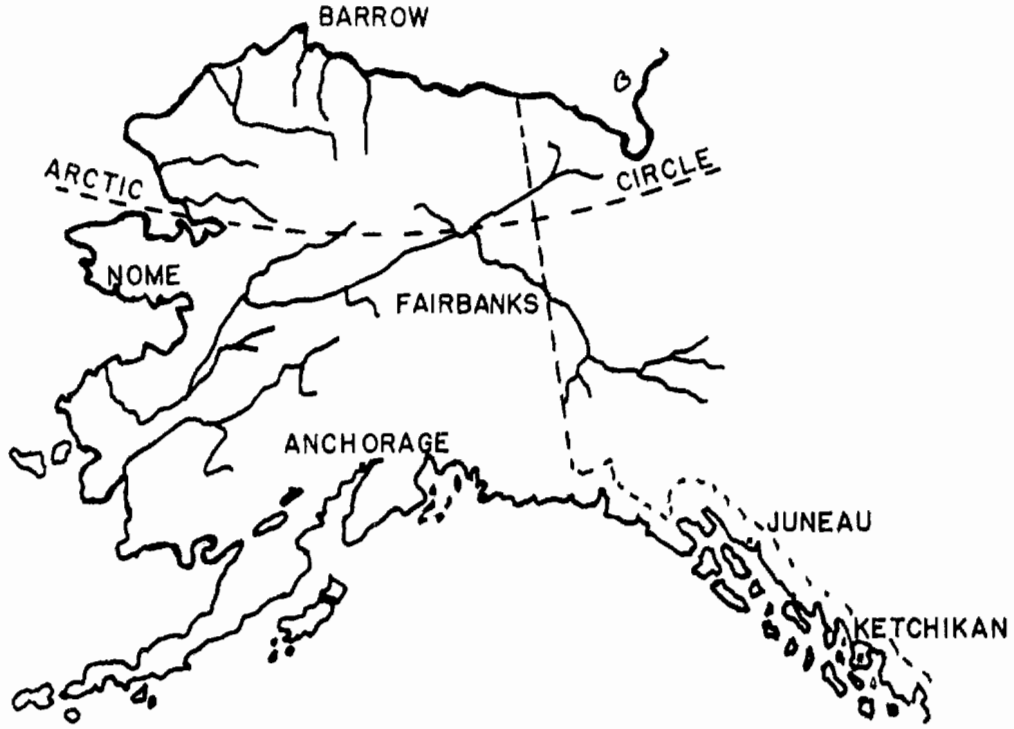
STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES



DIVISION OF MINES AND MINERALS

REPORT
FOR THE YEAR

1965

JUNEAU ALASKA

STATE OF ALASKA

William A. Egan - Governor

Department of Natural Resources

Phil R. Holdsworth - Commissioner

DIVISION OF MINES AND MINERALS

James A. Williams - Director

REPORT

FOR THE YEAR

1965

Juneau, Alaska

DIVISION OF MINES AND MINERALS STAFF

December 31, 1965

Headquarters Office, Box 1391, Juneau

James A. Williams, Director
William H. Race, Mining Engineer
Mildred E. Zenger, Administrative Assistant
Dorothy C. Mihelich, Mineral Analyst
Odelia Maciel, Secretary

Anchorage District Office, 3001 Porcupine Drive

Martin W. Jasper, Mining Engineer
Gordon Herreid, Mining Geologist
Donald H. Richter, Mining Geologist
Arthur W. Rose, Mining Geologist
Karl L. VonderAhe, Petroleum Engineer
Thomas R. Marshall, Jr., Petroleum Supervisor
Bobby Jo Brasch, Office Manager
Kathryn E. Perez, Clerk-Typist

Fairbanks District Office, Room 105, State Office Building

Robert H. Saunders, Mining Engineer
Willow M. Burand, Engineer-Assayer

College Assay Office, Room 102, Eielson Hall, University of Alaska

Donald R. Stein, Assayer

Honorable Phil R. Holdsworth, Commissioner
Department of Natural Resources
Juneau, Alaska 99801

Dear Sir:

It is a pleasure to transmit to you this Annual Report of the Division of Mines and Minerals covering the calendar year 1965. Summaries of mineral production, exploration, and developments during the year are outlined in the report. Data in other fields over which the Division has jurisdiction are included. The activities and accomplishments of the Division are outlined, and our geological investigations and petroleum regulatory work are briefly described.

This was the most significant year for Alaska's petroleum industry since the discovery of the Swanson River Field in 1957. Several oil and gas fields were discovered, drilling started from the first permanent offshore platform, contracts were let for several more such platforms, and the second oil field (first offshore) was put into production. More than $71,000,000 was spent by the industry in Alaskan exploration and development, exclusive of platform and repressuring costs.

Continuing high metal prices, rapidly increasing exploration work by major mining companies, and increased inquiries from all quarters show that mining is reviving in Alaska.

Direct revenue to the State from minerals totaled approximately $27,000,000 in 1965, nearly double that in 1964. Better years lie immediately ahead.

This Division will continue to foster and assist the growth of the minerals industries.

Respectfully submitted,

James A. Williams

James A. Williams, Director
Division of Mines and Minerals
Box 1391, Juneau, Alaska

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THE MINING INDUSTRY

Mineral Production

Mineral production in 1965 increased 26% from that of 1964 largely as a result of increased sand and gravel production in both quantity and value per ton. Total mineral production during 1965 is estimated at $82,274,000 compared to $66,091,000 during 1964. (See Table I). Coal production was up, gold decreased as expected, natural gas is increasing, and oil, though presently stable, will increase rapidly starting in 1966. The cumulative production for Alaska has reached $1,647,500,000 (at present prices).

Revenue obtained by the State from the minerals industry for the year amounted to approximately $27,000,000 nearly double the figure for 1964. This includes production taxes, royalties, bonuses, and sale of sand and gravel but does not include income and license taxes in connection with the minerals industry.

Table I - Mineral Production in Alaska

	1964		1965 (1)	
	Quantity	Value (Thousands)	Quantity	Value (Thousands)
Antimony----short tons antimony content	14	$ 18	------	$------
Coal----------thousand short tons	745	5,008	860	5,878
Copper - short tons recoverable content	11	7	------	------
Gold----------thousand troy ounces	58	2,045	43	1,505
Mercury----------76-pound flasks	303	95	180	104
Natural Gas----------million cubic feet	5,982 (2)	1,610	6,184 (2)	1,487
Peat----------short tons	2,350	19	------	------
Petroleum,crude--------thousand barrels	11,030	33,880	11,128	34,073
Sand and Gravel-----thousand short tons	26,089	18,488	29,959	33,925
Silver----------thousand troy ounces	7	9	5	6
Undistributed (3)		4,912		5,296
		$66,091		$82,274

(1) All figures for 1965 are preliminary and subject to revision.

(2) Includes only gas sold. An additional 5,479 (1964) and 5,189 (1965) million cf was used on leases for pressure maintenance and power, or was unavoidably lost. Please refer to Petroleum Statistics for details.

(3) Undistributed includes gem stones, platinum group metals, uranium ore and clay.

Note: Above statistics prepared under a cooperative agreement for the collection of mineral data between the Bureau of Mines, United States Department of the Interior, and the Division of Mines and Minerals, Department of Natural Resources, State of Alaska. Figures for coal, petroleum, natural gas, and undistributed commodities are presented on authority of the Division of Mines and Minerals only.

Figure 1 - Annual Value of All Mineral Production - Alaska 1900 - 1965

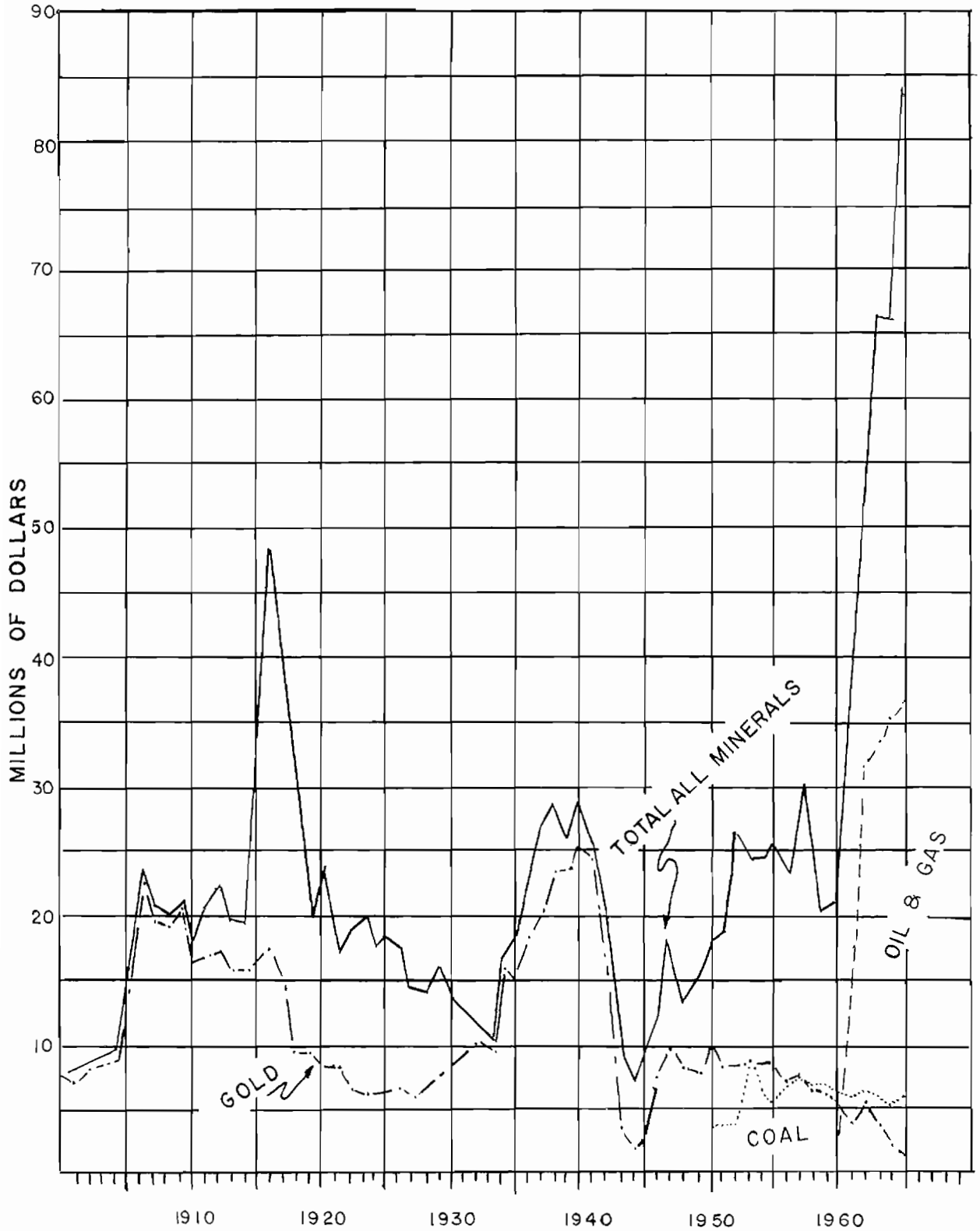


Table II - Production of Major Commodities
Dollar Value (Thousands)

Year	Gold	Mercury	Coal	Oil and Gas	Total All Production (Millions)
1950	$ 10,125	$	$ 3,033	$	$ 17.9
1951	8,387		3,767		19.5
1952	8,420	6	5,779		26.3
1953	8,882	8	8,452		24.3
1954	8,699	277	6,442		24.4
1955	8,725	12	5,759		25.4
1956	7,325	853	6,374		23.4
1957	7,541	1,349	7,296		30.2
1958	6,525	774	6,931		20.9
1959	6,262	851	6,869	311	20.5
1960	5,887	940	6,318	1,496	21.9
1961	3,998	816	5,868	17,776	34.7
1962	5,784	711	6,409	31,657	54.2
1963	3,485	76	5,910	33,760	67.8
1964	2,045	95	5,008	35,490	66.1
1965	1,505	104	5,878	36,775	83.5
	$103,595	$6,872	$96,093	$157,265	$561.0

Table III - Physical Volume of Alaska Mineral Production (1)

Mineral	Quantity	Years
Total gold----------troy ounces	29,866,000	1880-1965
placer----------do----	20,959,000	1882-1965
lode----------do----	8,906,000	
Total silver----------do----	19,049,000	1906-1965
placer----------do----	2,545,000	1906-1965
lode----------do----	16,504,000	1900-1965
Copper----------short tons	690,011	1880-1965
Coal----------do----	17,956,000	1951-1965
Sand and gravel----------do----	153,905,000	1958-1965
Crude Petroleum-----42 gal bbls	50,259,000	1958-1965
Natural gas---------million ft^3	24,464	1948-1965
Stone----------short tons	8,713,000	1921-1965
Mercury----------76-lb flasks	34,602	1902-1965
Tin----------short tons	2,400	
Chromite (approx. 45% Cr_2O_3) long tons	29,000	1917-1965
Tungsten----short ton units WO_3	7,000	1916-1965
Antimony (approx. 53% Sb) short tons	3,414	1928-1965
Lead----------do----	25,000	1906-1965

(1) Except platinum, uranium, and other commodity figures which are confidential. 1965 production estimated and included in total.

(2) Only other crude petroleum recorded production was from the Katalla area. From 1901 to 1932, 154,000 barrels of oil were produced there.

Precious Metals

Gold production in ounces fell to the lowest level since 1882. There are now only two bucketline gold dredges working full time during the mining season and six part time dredges operating. Several hydraulic units and bulldozer-dragline outfits worked a full season. A few thousand ounces of gold was produced by lode gold mines.

The Goodnews Bay Mining Company actively continued dredging platinum bearing gravel and was again the nation's only primary producer of this metal.

There were 409 gold claims staked and 4723 affidavits of annual assessment work recorded for gold claims compared to 709 gold claims staked and 4598 affidavits for gold claims recorded during 1964.

Base Metals

Antimony concentrates were shipped from developing prospects in the Fairbanks area and copper concentrates were shipped from the McCarthy area.

Cinnabar was concentrated and shipped by Robert Lyman from the White Mountain deposit near McGrath, and a few flasks of mercury were shipped by individuals near Red Devil.

Nonmetallics

Sand and gravel production increased from 26,089 tons to an estimated 29,959 tons during 1965. The value per ton increased from 71¢ to $1.13 during the year indicating that more crushed and broken rock was used thus reflecting an increase in highway construction.

Coal

Coal production increased during the year from 745,000 tons to 860,000 tons, and the average price is estimated to have increased from $6.72 to $6.83 per ton.

Evan Jones Coal Company is the largest producer in the Matanuska Coal Field. The production from the Nenana Coal Field was nearly evenly distributed between the Usibelli Coal Mine and the Vitro Minerals Mine. It is anticipated that the mine-mouth power plant now being constructed near Healy will stabilize production from the Nenana field. Production from the Matanuska field during 1966 will depend largely on the decision of the Congressional Committee investigating the overall effect of the proposal to convert the military bases near Anchorage from coal to natural gas.

