GEOLOGY AND MINERAL DEPOSITS OF KODIAK ISLAND

(By Gilbert R. Eakins - Geologist)

The records of prospecting and exploration are very incomplete, and the mineral potential of Kodiak Island remains largely unknown. However, the old beach gold placers, minor occurrences of lode gold, platinum, copper and tungsten, and the presence of numerous intrusives suggest that commercial mineral deposits may be present. The Alaska Division of Geological Survey recognizes the need for detailed geologic mapping in the area and hopes that some future programs will be able to include Kodiak Island. Reasons for inadequate mapping are the ruggedness of the terrain, dense vegetation, soil cover, heavy rainfall, and possibly the reputation of the huge Kodiak bears.

The geology of the Kodiak group of islands is believed to be a continuation of the Kenai Peninsula and the Kenai Mountains. The structural trends of the bedded rocks, major faults, and larger intrusives are northeast. The dips are generally northwest. Mapping by the U. S. Geological Survey (Moore, 1967) shows a major thrust fault extending the length of Kodiak Island near the northwest coast. A normal down-to-the-coast fault parallel to the general northeast trends extends the length of the island along the southeast side. The rocks are foliated and metamorphosed as a result of stresses.

The country rocks are mostly Jurassic and Cretaceous slate, graywacke and greenstone, with minor conglomerate, chert and limestone. Small areas of poorly consolidated Tertiary sediments lie along the southeastern margin of the island and may extend south some distance beneath the Pacific. Pleistocene glaciers once covered the entire area, except for the highest peaks, and glaciation has had a strong influence on the present-day topography and Quaternary sediments.

Volcanic ash from the 1912 eruption of Mt. Katmai formed a thick blanket over much of Kodiak Island, but the material has since largely been washed into the stream valleys and bays, where it is still abundant.

The metasediments are cut by numerous early Tertiary intrusive bodies, the largest being an elongated granodiorite mass, which extends the length of the island for 68 miles and is up to 12 miles wide (Moore, 1967). Many smaller outlying intrusives of dioritic to granitic compositions are present. Acidic dikes and associated quartz veins are also common. Ultramafic intrusives are present near the west coast, west of the thrust fault, at several localities from Middle Cape north to Uganik Bay.

Continuing earthquakes and the apparently raised coastal plains on Kodiak Island suggest recent elevation of the coastal areas. Strong earthquakes in 1912, supposedly related to the Mt. Katmai eruption, disturbed the bluffs, displaced adjacent blocks of ground 3 feet, and opened cracks up to one foot in width. The Good Friday earthquake of 1964, on the other hand, caused up to 5 1/2 feet of subsidence at the northern part of Kodiak Island.

The date that the first prospecting or mining was done on Kodiak Island is not known, but it was sometime late in the 19th century. Becker (1898) made a brief description of the placer mining on the beaches as witnessed by him during an early visit to the area.

The only mineral production of any consequence to date on Kodiak Island has been from the gold placers in the beach sands along the northwest and southwest shores. The deposits have been small, transitory occurrences formed by wave action which concentrated gold derived from Quaternary gravel or glacial till that forms the cliffs along the coasts. Maddren (1919) believed that glaciers moved gravels and fine surface materials from the interior where numerous small quartz veins carrying a little gold cut the slates and graywackes. Postglacial wave action has eroded the gold-bearing till and glaciofluvial deposits on the coast and concentrated placer gold along the short beaches near the river mouths. The gold was shifted about from day to day, depending upon the tides and storms. Maddren estimated that up to 100 men may have been working the deposits at one time. The usual operation consisted of two or three men working together using rockers or sluice boxes to which they fed water from the cliffs through canvas hoses. Maddren (p 229) estimated the total production from these placers by 1919 to have been between $50,000 and $150,000.

The chief minerals found with the gold from the beaches are magnetite, pyrite, chromite and a little platinum. Magnetite is by far the most abundant. The platinum and chromite were derived from the ultramafic intrusives near the west coast. No placer gold has been discovered in commercial amounts in streams on the interior of the island, probably because of the relatively recent glaciation.

Several attempts have been made to mine gold from quartz veins near the west side of the island, but the grade was too low for successful operations. The most productive property was the Amok claim at Uyak Bay from which a minimum of $8,000 was recovered (Berg and Cobb, 1967, p 83). Several hundred feet of underground workings were mined and two mills erected. Irregular quartz stringers near a graywacke-diorite contact at a prospect on Uganik Passage is said to have yielded assays of $7.60-11.67 per ton, but most values for the lodes in the region were much lower. The most promising areas for prospecting for gold or silver are near the contacts of the intrusives and adjacent sediments.

Tungsten occurrences about 10 miles north of the town of Kodiak near the head of Anton Larsen Bay have been investigated by several mining companies. The geology of the area was examined by the Alaska Division of Mines and Minerals (Rose and Richter, 1967) and the U. S. Geological Survey (Seitz, 1963). Scheelite was found as disseminated grains and fine veinlets in quartzitic zones in graywacke and as thin coatings on quartz veins and fractures. The conclusions were that the deposits were not commercial. Rose and Richter (1967, p 10) believed, however, that nearby gold veins, while of low grade, might have possibilities.

A copper prospect, called the Old Harbor copper lode, located on the northwestern side of Sitkalidak Island was prospected by short adits and trenches before World War II. A vein containing pyrite, pyrrhotite and chalcopyrite extends at least 2,500 feet. Scattered, selected sampling yielded assays ranging from 0.09 percent copper to 5.52 percent. The U. S. Bureau of Mines in 1944 concluded the deposit was not commercial at that time (Berg and Cobb, 1967, p 88).

The ultramafic intrusive rocks on the western side of Kodiak Island are similar to the rocks on the southern end of Kenai Peninsula which contain minable lenses of chromite, as at Clam Point and Red Mountain, which together are estimated to contain a reserve of 400,000 tons of chromite.

A projection of the tectonic belt containing important mercury deposits in California through structural trends extending through Kodiak Island could conceiveably add this mineral to the possibilities.

Coal, while not of economic importance, is present in thin seams a few inches in thickness in Tertiary sediments on the eastern side of Kodiak Island. Thicker beds of coal are present on Sitkinak Island, one of the Trinity Islands near the southern end of the Kodiak group. One short seam of limited extent is reported to be 10 to 12 feet thick (Martin, 1913, p 136).

Two other possibilities for resource development might be considered. One is that placer gold could perhaps be found offshore under the Shelikof Strait along submerged shorelines off Kodiak Island. Deposits of this type are being actively explored by major companies from Nome to Goodnews Bay. The other possibility which could have an economic influence on the area is that of offshore petroleum exploration of the probable Tertiary marine sediments under Shelikof Strait and the extension southward of the Cook Inlet petroleum province (Miller, Payne and Gryc, 1959, p 26-37). Also the Gulf of Alaska Tertiary offshore on the southeast side may eventually be found to contain petroleum.

Geologic studies combined with modern exploration techniques may yet reveal important mineral or petroleum resources in the Kodiak region.

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NEW KETCHIKAN OFFICE SERVICES

Commissioner Charles F. Herbert, Department of Natural Resources, is expanding the Departmental service to the public in the Ketchikan area. The Mining Information Office in Ketchikan will now disseminate Division of Land information and act as liaison with the Southeastern Land District Office in Juneau in addition to the previous mineral information and services of the Alaska Division of Geological Survey. The office is operated by Mrs. Geraldine Zartman, Mining Information Specialist and is located at 306 Main Street (Room 812) in Ketchikan. Mailing address is P.O. Box 2438, Ketchikan, Alaska 99901.

NEW DIVISION PUBLICATION

The Alaska Division of Geological Survey, Department of Natural Resources, has released Geochemical Report No. 24 and a bibliography as follows:

Analyses of rock and stream-sediment samples Hetta Inlet area, Prince of Wales Island, Craig quadrangle, Alaska by Gordon Herreid.

Bibliography of Alaskan Geology 1831-1918 by Crawford E. Fritts and Mildred E. Brown.