Prospecting and Exploration

Northwestern

It is estimated that approximately $1,180,000 was spent in prospecting, exploration, and development in this area during the year, mostly by Kennecott Copper Corporation.

Kennecott was nearly 200 feet down with its projected 1100' shaft at the new community of Bornite near Kobuk. During the year it completed construction on year-around camp and shaft facilities and was working three shifts on shaft-sinking. Plans call for lateral exploration by tunnels and diamond drilling when the shaft is completed. The company expects it will take five years to reach production.

The tin deposits at Lost River on the Seward Peninsula were drilled as part of an exploration program of U.S. Steel Corporation. U.S. Steel's Lost River project started in 1964 and included considerable geophysical work. The company also prospected for lode tin deposits in the Manley Hot Springs area and elsewhere, using several geophysical methods. The belt of tin-bearing gold placers at Manley Hot Springs is about eight miles long and a mile wide, but no bedrock source for the tin has ever been discovered.

A large group of offshore prospecting permits off the Seward Peninsula and in Goodnews Bay were consolidated under the management of Ocean Mining A.G., a subsidiary of Ocean Science Engineering, Inc. This company has been investigating the recovery of gold, platinum, and tin from the offshore deposits. The Thompson Group of Denver also has been consolidating offshore holdings for mining purposes.

American Metals-Climax conducted helicopter-supported reconnaissance exploration for molybdenum in northwestern Alaska.

On the Seward Peninsula, the area around the old Independence lead-silver prospect, at the confluence of Holtz Creek with the Kugruk River (Bendeleben C-1 Quadrangle), was investigated by Bullock and Berg. They reportedly had a helicopter and a bulldozer.

Central

Exploration expenditures in Central Alaska are estimated to have been $180,000 during 1965.

A syndicate managed by Dome Mines (formerly managed by Moneta-Procupine) continued drilling and trenching on the copper deposit in the Pass Creek drainage in the Healy A-1 quadrangle near Denali.

In the Nabesna area, no additional drilling was done by Bear Creek Mining Company on the Orange Hill copper-molybdenum deposit, but annual assessment work was done on nearby Bear Creek claims. Reconnaissance exploration was carried on by the company in the eastern and central Alaska Range, in the Wrangell Mountains, and on the west side of Cook Inlet. In the latter area, a copper prospect staked by local interests near the Drift River was examined.

Silver Ridge Mining Company continued shaft sinking and trenching on antimony claims near Fairbanks and investigation of other claims in the Kantishna mining district.

Keystone Mines, Inc., continued development work and mining of its gold deposit at Cleary Summit near Fairbanks.

Southcentral

Exploration expenditures in this area are estimated at $95,000.

Rick Richards, Joe Kelly and others were cutting trenches across the lead-silver vein discovered by a Division of Mines and Minerals geologist in 1963 on Ahtell Creek near Slana.

The Spirit Mountain nickel prospect, about 15 miles southeast of Chitina, was drilled by Prosper Oil Company. Two drills and a 12-man crew, supported by a helicopter, were active on the project.

The Wrangell Consolidated Mining Company was surface-mining copper ores, up-grading, and shipping by air at the original Kennecott property at McCarthy. They are in the process of installing better milling and concentrating facilities and hope to haul concentrates by truck to Valdez next year.

Southwestern

Exploration expenditures were higher in this area than elsewhere and are estimated to have been $1,482,000. This was chiefly because of Pan American Petroleum Corporation activities.

Pan American staked approximately 220 claims during 1965 on lead, zinc, silver, and gold prospects and carried on an intensive exploration program on the Alaska Peninsula utilizing a large crew and several helicopters. The work included considerable diamond drilling in the Chignik area. Pan American also continued work on seven iron prospects staked in 1964. These claim groups are as follows: Near Chenik Mountain (59°42'N, 153°14'N, 154°14'W); Iliamna Bay (59°42'N, 153°34'W); the Dutton area (59°42'N, 153° 50'W; near the old Dutton prospect where chalcopyrite, magnetite and minor molybdenite, silver and lead occur in skarn along a contact between limestone and greenstone); at Pile Bay (59°45'N, 153°50'W, where geologists

of the U.S. Geological Survey report hornblendite similar to that mentioned below at Frying Pan Lake); southwest of Ursus Cove (50°30'N, 153°48'W); near Meadow Lake (59°40'N, 154°02'W, just west of the Dutton prospect); and north of the Paint River (59°14'N, 154°28'W). A total of 497 claims were staked in 1964, 113 of them in the Iliamna Bay area, which is reported as the largest iron deposit of the group. According to Pan American, the deposits contain roughly a billion tons of ore grading 11 to 18 percent iron as titaniferous magnetite. Specimens seen by Division personnel are magnetite-bearing diorite, but apparently some veins or replacements are present. The deposits are close to large natural gas reserves held by Pan Am on Cook Inlet, and this gas might allow cheap power for beneficiation of the ore. The location near the ice-free portion of Cook Inlet is another attractive feature noted by Pan Am. However, they point out that development will probably be 10-15 years in the future because of the low grade and titaniferous character of the ore.

Davis Mining Company was active in prospecting near Chignik, and also did further work on iron claims near Chenik Mountain and Iliamna Bay.

In October the U.S. Geological Survey announced the discovery of magnetite-bearing rocks near Frying Pan Lake in the Iliamna D-7 quadrangle. According to an open-file report by Reed and Detterman of the Survey, the magnetite-bearing rocks consist of angular fragments of pyroxenite in a plutonic breccia within a much larger granodiorite body. Pyroxenite samples contained between 16 and 24% FeO. Magnetite concentrates contained 56-80% FeO, about 3.1% TiO_2, and generally less than 0.4% P_2O_5. The plutonic breccia containing the pyroxenite is exposed in an area over a mile long and up to one-half mile wide. Shortly after the announcement, claims were staked in the area by Atlantic Refining Company.

A prospector from Naknek worked near Battle Lake in the Iliamna quadrangle and continued to explore a quartz vein carrying gold and copper values located a few miles north of the east end of the lake.

Exploration work was carried on from May through October at the Kasna Creek copper-iron prospect in the Lake Clark A-3 quadrangle by St. Eugene Mining Company (largely owned by Falconbridge). The work included diamond drilling of several relatively deep holes and was supported by helicopter. Mineralization at the deposit consists of chalcopyrite and iron oxides in silicified limestone and skarn.

A local group drilled a gold prospect within the city limits of Seward.

Southeastern

Bunker Hill Mining Company carried out a large scale investigation of zinc and lead-silver prospects near Wrangell. The work included a geologic mapping and drilling program in the vicinity of the old Virginia Lake and Groundhog Basin prospects described in U.S. Geological Survey Bulletin 998-B and investigation of the nearby deposits found in 1963 by Bill Huff while participating in the State of Alaska Prospector Assistance Program.

Dome Mining Company carried on a geochemical and geophysical investigation south of Juneau.

Two Canadian syndicates operated with boats outfitted for prospecting in southeastern waters during the year. They both covered large areas.

Several individuals prospected in the vicinity of Hollis. Angus Lillie prospected by geochemical methods in the area surrounding his molybdenum and copper-magnetite showings near Shakan on Kosciusko Island.

General

Late in the year an exploration office was established in Anchorage by Richard Denny for The Eagle-Picher Company, an old-line lead and zinc mining and smelting firm. Mr. Denny is a former assayer at the Division's Ketchikan office. Another large base metal mining company was reported to be considering opening an Anchorage exploration office.

A mining engineer and geologist from Mitsubishi interests visited the Jumbo Basin area and the Alaska Peninsula, and discussed mineral possibilities of Alaska with Division personnel. Mitsubishi is interested in participating in the development of moderate to large size base and ferrous metal mines, especially copper. Other Japanese companies have expressed similar interest during the year.

Representatives of several other large base metal companies and one asbestos company visited the State during the year to examine properties and discuss mineral possibilities.

Total private capitol exploration expenditures, estimated at $3,187,000, are twice those spent last year.

The U.S. Geological Survey spent approximately $3,000,000 in the State during 1965. It continued topographic mapping, geologic mapping, water resource studies, and administered regulations covering the conservation of oil, gas, and coal on federal land. New geological publications of interest pertaining to Alaska released during the year were as follows:

Bulletin 1178, Stratigraphy and Petrography of the Pybus-Gambier Area, Admiralty Island, Alaska, by Robert A. Loney.

Bulletin 1201-B Quaternary Geology of the Mount Chamberlin Area, Brooks Range, Alaska, by E.M. MacKevett, Jr.

Bulletin 1181-R, Reconnaissance Geology of Admiralty Island, Alaska, by Lathram and others.

Bulletin 1187, Quicksilver Deposits of Southwestern Alaska, by C.L. Sainsbury, and E.M. MacKevett, Jr.

Map I-415, Map Showing Extent of Glaciations in Alaska, compiled by the Alaska Glacial Map Committee.

Open File Report, Geologic Map and Cross Sections of the Nelchina Area, South Central Alaska, by Arthur Grantz.

Open File Report, Preliminary Geologic Map of the Arctic Quadrangle, Alaska, by W.P. Brosge and H.N. Reiser.

Open File Report, Tertiary Stratigraphy and Paleobotany of the Cook Inlet Region, Alaska, by Jack A. Wolfe.

Open File Report, Geology of the Romanzof Mountains, Brooks Range, Northeastern Alaska, by Edward G. Sable.

Open File Report, Geology and Ore Deposits of the Central York Mountains, Western Seward Peninsula, Alaska, by C.L. Sainsbury.

Open File Report, A Preliminary Report on Some Magnetite-Bearing Rocks near Frying Pan Lake, Iliamna D7 Quadrangle, Alaska by Bruce L. Reed and Robert L. Detterman.

Open File Report, Tectonic Deformation, Subaqeous Slides, and Destructive Waves Associated with the Alaska March 1964 Earthquake.

Open File Report, Preliminary Geologic Map of Northern Alaska, by Ernest H. Lathram.

Open File Report, Preliminary Geologic Map of the Eagle D-1 Quadrangle, East-Central Alaska, by Earl E. Brabb and Michael Churkin, Jr.

Open File report, Planetable Maps and Drill Logs of the Camp Creek and Bessie-Maple Beryllium-Fluorspar Deposits, Lost River Area, Alaska, by C.L. Sainsbury.

Open File Report, Geologic Map and Structure Sections of the Ogotoruk Creek Area and Vicinity, Alaska, by Russell H. Campbell.

Open File Report, Geochemical Reconnaissance of Stream Sediments in the Iliamna Quadrangle, Alaska, by R.L. Detterman and B.L. Reed.

The U.S. Bureau of Mines spent approximately $470,000 in mineral resource investigations throughout the State. It continued field investigation and laboratory testing of the coals of northwestern Alaska some of which may prove to be of coking quality. Other field investigations included the Kuskokwim mercury province, nonmetallic industrial materials near Rampart, Seward Peninsula tin occurrences, and mineral resources in the vicinity of the proposed Nome-Fairbanks Highway. Economic studies and laboratory analyses in connection with these and other areas and mineral resources were made. The Bureau staff also compiled statistics for the annual Minerals Yearbook.

Publications pertaining to Alaska released by the U.S. Bureau of Mines during the year were as follows:

Open File Report, Beryllium Investigation at the Lost River Mine, Seward Peninsula, Alaska, by Robert V. Berryhill.

Open File Report, Diamond-Drill Sampling Data, Fluorite Beryllium Deposits, Lost River Valley, Seward Peninsula, Alaska, by John J. Mulligan.

Open File Report, Examination of the Sinuk Iron Deposits, Seward Peninsula, Alaska, by John J. Mulligan.

Open File Report, Examination of Hannum Lead Prospect, Fairhaven District, Seward Peninsula, Alaska, by John J. Mulligan.

Open File Report, Reconnaissance of the Avnet Manganese Prospect, Tanana Quadrangle, Central Alaska, by Bruce I. Thomas.

Open File Report, Preliminary Investigation of Limestone, Quartzite, and Dolomite Resources Near the Proposed Rampart Dam in Central Alaska by Bruce I. Thomas.

RI 6587, Tin-Lode Investigations, Potato Mountain Area, Seward Peninsula, Alaska, by John J. Mulligan.

Prospecting Costs

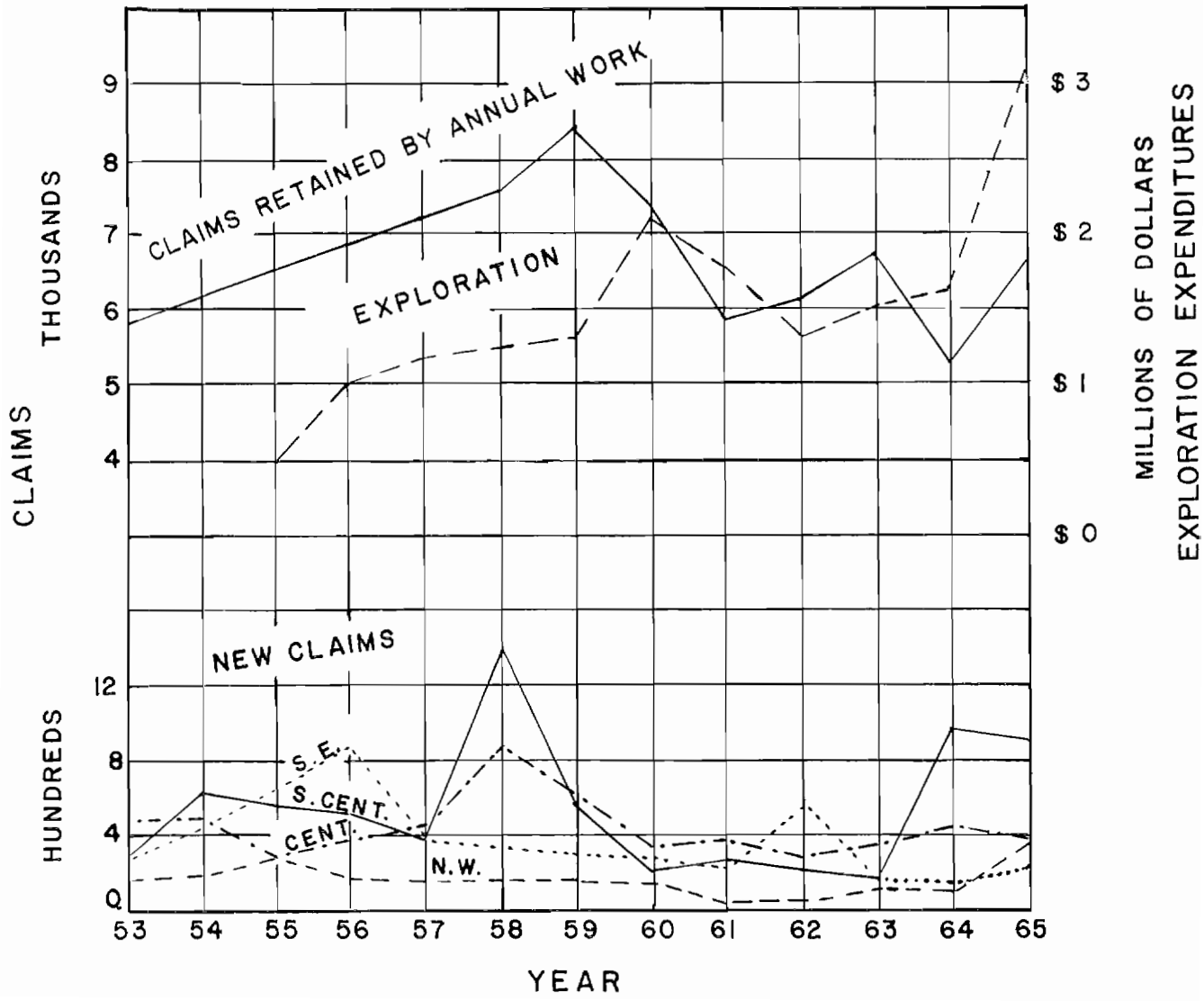
Calculation of the expensesof the first three years of the State Prospector Assistance Program indicates that it costs about $20.64 per day to field a prospector in the State. The total cost of 2,000 man days in the field was $41,273.49. The indicated cost of $20.64 per man day is higher than the actual cost because several of the participants had unreported partners with them, so that more man days were spent in the field than shown above. The cost includes transportation, food and supplies, but not wages. The State reimburses approved applicants for a portion of the expenses. Distributed costs were as follows:

Transportation	$10.29	per man day
Food	3.77	" " "
Supplies	6.58	" " "
Total	$20.64	

Transportation includes aircraft charter, helicopter charter, tracked vehicles, and rubber-tired equipment. Food costs include ordinary groceries and the dry pack camping variety. Supplies include tents, tools, equipment rental, and general supplies.

Small fixed-wing aircraft are available in nearly every town in Alaska. Charter rates for a Piper Cruiser are $20-40 an hour; a Cessna 180 is $40-60 an hour. Helicopters are available in Ketchikan, Juneau, Anchorage and Fairbanks. The rate is usually $100-135 an hour with a guarantee of three hours flying a day.

Figure 2 - Barometer of Exploration Activity



THE PETROLEUM INDUSTRY

1965 Highlights

Oil and Gas Exploration
(See Table IV for specific details and list in back of this volume for active companies)

This has been an exciting year in the search for Alaska's petroleum and natural gas resources. Of the 12 offshore exploration wells active in Cook Inlet during the year, a sufficient number were completed as producers to establish three additional fields as follows: Mobil Oil Company's Granite Point Oil Field and Union-Marathon's Trading Bay and McArthur River Oil Fields.

Three discoveries were made on the upland areas of the Cook Inlet Basin. The Birch Hill Gas Field dicovery well was completed about five miles north of the Swanson River Oil Field and the North Fork Gas Field was discovered about 12 miles northwest of Homer. Both wells were operated by Standard Oil Company of California. On the Moquawkie Indian Reservation a gas discovery well was completed by Mobil Oil Company and Atlantic Refining Company.

During the 1965 drilling season the newly discovered Granite Point Field was extended over three miles by successful field extension drilling.

Also in Cook Inlet waters the previously discovered Middle Ground Shoal Oil Field was extended more than five miles southward from the limits known this time last year and gas production on the Cook Inlet Field was extended to the southwest about two miles. A southeast extension effort was unsuccessful on this structure.

Pan American failed to extend the West Foreland Gas Field with its West Foreland Unit #1. Shell Oil Company was unsuccessful in its two attempts to find production at South Cook Inlet #1 and #2.

Atlantic Refining Company abandoned a 3,000' test near Lake Louise.

Thirty-nine permits to drill oil and gas wells were processed by the Division's Petroleum Branch in 1965. This is more than 2-1/2 times the number processed in 1964.

At the end of the year, five exploratory wells were drilling and one preparing to spud in. One of these is on the North Arctic Slope, that of Sinclair Oil & Gas Company near the mouth of the Colville River on a block of State of Alaska competitive leases.

Texaco Inc., drilling from the beach near the mouth of Nicolai Creek, had considerable trouble shutting off a blow of gas from shallow depths but is under way again. This well will bottom on State owned lands under Cook Inlet waters.

Pan American is drilling a well 13 miles east of Ninilchik. Atlantic is drilling across Knik Arm only six miles northwest of Anchorage, and Wallace Mining Company is active south of Wasilla. Standard Oil will be spudding their Naptowne Unit #24-8 about 7-1/2 miles southeast of the Swanson River Field. This well permit was granted in September of 1963 but drilling was deferred pending solution of legal problems.

Ownership by the State of Alaska to offshore coastal areas in bays within 24-mile headland lines was determined November 18, 1965, by the appeal decision of the Yakutat Bay Case. Initially the U.S. District Court had ruled that the State did not have title to these disputed water bottoms. This decision was appealed by the State to the U.S. Court of Appeals in San Francisco. This Court reversed the decision of the District Court after the California Tidelands Decision of May 17, 1965, by the U.S. Supreme Court, which ruled that California has sovereignty over coastal waters within 24-mile headland lines.

The immediate important effect of this decision is that State ownership is extended to below Kalgin Island in lower Cook Inlet, making a greater portion of this potentially valuable oil and gas area available for future oil and gas leasing by the State of Alaska rather than by the Federal government. Twenty-two oil companies joined in a reconnaissance seismic survey of this general area during the fall of1965.

Geophysical exploration was noted in the Bristol Bay area, the Gulf of Alaska, and on the North Arctic Slope in addition to the above-mentioned Cook Inlet activity.

Development Drilling & Production Activity

The Shell Oil Company group started drilling development wells from their offshore platform on April 14 and finished three at year's end. A fourth well is nearing completion. The Pan American group spudded the first well from their platform on December 17.

The impact of Alaska's offshore discoveries and extensions is not yet widely appreciated. This is caused partly by the lack of pipelines to transport the offshore oil toward market outlets. The State's stature as an oil producer has been ranked solely by the 30,000 barrels per day produced from the Swanson River Field on the Kenai Peninsula (See Table VI). Under these circumstances it was a very significant milestone when the twin 8-inch crude oil pipeline was completed on December 14, 1965, connecting Shell Oil Company's Platform A and Pan American Petroleum Corporation's Platform B on Middle Ground Shoal with an onshore treating facility. From the treating facility, the oil enters the Alaska Pipeline which terminates at the Standard Oil Company of California's Alaskan Refinery and ocean

wharf at Nikiski. The completion of the offshore pipeline resulted in an immediate increase in production as the three shut-in wells from the Middle Ground Shoal Field began flowing. Additional development wells are being completed on a year-around basis from both the existing drilling-producing platforms in this field.

Contracts for five additional offshore drilling and producing platforms have been let which will result in development drilling in the Granite Point, Trading Bay, and South Middle Ground Shoal areas in 1966.

Of the nine gas fields in the State, four have access to markets. Gas production rose sharply in December 1965 as the Kenai Gas Field, which has been supplying only the Anchorage market, started supplying gas for the Swanson River Oil Field repressuring program. Up to 120 MMCF of gas per day will be used in this program at full capacity (See Table IX). This amounts to nearly ten times the volume of gas required by the present Anchorage domestic gas market. Six new dually-completed development gas wells were drilled in the Kenai Gas Field to meet this new demand. These wells were drilled on a 320-acre spacing pattern pursuant to a temporary order of the Alaska Oil and Gas Conservation Committee.

Gas Injection

At Swanson River Field insufficient pressure maintenance has caused a drop in reservoir pressure to 4040 pounds per square inch from 5650, although with gas lift on more than half the wells, the production has been sustained. Now with extensive repressuring starting in December 1965, the reservoir pressure will be increased and there should be little difficulty in maintaining present rate of production.

Water production in this field has increased from 10.2% in December of 1964 to 18.3% at the end of 1965. With an increase of reservoir pressure through massive gas injection the water percentage should not increase further.

A total of 4,722 MMCF was injected in the Swanson River Field in 1965 through three wells. The production of the dry-gas wells in this field has declined to 4,400 MCF/day.

Production Summary

Kenai Field - sales totaled 5,289 MMCF to Anchorage Natural Gas Corporation and 653 MMCF to Swanson River. Total produced was 5,985 MMCF compared to 4,493 MMCF in 1964, an increase of 33.2%.

Swanson River Field - All dry and wet gas produced that was not sold or used on the units was injected or used for gas lift. Production from the dry gas wells amounted to 2,088 MMCF compared to 3,844 MMCF in 1964. Sales were 122,482 MCF compared to 122,893 MCF in 1964, a decrease of 0.2%.

Sterling Field - With only one of two wells producing, Sterling Field sold 118,141 MCF compared to 57,680 MCF in 1964, an increase of 104.8%

South Barrow Field - This field produced a total of 325,632 MCF through November. Of this amount 62,337 MCF was sold to Barrow Utilities, Inc.

Other Gas Fields - The West Fork, Falls Creek, West Foreland, Cook Inlet, East Umiat, Birch Hill, Moquawkie, and Beluga River Fields were shut-in because of lack of market, and the North Fork gas discovery well is still testing.

Pipelines - An estimated $9,550,000 was spent in 1965 in the construction of new pipelines. Twin eight-inch submarine oil gathering lines from the Pan American platform to the Shell platform on Middle Ground Shoal and thence to the East shore of Cook Inlet at a point near Nikiski totaled about 101,000 feet. The pipe was covered with a concrete blanket and vibration reducing exterior spirals. Another 21,000 feet of 12-inch onshore oil gathering line was continued to the refinery and ocean shipping terminal at Nikiski. This was completed in December and was dedicated and placed in operation on the 14th of that month, shipping production from the first three of the S-R-S Middle Ground Shoal wells.

About 17 miles of 20-inch gas line was laid by Union-Marathon from the Kenai Gas Field to a point near the Nikiski Terminal. Standard-Richfield built about 18.7 miles of 16-inch line from the Swanson River Field to this point near the Nikiski Terminal and there tied into the Union-Marathon line. This line will be used to transport the required 100 to 125 million cubic feet per day of gas from Kenai Field to the Swanson River Field for repressuring. The Union-Marathon line may at some future date carry the gas required by a liquefaction plant proposed to be built near the ocean shipping terminal at Nikiski.

Table IV

WELLS ACTIVE IN 1965

State Permit	Company	Well Name	Well No.	Location 1/4 Sec.	T	R	B&M	Date Spud	Date Comp.	Footage Drilled T.D.	Footage Drilled 1965	Status 12-31-65	Initial Production Bbls or MCF	Remarks
EXPLORATORY WELLS (includes stepout wells 1 mile or more from production)														
11-62	Shell Oil	SRS State	1	SE 24	10N	11W	S	5 -20-62	8 -11-65	16,375	2,334	Susp.		Susp.9-9-62 @ 14,041' Re-entered 5-5-65.
64-11	Humble Oil	Tyonek Reserve	1	NE 5	11N	11W	S	9 -3 -64	1 -4 -65	13,600	0	P&A		
64-12	Pan Am	West Foreland U.	1	SE 3	8N	14W	S	11-12-64	5 -27-65	11,017	6,317	P&A		
64-15	BP Expl.	Itkillik U.	1	SE 11	1N	6E	UP	1 -9 -65	3 -22-65	7,751	7,751	P&A		
65-1	SOCAL	Birch Hill U.	22-25	NE 25	9N	9W	S	1 -30-65	6 -9 -65	15,500	15,500	GST	14,500 MCF	1" bean, T.P.600 psi.
65-2	Mobil Oil	Granite Point	1	NW 13	10N	12W	S	4 -5 -65	8 -5 -65	11,565	11,565	OW-SI	1,230 B/D	42°API, 32/64" bean- T.P. 2,328 psi.
65-3	Wallace Mng.	Wallace-Knutson	1	SW 23	17N	1W	S	4 -11-65	6 -28-65	550	550	P. Water Well		
65-4	Shell Oil	M.G.S.	A-1-3	SE 11	8N	13W	S	4 -4 -65	6 -20-65	9,840	9,840	POW	1,130 B/D	37°API, 32/64" bean- T.P. 160 psi.
65-5	Union Oil	Trading Bay	1	NE 4	9N	13W	S	4 -30-65	5 -9 -65	747	747	P&A		Surf.csg.parted @ 126'
65-12	Mobil Oil	Moquawkie	1	NE 1	11N	12W	S	5 -2 -65	11-28-65	11,364	11,384	GSI		Blew out & caught fire at shallow depth
65-13	Union Oil	Trading Bay	1-A	NE 4	9N	13W	S	5 -10-65	6 -25-65	6,532	6,532	OW-SI	1,640 B/D	28.9°API,34/64" bean- T.P. 375 psi.
65-14	Pan Am	Tyonek St.18742	1	SW 6	10N	11W	S	6 -2 -65	7 -21-65	9,503	9,503	OW-SI	2,455 B/D	41°API, 40/64" bean- T.P. 650 psi.
65-16	Wallace Mng.	Wallace-Knutson	1-A	SW 23	17N	1W	S	6 -17-65		3,502	3,502	Changing from cable tool to rotary.		
65-19	Pan Am	Tyonek St.	2	SE 30	11N	11W	S	7 -27-65	10-15-65	12,335	12,335	Susp.		
65-20	Union Oil	Trading Bay	3	NW 9	9N	13W	S	7 -25-65	9 -1 -65	7,260	7,260	Susp.		
65-21	SOCAL	North Fork U.	41-35	NE 35	4S	14W	S	8 -9 -65		12,812	13,506	Gas Well		Still testing.
65-22	Pan Am	MGS St. 18746	1	SW 35	9N	13W	S	8 -20-65	10-17-65	10,298	10,298	OW-SI	2,148 B/D	35.4°API,40/64" bean- T.P.590, GOR 235 cf/bbl.
65-23	Shell Oil	So.Cook Inlet St.	2	SW 2	9N	11W	S	8 -20-65	11-22-65	15,403	15,403	Susp.		
65-24	Union Oil	Grayling	1	SE 29	9N	13W	S	9 -2 -65	9 -7 -65	817	817	P&A		Mechanical problems.
65-25	Union Oil	Grayling	1-A	SE 29	9N	13W	S	9 -14-65	11-7 -65	10,227	10,227	OW-SI	1,265 B/D	36.0°API,20/64" bean- T.P.590, GOR 292 cf/bbl.
65-27	Texaco	Nicolai Cr. St.	1	NE 31	11N	12W	S	10-31-65		3,815	3,815	drlg.		Blowout at shallow depth.
65-28	Pan Am	C.I.St. 18741	1	SE 8	11N	9W	S	11-11-65	11-22-65	6,030	6,030	P&A		
65-29	Texaco	Trading Bay St.	1	SW 34	10N	13W	S					Loc.		
65-30	Pan Am	C.I. St. 18740	1	NE 11	11N	10W	S	10-25-65	11-8 -65	6,182	6,182	GSI	8,700 MCF	5/8"bean,T.P750 psi.
65-31	Sinclair	Colville	1	SW 25	12N	7E	UP	11-12-65		3,292	3,292	Drlg.		
65-33	Texaco	Coal Bay St.	1	SE 8	6S	12W	S					Loc.		
65-34	Atlantic	Rainbow Federal	1	SW 31	8N	5W	CR	12-5 -65	12-21-65	3,000	3,000	P&A		