These reports cost $1.00 and may be obtained from the Division of Geological Survey offices located at College Road and University Avenue, College; 323 East 4th Avenue, Anchorage; 509 Goldstein Building, Juneau and National Bank of Alaska Building, Ketchikan.

SEARCH OK IN ALASKA

(Western Mining News 1/7/72)

The Alaska Native Claims Settlement Act, as finally passed by Congress, will permit continuation of the search for metalliferous minerals, the American Mining Congress has informed members. The Senate and House bills as first passed would have withdrawn all unreserved public lands in Alaska from all forms of appropriation under public land laws, including the mining and mineral leasing laws, it said. The withdrawal would have been for an indefinite period while the lands were classified for use planning.

Following protests by the AMC and the Alaska Mining Association, the Senate and House recently approved a conference report which specifically exempted metalliferous mining entries from the freeze, the report said.

AFN CLOSING WASHINGTON, D.C. OFFICE
(Alaska From The Inside 12/28/71)

Now that the land-claims fight is over, the Alaska Federation of Natives reportedly has decided to close its money-draining office in Washington, D.C. The office, established primarily for the AFN's major lobbying effort, was in a hotel near the Capitol. For now, AFN representatives will work out of the Tribal Association office in Washington, D.C.

BLM-STATE SIGN FOREST FIRE AGREEMENT
(Daily News Miner 1/18/72)

Officials of the State of Alaska and of the Bureau of Land Management Friday signed a newly revised state-wide cooperative fire protection agreement. BLM Alaska State Director Curtis V. McVee and Alaska State Commissioner of Natural Resources Charles F. Herbert signed the agreement in Anchorage providing fire protection on state and private lands.

Since June 1960 BLM has been under contract to handle fire suppression on state and private lands in Alaska. Additionally, BLM provides protection for more than 270 million acres of federal public domain lands in the state. In the past it was solely BLM's job to control fires, on state land as well as on federal land. Under the new agreement, to run through the end of 1972, BLM will assist the state while the state begins to move toward protection responsibility for larger areas of the state lands. "BLM will continue to assist the state, when requested, in handling major fire problems on all of these lands," said BLM State Director McVee. Commissioner Herbert stated that this cooperation between BLM and the State of Alaska over the years "has proven valuable in many ways. This plan," added Commissioner Herbert, "is the best yet and should aid materially in reducing fire damage throughout the State and in assuring the development of remote sections of Alaska whose future has always heretofore been subject to the threat of forest wild fires."

BARTHOLOMAE MINE SET FOR WORK AGAIN
(Oil and Resource Review 12/28/71)

After some 30 years of dormancy, gold mining is set to resume on the Bartholomae Mining Co. property on Henderson Road near Fairbanks. The property, 1,000 acres of it, is owned by Sara Bartholomae and the development is being spearheaded by Michael DeLuca, a trustee of the Bartholomae estate. DeLuca noted that gold miners in the past had sunk several shafts in a hardrock operation but now, he believes, he's going to concentrate on surface mining. The mine was purchased by Bill Bartholomae from Anaconda in 1939 and worked by him through 1942 when operations were discontinued. Bartholomae began his career with nothing as a young man in New York. He gradually worked his way up in the oil business, building the Bartholomae Oil Co. Before his death, he had amassed a fortune of some $22 million, DeLuca said.

The proposed venture at the Fairbanks site will be a small, "family" operation DeLuca said. There's an old ball mill on the property which may be rejuvenated or, possibly, a small ball mill may be brought in by truck to handle ore. In addition to the Fairbanks property, the Bartholomae estate also owns Sullivan City, an extensive but discontinued gold mining operation 75 miles from Nome. While a great amount of money was taken from the Sullivan City mines, DeLuca said, nothing of any note has ever come out of the Fairbanks operation. DeLuca has been traveling to Fairbanks each year to keep up the assessment work required on the mine. This year he's also laying the groundwork so operations can begin as soon as possible in the spring. This includes conferring with local mining experts for advice on how to proceed. He's open to suggestions, he noted and said any person who might be able to help out could contact him. His home address is 20652 E. Fifth Ave., Walnut, Calif., 91789. His home phone is area code 714, 595-5774.