Table IV

(continued)

State Permit	Company	Well Name	Well No.	Location 1/4	Sec.	T	R	B&M	Date Spud	Date Comp.	Footage Drilled T.D.	Footage Drilled 1965	Status 12-31-65	Initial Production Bbls or MCF	Remarks
EXPLORATORY WELLS (continued)															
65-36	Pan Am	USA Edna May Walker	1	SE	35	1S	12W	S	11-25-65		9,102	9,102	Drlg.		
65-37	Atlantic	Lorraine St.	1	NE	21	14N	4W	S	12-27-65		343	343	Drlg.		
												187,135	(includes 714' redrilled footage)		
DEVELOPMENT WELLS															
65-6	Union Oil	Kenai Unit	21-6	NW	6	4N	11W	S	5 -6 -65	5 -29-65	5,682	5,682	GSI		
65-7	Union Oil	Kenai Unit	33-32	SW	32	5N	11W	S	5 -1 -65	5 -26-65	5,232	5,232	GSI		
65-8	Union Oil	Kenai Unit	21-7	NW	7	4N	11W	S	5 -27-65	6 -16-65	4,453	4,453	GSI		
65-9	Union Oil	Kenai Unit	43-6	NE	6	4N	11W	S	5 -26-65	6 -14-65	5,706	5,706	GSI		
65-10	Union Oil	Kenai Unit	11-7	NW	7	4N	11W	S	Not to be drilled.						
65-11	Union Oil	Kenai Unit	43-7	SE	7	4N	11W	S	6 -15-65	6 -28-65	5,707	5,707	GSI		
65-17	Union Oil	Kenai Unit	11-6	NW	6	4N	11W	S	6 -17-65	6 -30-65	4,459	4,459	GSI		
65-15	Shell Oil	MGS State	A-2-1	NE	11	8N	13W	S	6 -22-65	9 -17-65	11,052	11,052	POW	900 B/D	38.6°API,1" bean-TP 100 psi, CP 200 psi.
65-18	Union Oil	Trading Bay	2	SE	33	10N	13W	S	6 -25-65	7 -24-65	6,627	6,627	Susp.		
65-26	Shell Oil	MGS State	A-3-4	SW	12	8N	13W	S	9 -19-65	11-26-65	10,960	10,960	POW	550 B/D	
65-32	Pan Am	Tyonek St. 18742	2	SW	31	11N	11W	S	10-20-65	11-28-65	9,310	9,310	OW-SI	2,056 B/D	41.1°API,32/64" bean-T.P. 500 psi.
65-35	Shell Oil	MGS State	A-4-6	NE	14	8N	13W	S	11-28-65		10,048	10,048	Drlg.		
65-38	Pan Am	MGS St. 17595	5	SW	30	9N	12W	S	12-17-65		1,400	1,400	Drlg.		
65-39	Pan Am	MGS St. 17595	6	NW	31	9N	12W	S	12-15-65		600	600	Drlg.		
												81,236			

Table V

Oil Production by Months

Year	Month	Oil Prod. Month-Bbls.	Oil Prod. Year-Bbls.	Cumulative Oil Prod.-Bbls.	Number of Wells
SWANSON RIVER FIELD					
Oil produced prior to 1962					
1962	Jan.	808,752		7,106,844	47
	Feb.	768,203			48
	Mar.	824,760			49
	Apr.	848,253			49
	May	877,642			49
	June	860,969			50
	July	882,674			50
	Aug.	883,754			51
	Sept.	830,246			51
	Oct.	890,016			51
	Nov.	878,220			51
	Dec.	905,621	10,259,110	17,365,954	52
1963	Jan.	943,558			44
	Feb.	812 837			46
	Mar.	894,241			46
	Apr.	862,546			48
	May	892,244			49
	June	866,712			54
	July	907,343			53
	Aug.	896,308			53
	Sept.	888,777			54
	Oct.	945,016			54
	Nov.	903,311			55
	Dec.	927,071	10,739,964	28,105,918	54
1964	Jan.	945,348			54
	Feb.	883,858			54
	Mar.	858,811			53
	Apr.	912,185			53
	May	948,770			55
	June	915,204			55
	July	941,565			55
	Aug.	940,175			55
	Sept.	914,025			55
	Oct.	944,743			54
	Nov.	908,956			54
	Dec.	940,232	11,053,872	39,159,790	54

Table V (Continued)

Year	Month	Oil Prod. Month-Bbls.	Oil Prod. Year-Bbls.	Cumulative Oil Prod.-Bbls.	Number of Wells
1965	Jan.	944,032			55
	Feb.	849,306			55
	Mar.	940,920			53
	Apr.	911,939			53
	May	942,537			53
	June	914,406			51
	July	930,389			51
	Aug.	946,856			48
	Sept.	912,001			51
	Oct.	942,602			52
	Nov.	914,089			52
	Dec.	950,687	11,099,404	50,288,335	50
MIDDLE GROUND SHOAL FIELD					
1965	Nov.	286			1
	Dec.	27,171	27,457	27,457	3
GRANITE POINT FIELD					
1965	No wells on production.				
TRADING BAY FIELD					
1965	July	*1,684	1,684	1,684	1
McARTHUR RIVER FIELD					
1965	No wells on production.				
1965 Total			11,128,545	50,066,025	

* Oil from tests saved and sold.

Figure 3

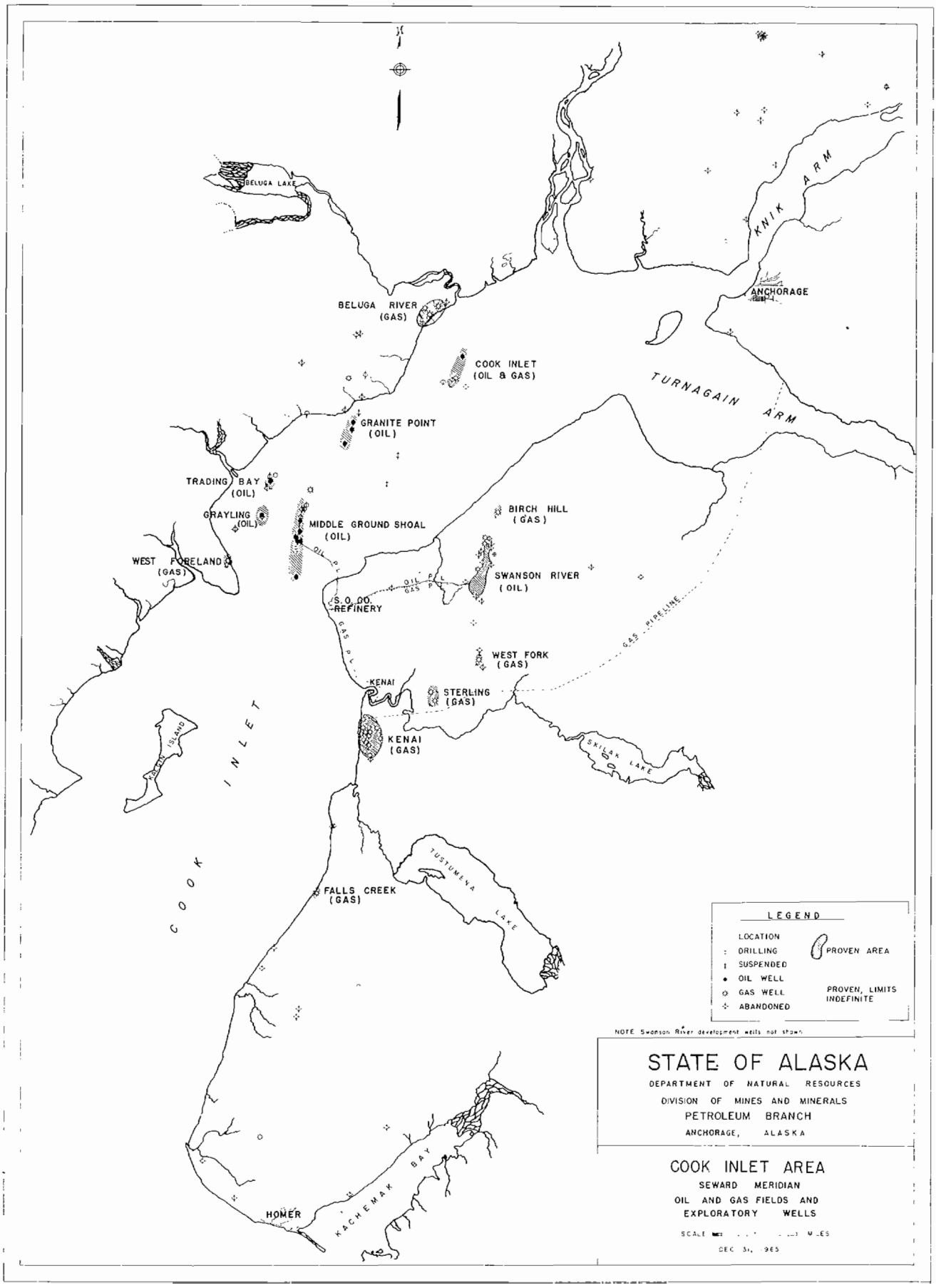

BELUGA LAKE
KNIK ARM
ANCHORAGE
BELUGA RIVER (GAS)
COOK INLET (OIL & GAS)
TURNAGAIN ARM
GRANITE POINT (OIL)
TRADING BAY (OIL)
GRAYLING (OIL)
MIDDLE GROUND SHOAL (OIL)
BIRCH HILL (GAS)
WEST FORELAND (GAS)
SWANSON RIVER (OIL)
OIL PL.
OIL & GAS PL.
S.O. CO. REFINERY
GAS PL.
GAS PIPELINE
WEST FORK (GAS)
KENAI
STERLING (GAS)
KENAI (GAS)
KENAI ISLAND
SKILAK LAKE
COOK INLET
TUSTUMENA LAKE
FALLS CREEK (GAS)
KACHEMAK BAY
HOMER
LEGEND
LOCATION
DRILLING
SUSPENDED
OIL WELL
GAS WELL
ABANDONED
PROVEN AREA
PROVEN, LIMITS INDEFINITE
NOTE Swanson River development wells not shown
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS
PETROLEUM BRANCH
ANCHORAGE, ALASKA
COOK INLET AREA
SEWARD MERIDIAN
OIL AND GAS FIELDS AND EXPLORATORY WELLS
SCALE
DEC 31, 1965

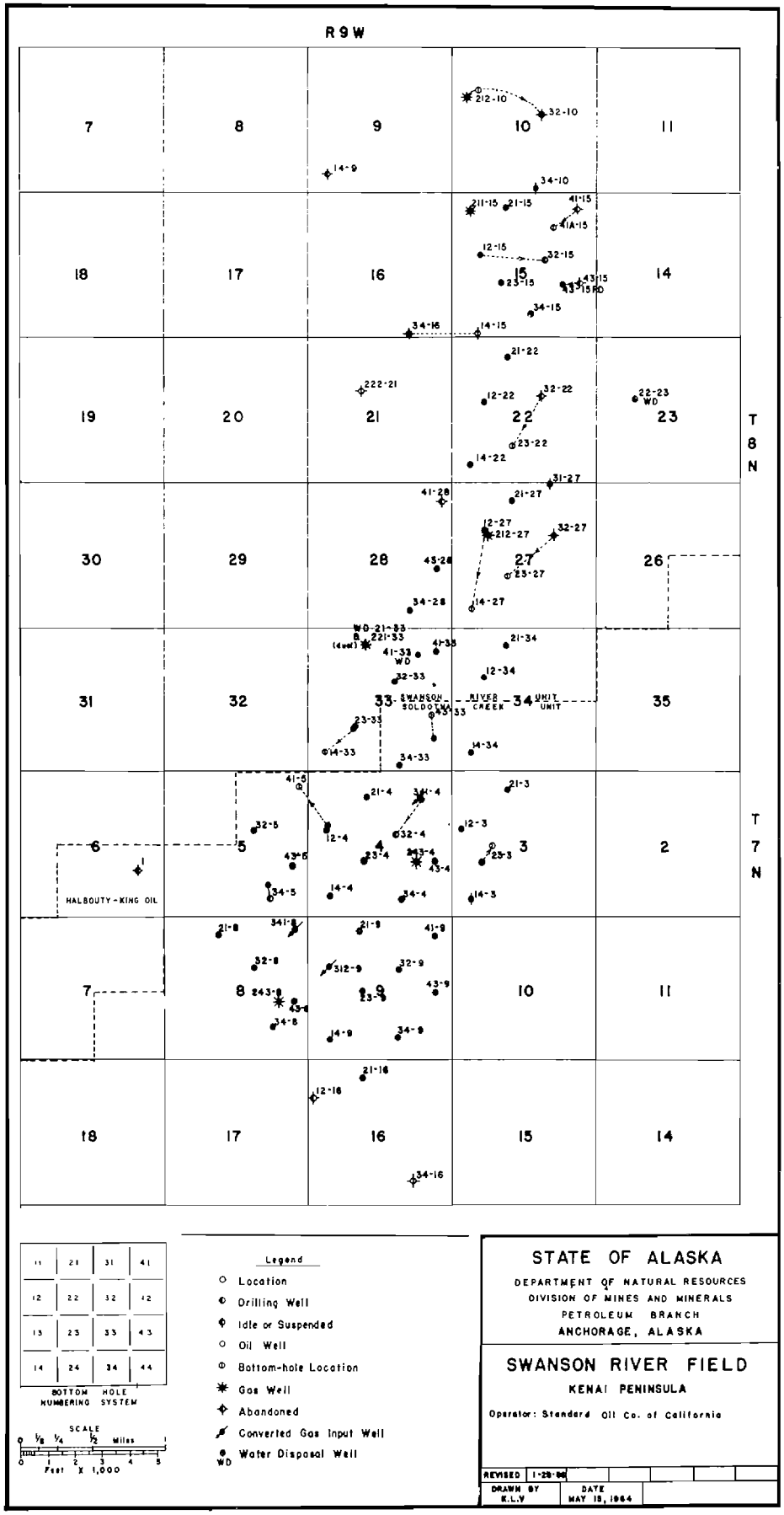
Table VI

Swanson River Field
Kenai Peninsula, Alaska

Standard Oil Company of California, Western Operations, Inc., Operator

Location	T7N & 8N R9W, Seward Meridian
Discovery Well	SRU 34-10
Discovery Date	August 24, 1957
Producing Formation	
Oil	Hemlock Zone - 10,150'-11,700'
Gas	Kenai - 3000'-5,800'
Deepest Test	SCU 22A-32 - 14,796'
Wells	
Oil - Flowing	22
Gas Lift	28
Shut-in	6
Gas - Producing	2
Shut-in	4
Salt water disposal	2 (one is dual - gas producer and disposal)
Gas injection	3
Production Data - 1965	
Oil Production	11,099,404 bbls.
Water Production	1,682,538 bbls
Gas Production - with oil	3,735,811 MCF
Gas Production - gas wells	2,087,795 MCF
Cumulative Production 12/31/65	
Oil	50,259,194 bbls.
Water	3,892,255 bbls.
Gas - with oil	12,882,328 MCF
Gas - gas wells	10,822,179 MCF
Reservoir Data - Hemlock Zone	
Initial Reservoir Pressure	5,650 psi.
Reservoir Pressure 12/31/65	4,040 psi.
Saturation Pressure	1,000-1,400
Oil Gravity	30.0°-37.8° API
Temperature	180°F
Net Pay Thickness	8'-300'
Porosity	18-26%
Permeability	0-3,275 Mds.
Connate Water	40%
Formation Volume Factor	1.12
Gas-Oil Ration	139-753 SCF/STB
Participating Area	6,245 Acres

Figure 4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HALBOUTY-KING OIL
SWANSON RIVER UNIT
SOLDOTNA CREEK UNIT
Legend
Location
Drilling Well
Idle or Suspended
Oil Well
Bottom-hole Location
Gas Well
Abandoned
Converted Gas Input Well
Water Disposal Well
WD
BOTTOM HOLE NUMBERING SYSTEM
SCALE
Miles
Feet X 1,000
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS
PETROLEUM BRANCH
ANCHORAGE, ALASKA
SWANSON RIVER FIELD
KENAI PENINSULA
Operator: Standard Oil Co. of California
REVISED
DRAWN BY K.L.V
DATE MAY 15, 1964

Figure 5

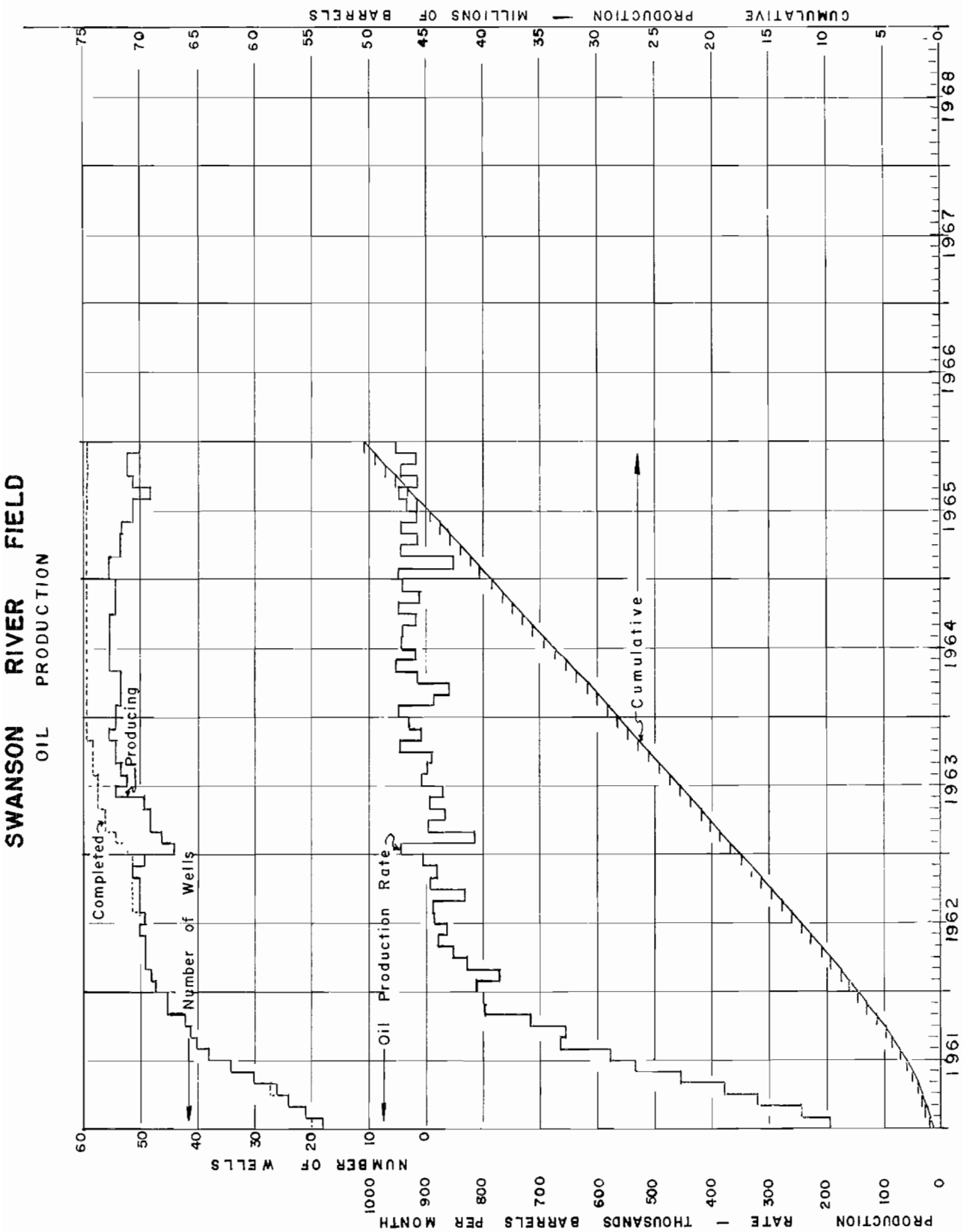

SWANSON RIVER FIELD
OIL PRODUCTION
Completed
Producing
Number of Wells
Oil Production Rate
Cumulative
NUMBER OF WELLS
PRODUCTION RATE — THOUSANDS BARRELS PER MONTH
CUMULATIVE PRODUCTION — MILLIONS OF BARRELS
1961
1962
1963
1964
1965
1966
1967
1968

Table VII A

Swanson River Field
Individual Well Oil Production Statistics

Swanson River Unit

Oil Production

Well No.	Comp. Date	1960	1961	1962	1963	1964	1965	Cumulative
SRU 34-10*	10-1 -57	21,264	59,933	29,227	1,918	1,043	1,062	217,854
12-15	10-5 -60	21,387	34,327	45,426	104,164	90,296	145,544	441,144
14-15*	7 -25-59		7,332	3,636	66			14,269
21-15	6 -7 -61		79,545	167,236	109,481	69,941	32,290	458,493
23-15	4 -5 -61		107,040	146,300	123,448	143,904	199,350	720,042
32-15*	10-24-59	108,308	186,776	162,708	124,600	128,923	76,815	802,494
34-15	8 -4 -61		66,800	123,776	45,810	43,725	17,438	297,549
41A-15	12-9 -62			6,647	136,024	116,995	109,079	368,745
43-15	11-1 -61		2,675	19,181	29,234	22,469	17,283	90,842
12-22	8 -11-62			75,395	224,733	195,084	190,382	685,594
14-22	2 -2 -63				27,900	23,581	25,934	77,415
21-22	1 -3 -62			135,195	65,423	78,025	37,851	316,494
23-22	3 -9 -60	32,581	120,145	86,685	52,411	103,032	49,748	444,602
12-27*	11-30-59	62,540	183,713	164,195	110,420	92,678	134,354	755,183
14-27	6 -14-60	6,582	238,272	312,415	270,366	305,697	261,587	1,394,919
21-27	5 -5 -61		119,571	232,324	194,880	233,780	256,526	1,037,081
23-27	2 -5 -61		98,751	66,458	88,721	76,064	107,093	437,087
31-27*	10-26-58	9,231	40,032	16,666	12,718	2,399	1,902	177,003
34-28	5 -16-63				51,160	87,008	67,478	205,646
43-28	7 -22-61		83,914	173,245	201,821	209,299	195,884	864,163
14-33	6 -11-62			65,473	119,161	185,039	225,494	595,167
23-33	6 -10-61		37,452	44,818	50,644	111,367	104,910	349,191
32-33	8 -25-60	36,655	195,087	294,175	227,676	195,219	212,035	1,160,847
41-33	3 -12-61		182,225	363,453	247,490	319,533	290,963	1,403,664
12-34	10-21-60		142,787	160,764	175,760	200,189	233,854	913,354
21-34	3 -25-63				141,416	178,252	212,493	532,161
Totals SRU		298,548	1,986,377	2,895,398	2,937,445	3,213,542	3,207,349	14,761,003

* produced prior to 1960 - Total 222,344 bbls.

Table VII B

Swanson River Field
Individual Well Oil Production Statistics

Soldotna Creek Unit

Oil Production

Well No.	Comp. Date	1960	1961	1962	1963	1964	1965	Cumulative
SCU 12-3	3 -23-61		201,829	241,286	163,195	257,984	161,443	1,025,737
14-3	8 -2 -61		66,962	127,862	111,475	86,680	3,618	396,597
21-3	1 -10-62			253,580	199,238	123,737	181,022	757,577
23-3	11-12-63				13,452	70,841	27,018	111,311
12-4	4 -8 -61		206,870	315,308	448,589	337,381	375,646	1,683,794
14-4	8 -13-60	83,768	305,632	406,899	474,979	433,066	288,242	1,992,586
21-4	11-5 -61		29,605	215,841	255,905	286,564	328,064	1,115,979
23-4	6 -1 -61		175,004	370,777	472,517	375,279	439,947	1,833,524
32-4	6 -5 -60	74,003	317,492	398,596	425,710	381,621	335,942	1,933,364
34-4	11-26-60		246,747	355,595	437,873	387,460	418,123	1,845,798
41-4	3 -21-60	97,543	301,962	280,253	*			679,758
43-4	5 -14-61		181,890	330,931	327,105	316,238	339,799	1,495,963
32-5	3 -16-62			29,946	67,290	102,183	85,880	285,199
34-5	10-9 -61		30,817	262,993	420,163	343,194	538,278	1,595,445
41-5	9 -20-61		41,594	116,075	102,833	173,845	119,476	553,823
43-5	5 -28-61		91,504	127,021	219,725	233,669	285,977	957,896
21-8	2 -5 -63				164,964	260,072	260,038	685,074
41-8	5 -14-61		119,506	355,493	87,270*			562,269
32-8	2 -22-61		130,883	194,030	204,460	242,599	347,609	1,119,581
34-8	1 -28-62			76,666	105,205	162,007	151,421	495,299
43-8	7 -24-61		161,965	154,901	120,657	153,302	106,952	697,777
12-9	10-9 -60		275,247	236,586	*			511,833
14-9	10-26-60		181,998	195,332	314,525	292,351	368,675	1,352,881
21-9	7 -19-61		137,997	353,681	390,562	411,971	471,527	1,765,738
23-9	7 -17-61		115,333	331,927	341,006	215,240	260,544	1,264,050
32-9	1 -16-61		185,766	282,033	373,733	387,757	457,009	1,686,298
34-9	11-8 -61		26,014	194,171	259,224	285,562	227,058	992,029
41-9	6 -11-61		118,240	260,815	288,681	277,325	100,998	1,046,059
43-9	7 -5 -63				83,926	164,747	4,127	252,800
21-16	7 -8 -63				110,491	281,106	242,731	634,328
34-33	11-12-60	4,137	281,661	243,842	227,676	256,625	320,377	1,334,318
43-33	3 -8 -61		164,602	290,258	260,721	233,723	374,104	1,323,408
14-34	12-23-60		243,004	361,114	329,369	306,201	270,410	1,510,098
Totals SCU		259,451	4,340,124	7,363,712	7,802,519	7,840,330	7,892,055	35,498,191
Totals SRU		298,548	1,986,377	2,895,398	2,937,445	3,213,542	3,207,349	14,761,003
	Prior to 1960							
Field Totals	222,344	557,999	6,326,501	10,259,110	10,739,964	11,053,872	11,099,404	50,259,194

*Converted to gas injection well

Price of Oil

Effective December 15, 1961, for Swanson River Field
Kenai Peninsula, Alaska

Gravity	Price per Barrel*
25-25.9 - degree	$2.41
26-26.9	2.49
27-27.9	2.56
28-28.9	2.62
29-29.9	2.68
30-30.9	2.74
31-31.9	2.80
32-32.9	2.86
33-33.9	2.92
34-34.9	2.98
35-35.9	3.04
36-36.9	3.09
37-37.9	3.14
38-38.9	3.19
39-39.9	3.24
40-40.9	3.29
Average price for 1965 production:	$3.06

Based upon price of (Long Beach) Signal Hill crude less 19¢/bbl. for transportation.

*Price at wellhead.