MINING
(Alaska From The Inside 12/28/71)

Terms of the Native Land Claims settlement, being more favorable to mining interests than many had anticipated in recent months, should boost the industry's outlook in '72. Alaska, virtually untapped in terms of mining, can go nowhere but straight up. Look for a production decision in '72 at the important Lost River line, continued environmental battles, steady exploration ventures and, in the wake of the claims act, a more precise defination of mining's future in Alaska.

ALASKA SIGNS PACT ON RESOURCES DEVELOPMENT
(U.S. Maritime Monthly 12/15/71)

Alaska Governor William A. Egan has announced the signing of a state agreement with the Department of Interior launching a planning program for the orderly use of northern Alaska's natural resources.

Under the agreement, the governor said, a 15-member team of state and federal land and resource management specialists are initiating a land-use study covering some 200 million acres. The agreement was signed for the state by Commissioners Max Brewer, Department of Environmental Conservation; Charles F. Herbert, Department of Natural Resources; and Wallace H. Hoerenberg, Department of Fish and Game, and for the Interior Department by Curtis V. McVee, Alaska director for the Bureau of Land Management (BLM).

Governor Egan called the cooperative planning effort "a landmark in state-federal relations" and said, "This joint approach in planning the future of northern Alaska presents an opportunity not utilized in the development of any other state in what natural resources we have to work with and how they can be utilized reasonably and safeguarded to provide the greatest benefit for this and future generations."

The agreement was entered into under enabling legislation recently signed into law by the President, which required that the state provide $175,000 to match $350,000 in federal funds. The state has surpassed this requirement, as Governor Egan has authorized $193,000 as the state's share of the planning project for the northern region.

In the agreement, the State and the Interior Department recognize "the need for close cooperation in the development of land use and natural resource policies and plans throughout Alaska" and their "mutual desire to enter into an agreement for the beginning of a joint inventory and planning effort in northern Alaska."

The agreement emphasized BLM responsibility for "developing a general land use policy plan for public lands in northern Alaska to guide intelligent land use decisions on how the public lands and resources will be used, developed, and protected to promote orderly growth while maintaining a quality environment."

It stresses state responsibility for "coordinating all natural resources and land use planning in Alaska and with actively gathering information on land and water resources and making plans for land use, classification, and state selection of BLM lands."

Alaska, the governor said, "welcomes the cooperation of the Department of Interior and other federal agencies in this planning endeavor.

His statement was endorsed by McVee. "An understanding of the resources we have to work with," McVee said, "will permit us to open public discussion of northern Alaska in the full light of factual information so that federal, state, and private actions in the future can work from basic knowledge rather than from conjecture or suposition."

ALASKA SIGNS PACT ON RESOURCES DEVELOPMENT (continued)

The team's initial conclusions are expected within two years. Final acceptance of its reports and recommendations will rest with the Governor of Alaska and the Secretary of Interior.

The state contingent of the team will be headed by Theodore G. Smith, director of the Alaska State Division of Parks. Federal team leader for the project will be Larry Ouellette, planning and coordination staff leader for the BLM in Alaska.

The joint state-federal team will include a geologist, hydrologist, civil engineer, outdoor recreation planner assisted by a realty specialist and park planner, marine biologist, range conservationist, cartographer, and clerical assistants. Professional staff members for the federal government's participation are being selected from bureaus within the Department of Interior and from other Federal agencies having special expertise in the resource areas involved.

Other team members will include a forester, four biologists and a mining engineer from the State of Alaska. The team will turn to universities and others, through contract arrangements for sociological, archeological and other specialized study needs as the work moves forward.

Many interest groups are to be consulted for ideas and information about northern Alaska lands and resources, Governor Egan said.

BEAR CREEK MINING ACTIVE IN ALASKAN EXPLORATION
(U.S. Maritime Monthly 12/15/71)

SPOKANE--At least 30 mining and oil companies prospected for minerals in Alaska during 1971 according to the commissioner of Alaska's Department of Natural Resources, C. F. Herbert

This was in marked contrast to the nearly 20 years which followed the end of World War II when mining companies did little "grass roots" prospecting, he said in a paper presented at the recent Northwest Mining Association convention in Spokane.