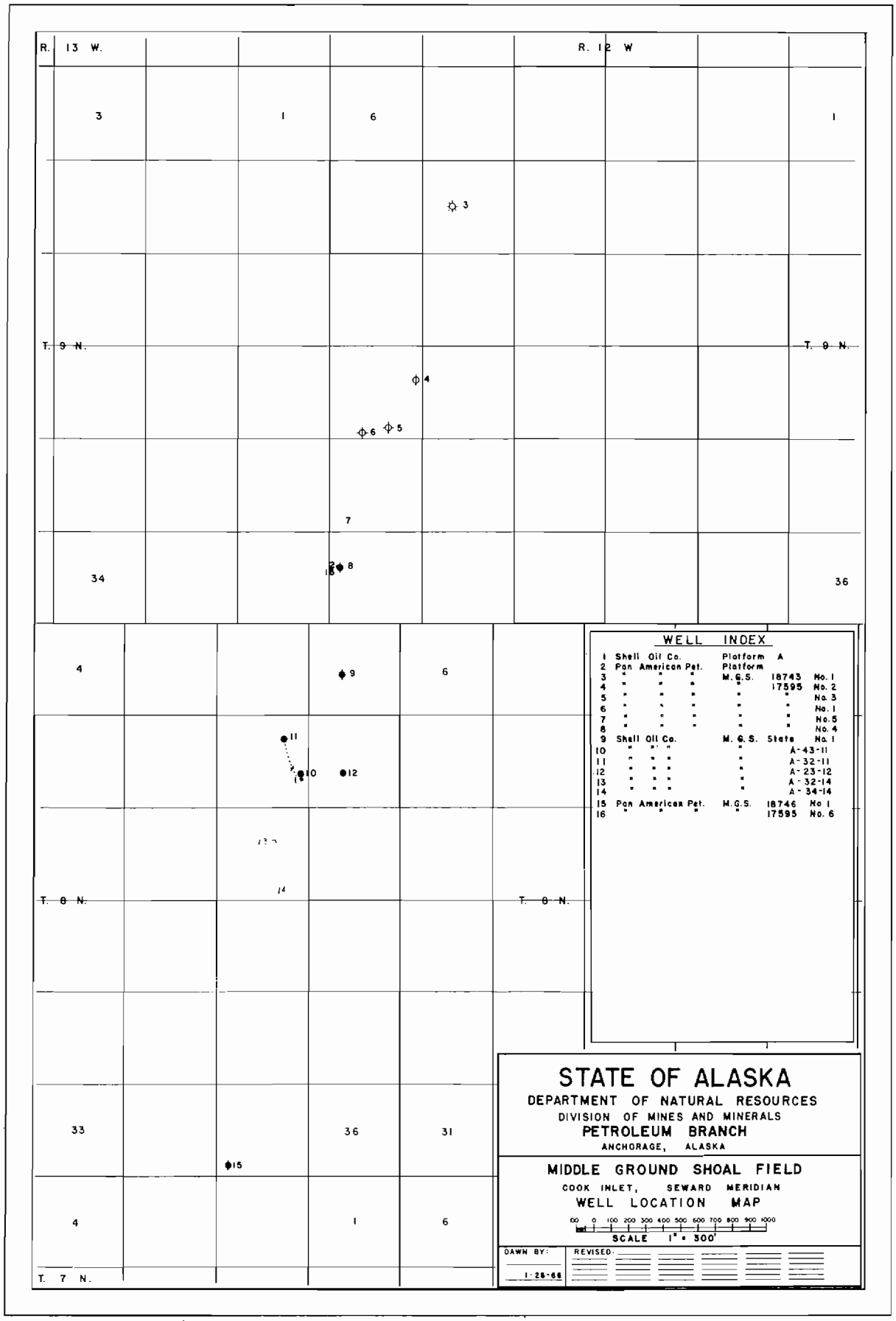
Table VIII

Middle Ground Shoal Field
Cook Inlet, Alaska

Shell Oil Company and
Pan American Petroleum Corporation, Operators

Location	T8 & 9N - R12 &13W, Seward Meridian
Discovery Well	Pan American Pet. Corp. MGS 17595 No. 1
Discovery Date	June 10, 1962
Producing Formation	
Oil	Middle Kenai Zone - 5,500'-6,200' Lower Kenai Zone - 7,100'-8,900'
Deepest Test	Pan American Pet. Corp. MGS 18743 No. 1 10,709'
Wells	
Oil - Flowing	3
Shut-in	2
Gas - Shut-in	1
Production Data - 1965	
Oil Production	27,457 bbls.
Water Production	862 bbls.
Gas Production - with oil	10,405 MCF
Cumulative Production 12/31/65	
Oil	27,457 bbls.
Water	862 bbls.
Gas - with oil	10,405 MCF
Reservoir Data	
Initial Reservoir Pressure	3,655 psi.
Reservoir Pressure 12/31/65	3,655 psi.
Saturation Pressure	1,500 ± psi.
Oil Gravity	36.0°-37.0° API
Temperature	160°F
Net Pay Thickness	170'-550'
Porosity	7-25%
Permeability	2-200 Mds.
Connate Water	35%
Formation Volume Factor	
Gas/Oil Ration	400 cf/bbl.

Figure 6


R. 13 W.
R. 12 W
T. 9 N.
T. 9 N.
T. 8 N.
T. 8 N.
T. 7 N.
WELL INDEX
1 Shell Oil Co. Platform A
2 Pan American Pet. Platform
3 " " " M.G.S. 18743 No. 1
4 " " " " 17595 No. 2
5 " " " " " No. 3
6 " " " " " No. 1
7 " " " " " No. 5
8 " " " " " No. 4
9 Shell Oil Co. M. G. S. State No. 1
10 " " " " A-43-11
11 " " " " A-32-11
12 " " " " A-23-12
13 " " " " A-32-14
14 " " " " A-34-14
15 Pan American Pet. M.G.S. 18746 No. 1
16 " " " " 17595 No. 6
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS
PETROLEUM BRANCH
ANCHORAGE, ALASKA
MIDDLE GROUND SHOAL FIELD
COOK INLET, SEWARD MERIDIAN
WELL LOCATION MAP
SCALE 1" = 500'
DRAWN BY:
1-25-68
REVISED

Kenai Gas Field
Kenai Peninsula, Alaska

Union Oil Company of California, Operator

Location	T4 & 5N - R11 & 12W, Seward Meridian
Discovery Well	Kenai Unit No. 14-6
Discovery Date	October 11, 1959
Producing Formation	Kenai 4,240'-5,728'
Deepest Test	No. 14-6 - 15,047'
Wells	
Producing	6 (incl. 4 dual - 2 of which producing 1 module)
Shut-in	
Shut-in	6 (incl. 2 dual - both modules shut-in)
Reservoir Data	
Initial Reservoir Pressure	1,900-2,400 psi.
Average Reservoir Pressure	1,900-2,400 psi.
Gas Gravity	.557
Temperature	102-105°F
Net Pay Thickness	9'-135'
Porosity	15-35%
Permeability	350-3,000 Mds.
Connate Water	18-35%
Developed Area	11,000 Acres

Production Statistics

	Number of Wells			Gas Produced - MCF	
Year	Producing	Shut-in	Water (bbls)	Year	Cumulative
1960	2	0	0	14,474	17,474
1961	3	2	0	214,718	232,192
1962	3	2	0	1,460,175	1,692,367
1963	3	2	0	3,105,539	4,797,906
1964	4	2	0	4,493,170	9,291,076
1965	6	6	0	5,985,342	15,276,418

Figure 7

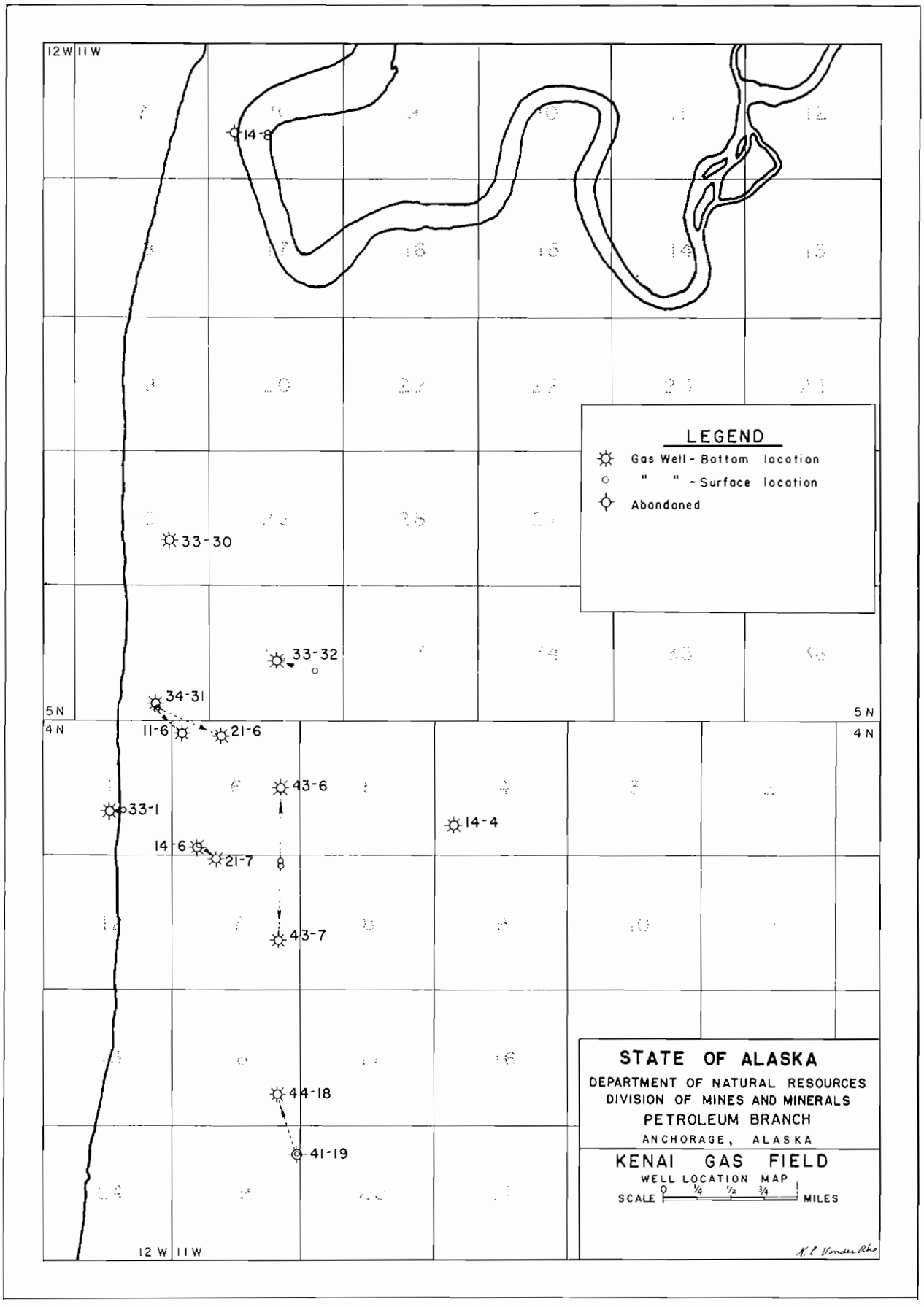

12W 11W
14-8
33-30
33-32
34-31
11-6
21-6
5N
4N
43-6
33-1
14-4
14-6
21-7
43-7
44-18
41-19
12W 11W
LEGEND
Gas Well - Bottom location
" " - Surface location
Abandoned
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS
PETROLEUM BRANCH
ANCHORAGE, ALASKA
KENAI GAS FIELD
WELL LOCATION MAP
SCALE 0 1/4 1/2 3/4 MILES

Figure 8

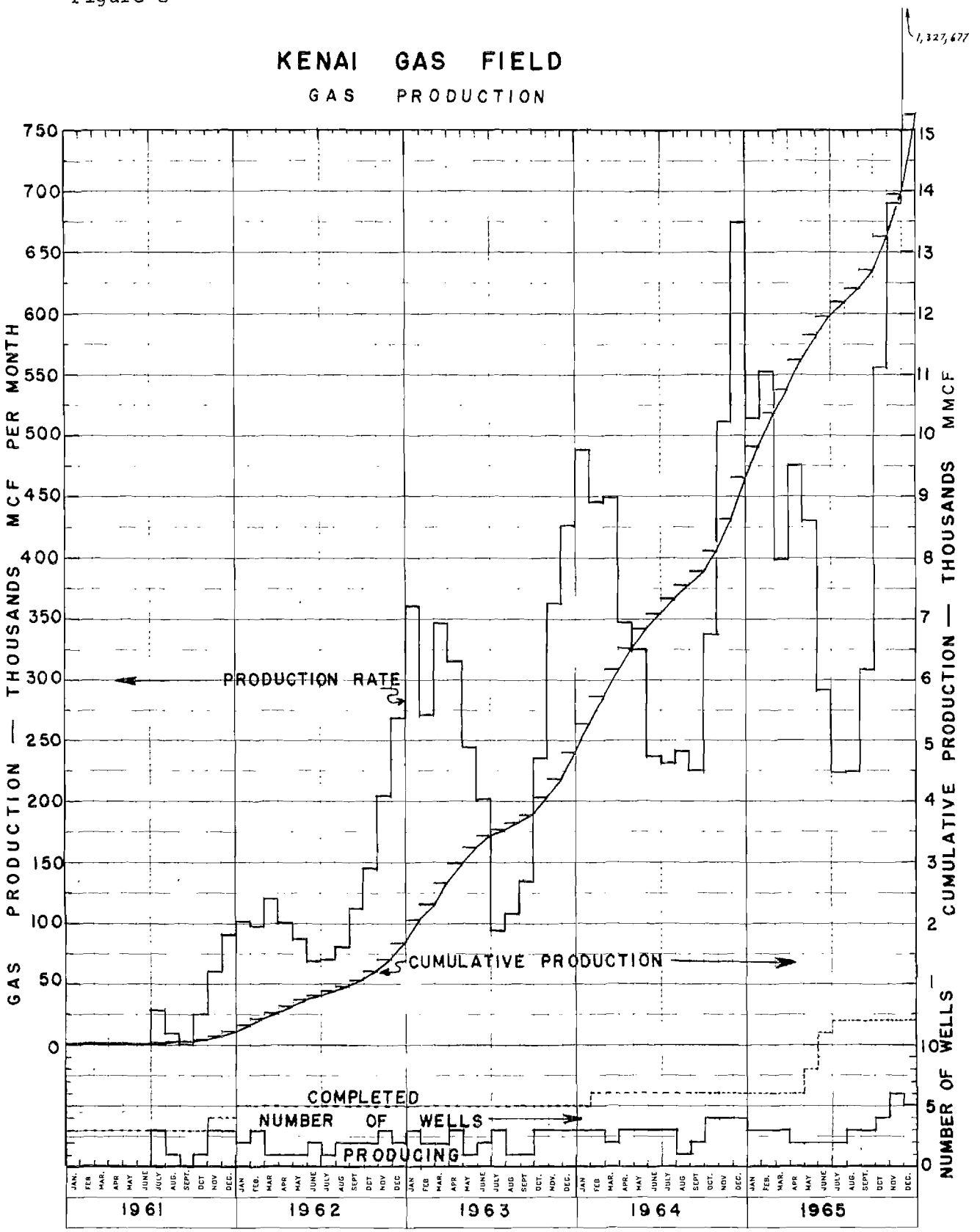

KENAI GAS FIELD
GAS PRODUCTION
1,327,677
GAS PRODUCTION — THOUSANDS MCF PER MONTH
CUMULATIVE PRODUCTION — THOUSANDS MMCF
NUMBER OF WELLS
PRODUCTION RATE
CUMULATIVE PRODUCTION
COMPLETED
NUMBER OF WELLS
PRODUCING
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
JAN. FEB MAR. APR MAY JUNE JULY AUG. SEPT. OCT NOV DEC.
1961
1962
1963
1964
1965

Table X

Sterling Gas Field
Kenai Peninsula, Alaska

Union Oil Company of California, Operator

Location	Sec. 15,T5N-R10W, Seward Meridian
Discovery Well	No. 23-15
Discovery Date	August 4, 1961
Producing Formation	Kenai 5250 - 54' (Perforations)
Deepest Test	No. 23-15 - 14,832'
Wells	
Producing	1
Shut-in	1
Reservoir Data	
Initial Reservoir Pressure	2,200-2,300 psi.
Average Reservoir Pressure	2,200-2,300 psi.
Gas Gravity	.569
Temperature	108-110°F
Net Pay Thickness	10-30
Porosity	
Permeability	
Connate Water	
Developed Area	1,500 Acres

Production Statistics

	Number of Wells			Gas Produced - MCF	
Year	Producing	Shut-in	Water (bbls)	Year	Cumulative
1962	1	0	0	25,186	25,186
1963	1	1	0	45,724	70,910
1964	1	1	0	58,383	129,293
1965	1	1	0	120,319	249,612

Figure 9

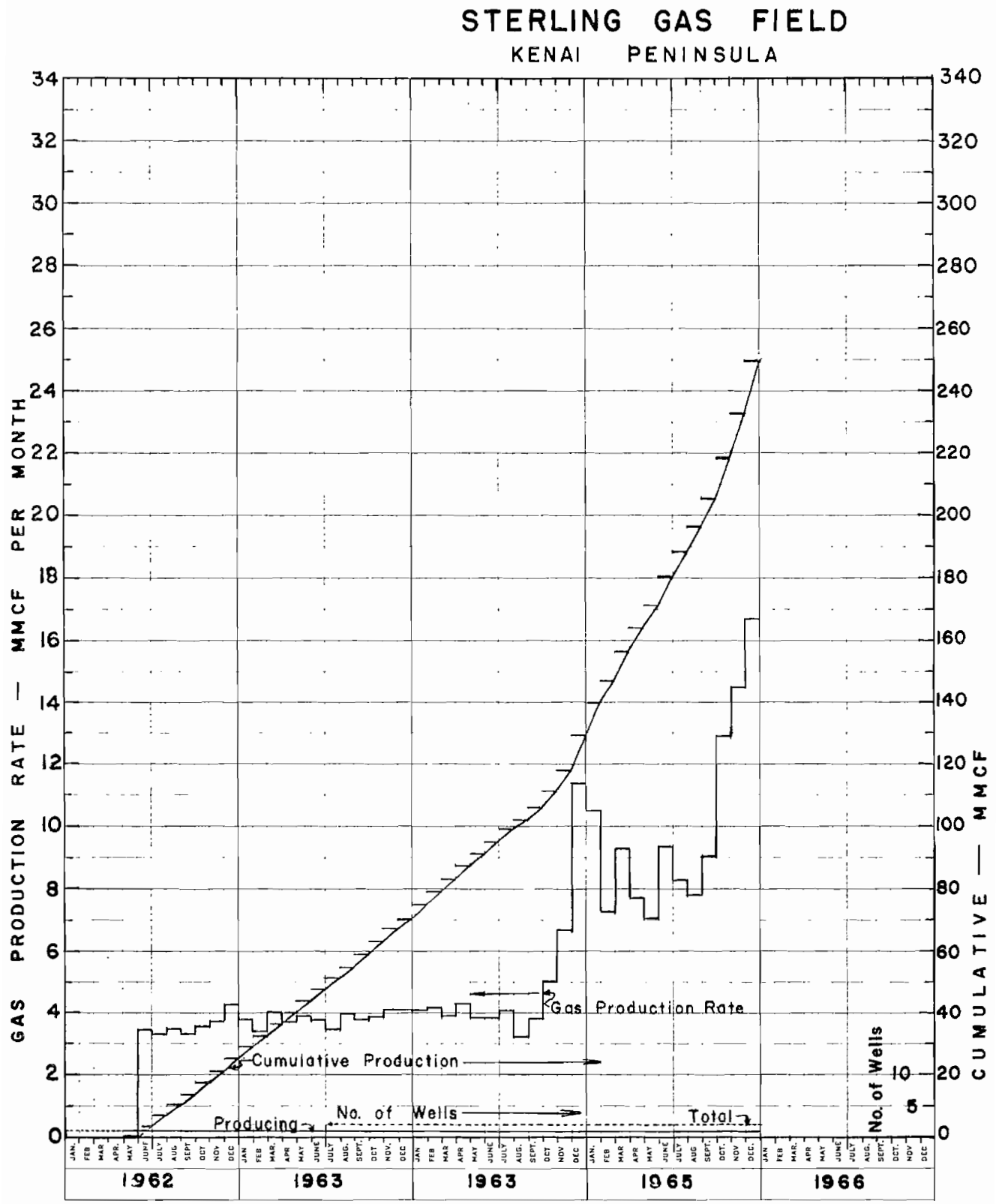

STERLING GAS FIELD
KENAI PENINSULA
GAS PRODUCTION RATE — MMCF PER MONTH
CUMULATIVE — MMCF
No. of Wells
Gas Production Rate
Cumulative Production
Producing
No. of Wells
Total
1962
1963
1963
1965
1966

Table XI

Swanson River Injection Project
Injection Statistics
Gas Injection Started November, 1962

Date	Number of Injection Wells		MCF Injected in month	Cumulative MCF Injected
1962, Nov.	1		32,710	32,710
Dec.	2		219,450	252,160
Total 1962			252,160	
1963, Jan.	2		298,399	550,559
Feb.	2		315,833	902,392
Mar.	3		524,071	1,426,463
Apr.	3		462,465	1,888,928
May	3		535,667	2,424,595
June	3		605,941	3,030,536
July	3		721,397	3,751,933
Aug.	3		647,810	4,399,743
Sept.	3		572,192	4,971,935
Oct.	3		624,597	5,596,532
Nov.	3		495,749	6,092,281
Dec.	3		475,999	6,568,280
Total 1963			6,316,120	
1964, Jan.	3		511,221	7,079,501
Feb.	3		460,168	7,539,669
Mar.	3		510,089	8,049,758
Apr.	3		560,464	8,610,222
May	3		536,545	9,146,767
June	3		503,394	9,650,161
July	3		489,652	10,139,813
Aug.	3		443,101	10,582,914
Sept.	3		410,716	10,993,630
Oct.	3		394,426	11,388,056
Nov.	3		351,715	11,739,771
Dec.	3		308,203	12,047,974
Total 1964			5,479,694	
1965, Jan.	3		353,917	12,401,891
Feb.	3		315,422	12,717,313
Mar.	3		389,707	13,107,020
Apr.	3		382,206	13,489,226
May	3		381,402	13,870,628
June	3		350,010	14,220,638
July	2		351,765	14,572,403
Aug.	3		344,363	14,916,766
Sept.	3	Rented Gas	338,299	15,255,065
Oct.	3	from Kenai Field	346,351	15,601,416
Nov.	3	66,694	369,694	15,971,110
Dec.	3	586,844	799,280	16,770,390
Total 1965		653,538	4,722,416	

SWANSON RIVER FIELD

GAS PRODUCTION AND INJECTION

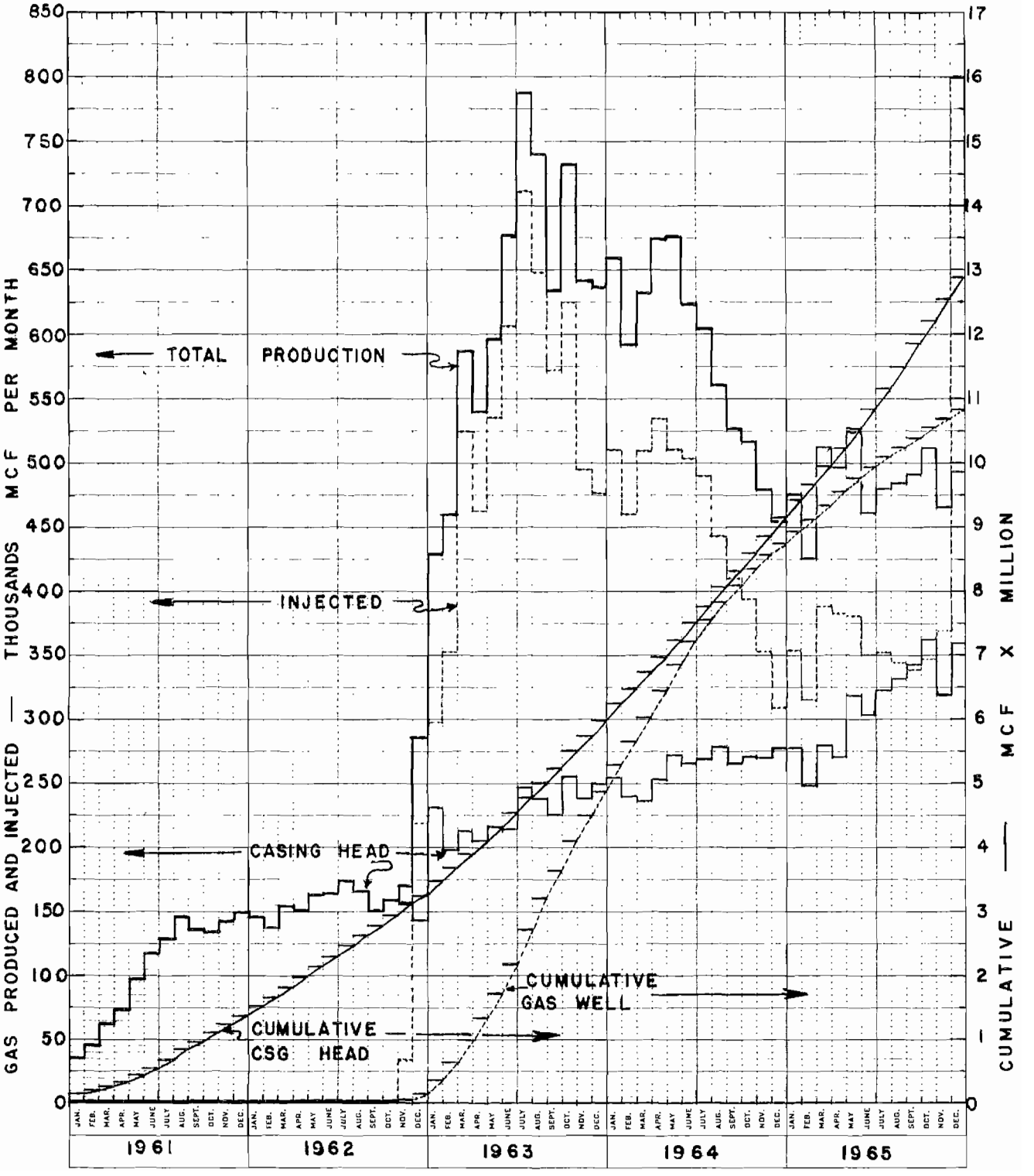


Table XII

GAS PRODUCTION

Swanson River Field

Year	Csg.Hd Hemlock Z.	Dry Gas Kenai Zone	Total	Blown or Lost	Used	Sold	Injected
Prior to 1959	5,502	0	5,502	5,502	- - -	- - -	- - -
1959	26,611	0	26,611	25,832	779	- - -	- - -
1960	96,700	19,760	116,460	58,342	56,593	1,525	- - -
1961	1,260,977	0	1,260,977	1,009,234	208,303	43,440	- - -
1962	1,866,275	153,212	2,019,487	1,439,366	233,107	94,854	252,160
1963	2,737,921	4,716,757	7,454,678	315,275	714,870	108,413	6,316,120
1964	3,152,531	3,844,655	6,997,186	616,763	777,836	122,893	5,479,694
1965	3,735,811	2,087,795	5,823,606	801,190	831,056	122,482	4,722,416
Total	12,882,328	10,822,179	23,704,507	4,271,504	2,822,544	493,607	16,770,390
Kenai Field							*Rented
Prior to 1961		17,474	17,474	898	- - -	16,576	- - -
1961		214,718	214,718	49	5,349	209,320	- - -
1962		1,460,175	1,460,175	347	3,673	1,456,155	- - -
1963		3,105,539	3,105,539	13	10,382	3,095,147	- - -
1964		**4,493,170	**4,493,170	1,156	6,297	**4,485,717	- - -
1965		5,985,342	5,985,342	14,858	27,192	5,943,292	653,538
Total		15,276,418	15,276,418	17,321	52,893	15,206,207	653,538
Sterling Field							
1962		25,186	25,186	14	466	24,706	- - -
1963		45,724	45,724	1	1	45,722	- - -
1964		58,383	58,383	500	203	57,680	- - -
1965		120,319	120,319	1,300	878	118,141	- - -
Total		249,612	249,612	1,815	1,548	246,249	
Middle Ground Shoal Field							
1965	10,405		10,405	10,405			
Birch Hill Field							
1965		63,700	63,700	63,700			
Total - All Fields							
1965	3,746,216	8,257,156	12,003,372	891,453	859,126	6,183,915	4,722,416
Cumulative	12,892,733	26,411,909	39,304,642	4,364,745	2,876,985	15,946,063	16,770,390

* Included in S.R. Field "injected" and Total - All Fields "sold" and "injected".

** Correction

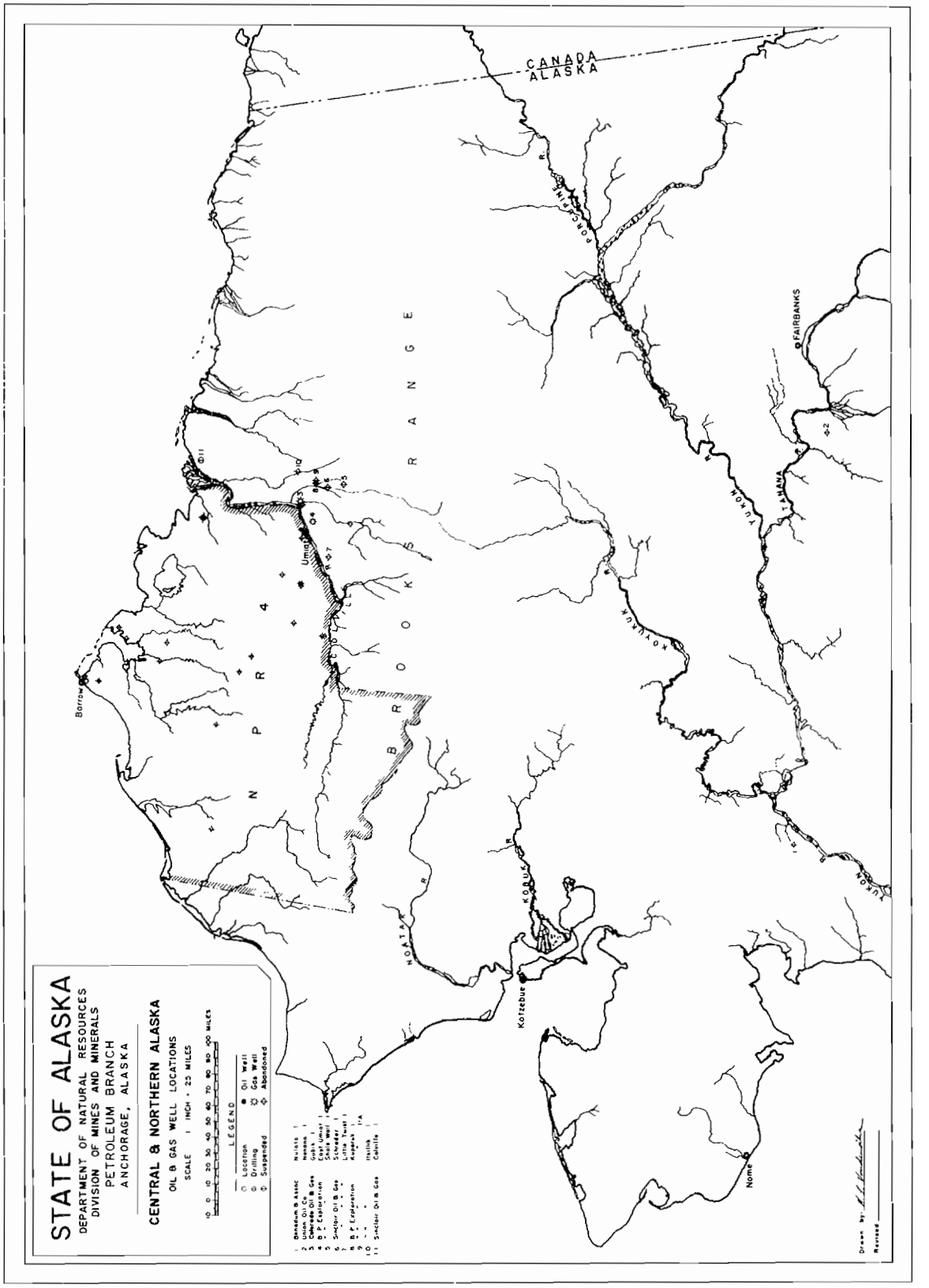

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS
PETROLEUM BRANCH
ANCHORAGE, ALASKA
CENTRAL & NORTHERN ALASKA
OIL & GAS WELL LOCATIONS
SCALE 1 INCH = 25 MILES
LEGEND
Location
Drilling
Suspended
Oil Well
Gas Well
Abandoned
CANADA
ALASKA
BROOKS RANGE
NPR 4
Barrow
Umiat
Kotzebue
Nome
FAIRBANKS
KOBUK R.
NOATAK R.
KOYUKUK R.
YUKON R.
PORCUPINE R.
TANANA R.
Drawn by:
Revised