This year's prospecting activity was marked by a general shift from reconnaissance work and surface prospecting to drilling, the visitor from Juneau said. At least 19 companies had drilling projects, he said, and they spent an estimated $10 million.

Bear Creek Mining Co., which had its headquarters in Spokane, was described by Herbert as "the most active exploration company in Alaska." The exploration subsidiary of Kennecott Copper Corp. is carrying out an intensive drilling program at its Arctic Camp copper discovery and apparently has developed a large tonnage of ore, he said.

In the Glacier Bay National Monument, Newmont Mining Co., Cities Service and the Union Pacific Railroad have drilled what is described as "the most significant nickel-sulfide deposit in the United States" and plans to bore a three-mile tunnel from which to complete development drilling.

In the Central Alaska Range, Cities Service, Tenneco and Dome Mining have developed an attractive, high grade copper deposit, Herbert said. More than 30 million tons of fluorite have been developed at the old Lost River tin mine on Seward Peninsula, he said.

U.S. MINES PRODUCTION HIGH IN '71
(Western Mining News 1/7/72)

The Interior Department said last Friday the United States mineral production in 1971 totaled some $30.1 billion, a new record. The value of metals produced declined, according to preliminary information from the Bureau of Mines, but that of fuels and nonmetals such as coal, petroleum and natural gas, gained. The total value of mineral production was estimated at $282 million above 1970. For metals the figure was $3.2 billion, down $562 million from 1970; for nonmetals, almost $27 billion, up $844 million.

INTERIOR PROTECTS ALASKA CORRIDOR
(Western Mining News 1/14/72)

The Department of the Interior has issued a public land order withdrawing more than 5 million acres to establish a utility and transportation corridor between Alaska's North Slope and the Port of Valdez. The action, taken in cognizance of Section 17(c) of the Alaska Native Claims Act, withdraws land most of which for the past two years was the subject of a proposed classification under the old Classification and Multiple Use Act. The lands within the corridor are excluded from selection by the State of Alaska and by Alaska Natives or Native groups, as well as from homesteading, purchase, mineral leasing, and appropriation under other disposal laws. In more than 2 million acres, described as the "inner corridor," the location of mining claims is prohibited, but this activity is allowed on the remaining lands included in the withdrawal order.

ENGINEER DEVELOPS NEW GOLD RECOVERY METHOD
(The Mining Record 1/5/72)

NEW YORK--Even at the new gold price of $38 an ounce, mining and smelting gold is likely to remain a marginal business, many people believe. But a California engineer says he has developed a new direct smelting method that will recover gold from ores or even from beach sands much more cheaply and without huge furnaces that pollute the air.

Sam Freedman, an ex-naval officer and electronics equipment manufacturer of Santee, Calif., has been trying to interest the big smelting companies in his new direct smelting method for copper, silver, gold and other metals for several years. Freedman, who manufactures electronic equipment for geophysicists, says his method is simple, but unbelievable to metallurgical engineers. He claims that miners and others who have seen the method are convinced it works. He adds that the question is, can it be made to work on a big enough scale to have a serious impact on the world's production of metals.

The Treasury Department has gone to the extent of giving him a license to smelt and trade in gold refined from ores. Freedman's method of direct smelting of ores consists of submerging the ore in a molten bath of fluxless aluminum solder. The reaction sets the ore ablaze and separates the metals. The details are rather technical to explain, but Freedman says he can handle five to 10 tons of ore hourly in a furnace only 10 feet long at a tiny fraction of the cost of conventional smelting. Having failed to enlist the aid of the big companies, Freedman is considering establishment of a miners' cooperative smelter at Lovelock, Nev., to provide the potential of his process.

Metallurgists of the big smelting companies have told Freedman they believe his process thermodynically impossible, at least for large-scale operations. But Freedman insists he is right and that sooner or later his process may revolutionize the smelting of many metals. (Freedman addressed a session of the Colorado Mining Association convention two years ago, explaining his methods.)

CAN MERCURY NEWS GET ANY WORSE
(Metals Week 1/3/72)

Mercury received some more negative publicity -- this time from Edwin Wilmsen, curator of the University of Mighigan's Museum of Anthropology. Reporting the museum's archaeological findings to the 138th annual meeting of the American Assn. for the Advancement of Science, Wilmsen said that fish have concentrated mercury in their tissues for tens of centuries, stressing that continual discharges by man of even small addition amounts could have serious effects on human and animal life. Meanwhile, the market remained extremely quiet last week, as the New Year approached. METALS WEEK is lowering its quote slightly to $216-218 from $218-222 the previous week.

INTERIOR DEPARTMENT POSTPONES EFFECTIVE DATE FOR INSTITUTING NEW PROCEDURES FOR OPERATIONS ON FEDERAL LANDS
(Department of the Interior 12/30/71)

The Department of the Interior has ordered a 90-day postponement for instituting its proposed new procedures for processing permits for exploratory drilling and mining plans on Federal lands.

The procedures were to have gone into effect January 1, 1972, but the date has been postponed at least until April 1, 1972, so that the Department may receive and consider additional public comments, Interior Secretary Rogers C. B. Morton explained.

Wide public interest led to the decision to postpone the effective date after the Department announced the proposed procedures in a press release on November 12, 1971, the Secretary said.

Designed to assist the U.S. Geological Survey of the Department of the Interior in protecting the environment, the new procedures would be applicable to public domain lands but not the Outer Continental Shelf. The drilling operations would cover wildcat, exploratory tests in search of petroleum, natural gas, geothermal steam and mineral deposits.

The proposed procedures would require the Geological Survey office in which the application for permit or request for approval is filed to post a notice on receipt of the application or request giving the location and general nature of the application and to withhold approval thereof for the 30-day period allowed for comments.

Based on the comments or its own investigation, the Geological Survey would determine whether to grant a permit to conduct operations on the land or to require the preparation of an environmental impact statement under the National Environmental Policy Act of 1969.

In postponing the effective date of the new procedures, the Department has published a notice in the Federal Register inviting additional comments. Comments should be submitted by January 31, 1972, and be addressed to the Director, U.S. Geological Survey, GSA Building, 18th and F Streets, N.W., Washington, D.C. 20242.

DIVISION OF GEOLOGICAL SURVEY AEROMAGNETIC SURVEY MAP SALE

The 23 sheets of the Nabesna Quadrangle portion of our East Alaska Range Aeromagnetic Survey were placed on sale December 21. The remaining 66 sheets of portions of the Tanacross, Gulkana, Mt. Hayes, Healy, and Fairbanks Quadrangles will be placed on sale Fedruary 9. It is expected that printing of the 60 aeromagnetic survey maps of the Seward Peninsula area will be completed in time for a sale on February 29 and that printing of the 53 aeromagnetic survey maps of the Goodnews-Platinum area will be completed in time for a sale of those maps on March 15.

State of Alaska
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL SURVEY
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METAL MARKET

Metals	Jan. 24, 1972	Month Ago	Year Ago
Antimony ore, stu equivalent European ore	$8.64-9.92	$8.64-10.00	$12.08-14.73
Barite (drilling mud grade per ton)	$18-22	$18-22	$12-16
Beryllijm powder, 98%, per lb.	$54-66	$54-66	$54-66
Chrome ore per long ton	$25-27	$25-27	$31-35
Copper per lb.	52.3¢	50.3¢	50.3¢
Gold per oz.	$46.25	$43.67	$37.70
Lead per lb.	14.0¢	14.0¢	13.5¢
Mercury per 76# flask	$215-225	$228-238	$348-355
Molybdenum conc. per lb.	$1.72	$1.72	$1.72
Nickel per lb.	$1.33	$1.33	$1.33
Platinum per oz.	$110-120	$120-125	$120-135
Silver, New York, per oz.	149.9¢	141.2¢	158.3¢
Tin per lb.	171.6¢	173.5¢	161.2¢
Titanium ore per ton (Ilmenite)	$30-35	$30-35	$30-35
Tungsten per unit	$55.00	$55.00	$55.00
Zinc per lb.	17.0¢	17.0¢	15.0¢