Table XIII

Pursuant to Section 2008.1 of the Alaska Oil and Gas Conservation Regulations, well records for the following wells drilled in Alaska were released to the public during 1965 through local scouting services and reproduction firms in Anchorage:

Well Name & Number	Operator
Ninilchik No. 1	Union Oil Company of California
Anchor Point Unit No. 1	Standard Oil Company of California
Swanson River Unit No. 41A-15	Standard Oil Company of California
Beluga River Unit 212-35	Standard Oil Company of California
Beluga River Unit 212-25	Standard Oil Company of California
Swanson River Unit 14-22	Standard Oil Company of California
Beluga River Unit 232-4	Standard Oil Company of California
Tyonek State No. 1	Pan American Petroleum Corporation
Soldotna Creek Unit 21-8	Standard Oil Company of California
Swan Lake Unit No. 2	Sinclair Oil and Gas Company
Wasilla State No. 1	B.P. Exploration Company
Fritz Creek No. 1	Halbouty Alaska Oil Company
Swanson River Unit 21-34	Standard Oil Company of California
Beluga River Unit 233-27	Standard Oil Company of California
Soldotna Creek Unit 43-9	Standard Oil Company of California
Swanson River Unit 14-9	Standard Oil Company of California
Soldotna Creek Unit 22A-32	Standard Oil Company of California
Eureka No. 2	Aledo Oil Company
Swanson River Unit 34-28	Standard Oil Company of California
Swanson River Unit 14-15 (Remedial)	Standard Oil Company of California
Kenai Unit 43-9	Union Oil Company of California
Soldotna Creek Unit 21-16	Standard Oil Company of California
White River Unit No. 3	B.P. Exploration Company
Moose Creek No. 1	Pan American Petroleum Corporation
Knik Arm State No. 1	Union Oil Company of California
Middle Ground Shoal State No. 1	Shell Oil Company (S-R-S)
Wide Bay No. 1	Richfield Oil Corporation
Soldotna Creek Unit 23-3	Standard Oil Company of California
Gubik No. 1	Colorado Oil & Gas Company
Middle Ground Shoal State No. 2	Pan American Petroleum Corporation

Table XIV

Well Records to be Released During 1966
and their release dates

Well Name and Number	Operator	Date
Sandy River Federal #1	Gulf Oil Corp. of Calif.	1 - 3-66
Happy Valley Unit 31-32	Superior Oil Company	1 - 9-66
Kenai Unit 33-1	Union Oil Co. of California	3 -27-66
Shale Wall Unit #1	B.P. Exploration	4 - 7-66
Pure-Kahiltna Unit #1	Union Texas Petroleum	4 -11-66
Susitna State Unit #1	Humble Oil & Refining Co.	4 -12-66
Romig Park #1	Pan American Petroleum Corp.	4 -12-66
Salmon Berry Lake Unit #1	Socony Mobil Oil Company	4 -18-66
East Umiat #1	B.P. Exploration Company	4 -28-66
Schrader Unit #1	Sinclair Oil & Gas Company	5 -24-66
Beluga River Unit 14-19	Standard Oil Co. of Calif.	6 -15-66
Ninilchik Unit #1	Socony Mobil Oil Company	6 -22-66
Little Twist Unit #1	Sinclair Oil & Gas Company	7 - 7-66
Kuparuk Unit #1	B.P. Exploration Company	7 -15-66
Tyonek 17586 #2	Pan American Petroleum Corp.	7 -24-66
Kasilof State #1	Union Oil Co. of California	7 -28-66
Cook Inlet State 17589 #1 (old 1-A)	Pan American Petroleum Corp.	9 - 2-66
Kasilof State #2	Union Oil Co. of California	9 - 5-66
North Cook Inlet State #1	Shell Oil Company	10-13-66
Middle Ground Shoal State 17595 #1	Pan American Petroleum Corp.	11-13-66
Middle Ground Shoal State 17595 #3	Pan American Petroleum Corp.	12- 4-66
Kuparuk Unit #1 (retest)	B.P. Exploration Company	12-24-66
Middle Ground Shoal State 18743 #1	Pan American Petroleum Corp.	12-16-66
Kuparuk Unit #1-A	B.P. Exploration Company	12-26-66

See instructions on last page

DIVISION OF MINES AND MINERALS

SAMPLE & CORE INVENTORY
Table XV

Well samples & cores in sample storage
at 3001 Porcupine Drive, Anchorage, Alaska

*Destroyed by March 27, 1964 earthquake. Replacement is being attempted and any progress will be noted in subsequent inventories.

Sample Set No.	Public Release Date	Permit No.	Operator	Well and Number	Sample Interval	Cores
1	6 -15-60		Phillips Pet. Co.	Sullivan Unit #1	200-10013	
2	6 -15-60		Phillips Pet. Co.	Sullivan Unit #2	0-12000	yes
3	6 15-60		Anch. G & O Dev. Co.	Rosetta #1	1100-4245	
*4	6 -15-60		Anch. G & O Dev. Co.	Rosetta #3	120-6060	
5	6 -15-60		Colo. Oil & Gas Co.	Yakutat #1	772-9315	
5A	6 -15-60		Colo. Oil & Gas Co.	Yakutat #2	90-11570	
6	4 -4 -61		Humble Oil & Refg.	Bear Creek #1	0-14375	
7	5 -23-61		Colo. Oil & Gas Co.	Yakutat #3	1220-10820	
7A	5 -23-61		Colo. Oil & Gas Co.	Core Hole #1	50-3230	
7B	5 -23-61		Colo. Oil & Gas Co.	Core Hole #2	50-5690	
7C	5 -23-61		Colo. Oil & Gas Co.	Core Hole #3	30-5484	
7D	5 -23-61		Colo. Oil & Gas Co.	Core Hole #4	60-5326	
8	6 -13-61	2	Halbouty Alaska Oil	Halbouty-King #1	60-12030	yes
9	10-14-61	4	General Pet. Corp.	Great Basins Unit #1	0-11070	1360-11072
*10	11-11-61	3	Union Oil Co. of Calif.	Kenai Unit 14-6(1)	4180-15054	
11	11-13-61	8	Anch. G & O Dev. Co.	Rosetta #4	0-1619	
12	12-11-61	10	General Pet. Corp.	Great Basins Unit #2	15-8865	

Sample Set No.	Public Release Date	Permit No.	Operator	Well and Number	Sample Interval	Cores
13	12-19-61	12	Alaska Cons. Oil Co.	Iniskin U.-A. Zappa #1	0-11230	yes
*14	7 -7 -62	7	Richfield Oil Co.	Kaliakh Riv. Unit #1	1600-14699	
15	7 -20-62	6-61	Pan Am. Pet. Corp.	Napatuk Creek #1	0-14890	1-12
16	10-10-62	26	Halbouty Alaska Oil	Bishop Creek Unit 11-11(1)	40-9030	
17	10-26-62	24	Halbouty Alaska Oil	A O & M-King Oil 1-B	50-14019	yes
18	5 -24-63	42	Standard Oil Co. of Calif.	Falls Creek Unit #1	1370-13780	
19	9 -4 -63	14-61	Union Oil Co. of Calif.	Sterling Unit 23-15	0-14832	
20	9 -18-63	15-61	Richfield Oil Co.	Duktoth River Unit #1	1000-10360	
21	10-25-63	31-61	Standard Oil Co. of Calif.	Swan Lake 34-27 (1)	5200-11984	
22	11-7 -63	27-61	Hackathorn Drlg. Co.	Rosetta #4-A	1600-2405	
23	11-26-63	42-61	Pure Oil Company	Canoe Bay Unit #1	0-6642	
24	1 -24-64	21-62	Standard Oil Co. of Calif.	Anchor Point Unit #1	1030-14700	
25	3 -9 -64	48-61	Pan Am. Pet. Corp.	Stedatna Creek-State #1	120-7450	7139'-59'; 7452'-59'
26	4 -6 -64	3-62	Union Oil Co. of Calif.	Nenana #1	450-3030	
27	4 -25-64	55-61	Standard Oil Co. of Calif.	Soldotna Creek 34-16 (32)	990-11880	
28	4 -29-64	49-61	Pan Am. Pet. Corp.	West Foreland #1	30-13500	yes
29	5 -26-64	16-62	Standard Oil Co. of Calif.	West Fork Unit 233-16	0-6800	
30	6 -9 -64	50-61	Superior Oil Company	Chuit-State #1	200-12500	
31	6 -27-64	10-62	Union Oil Co. of Calif.	Pittman Unit	25-6140	
32	6 -31-64	5-62	British American	Bell Island Unit #1	0-11340	
33	8 -7 -64	25-62	Union Oil Co. of Calif.	Sterling Unit 43-28	1150-5630	

Sample Set No.	Public Release Date	Permit No.	Operator	Well and Number	Sample Interval	Cores
34	8 -26-64	7-62	Pan Am. Pet. Corp.	M.G.S. State #1	150-5200	
35	9 -23-64	8-62	Pan Am. Pet. Corp.	Cook Inlet State #1 (CI St. 17589 Well No. 1)	1600-12200	
36	9 -31-64	9-62	Standard Oil Co. of Calif.	Riou Bay Unit #1	0-14107	
37	10-4 -64	26-62	Superior Oil Company	Chuit State #2	225-9152	
*38	10-14-64	11-62	Shell Oil Company	SRS State #1	465-14041	
39	10-21-64	20-62	Standard Oil Co. of Calif.	Soldotna Creek Unit 22-32(34)	1000-14560	
40	11-22-64	22-62	Colo. Oil & Gas Co.	Malaspina Unit #1-A	2970-13823	yes
41	11-24-64	27-62	Union Oil Co. of Calif.	Tazlina #1	2970-8835	
42	11-25-64	12-62	B P Exploration Co.	White River Unit #2	10-12400	
43	11-25-64	23-62	Occidental Pet. Corp.	South Diamond Gulch #1	696-10558	
44	12-29-64	28-62	Pan Am. Pet. Corp.	Cook Inlet State #1-A	11920-12676	
45	1 -1 -65	24-62	Union Oil Co. of Calif.	Ninilchik State #1	200-14940	
46	1 -18-65	18-62	Standard Oil Co. of Calif.	Beluga River Unit #1	0-16440	
47	1 -28-65	33-62	Standard Oil Co. of Calif.	Beluga River Unit 212-25	300-5800	
48	3 -6 -65	15-62	Pan Am. Pet. Corp.	Tyonek State #1	1000-12490	yes
49	3 -6 -65	15-62	Pan Am. Pet. Corp.	Tyonek State #1-A	1200-13382	
50	3 -22-65	36-62	Sinclair Oil & Gas Co.	Swan Lake #2	146-6730	
51	3 -25-65	63-1	B P Exploration Co.	Wasilla State #1	0-4849	yes
52	4 -3 -65	63-5	Halbouty Alaska Oil	Fritz Creek #1	300-3790	
53	4 -25-65	63-2	Standard Oil Co. of Calif.	Beluga River Unit 233-27	300-5680	
54	5 -6 -65	32-62	Aledo Oil Company	Eureka #2	0-8546	yes
55	5 -14-65	29-62	Standard Oil Co. of Calif.	Swanson River Unit 14-9	200-14300	

Sample Set No.	Public Release Date	Permit No.	Operator	Well and Number	Sample Interval	Cores
56	5 -22-65	38-62	Standard Oil Co. of Calif.	Soldotna Creek Unit 22A-32	1000-14452	
57	8 -18-65	63-3	Pan Am. Pet. Corp.	Moose Creek Unit #1	600-7860	
*58	9 -29-65	63-15	Union Oil Co. of Calif.	Knik Arm State #1	180-6106	yes
*59	10-8 -65	63-4	B P Exploration Co.	White River Unit #3	30-6980	
60	10-17-65	35-62	Richfield Oil Corp.	Wide Bay State #1	100-12570	yes
61	10-18-65	63-9	Shell Oil Company	M.G.S. State #1	5014-9645	
62	12-12-65	63-13	Colo. Oil & Gas Co.	Gubik Unit #1	600-1500	
63	12-16-65	63-8	Pan Am. Pet. Corp.	M.G.S. State #2 (17595)	240-10899	core #1
64	1 -2 -66	63-14	Gulf Oil Company	Sandy River Federal #1	0-13068	yes
65	1 -9 -66	63-16	Superior Oil Company	Happy Valley Unit 31-22	0-13520	yes
66	4 -7 -66	63-25	B P Exploration Co.	Shale Wall Unit #1	0-4026	yes
67	4 -11-66	63-23	Union Texas	Pure-Kahiltna Riv. Unit #1	700-7265	yes
68	4 -12-66	63-19	Pan Am. Pet. Corp.	Romig Park Inc. #1	130-11560	
69	4 -12-66	63-22	Humble Oil & Refg.	Susitna State Unit #1	510-12550	yes
70	4 -18-66	63-21	Mobil Oil	Salmon Berry Lake #1	130-7910	
71	4 -28-66	63-24	B P Exploration Co.	East Umiat Unit #1	102-3340	yes
72	5 -24-66	64-4	Sinclair Oil & Gas Co.	Schrader Unit #1	4600-5129	yes
73	6 -15-66	63-20	Standard Oil Co. of Calif.	Beluga River Unit 14-19	215-14948	
74	6 -22-66	64-3	Mobil Oil	Ninilchik Unit #1	200-12710	yes
75	7 -6 -66	64-5	Sinclair Oil & Gas Co.	Little Twist Unit #1	170-3106	yes-1,2,3,4
76	7 -15-66	64-8	B P Exploration Co.	Kuparuk Unit #1	0-6570	yes
77	7 -24-66	63-6	Pan Am. Pet. Corp.	Tyonek State #2	220-12580	

LEGEND

- ANTIMONY
- BERYLLIUM
- CHROMITE
- COAL
- COPPER
- GOLD – SILVER
- IRON
- LEAD – ZINC
- MERCURY
- MOLYBDENUM
- NICKEL
- OIL – GAS FIELD
- PLATINUM
- SULFUR
- TIN
- TUNGSTEN
- ROAD
- RAILROAD
- POSSIBLE OIL PROVINCE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ALASKA

COMPILED FROM ALL AUTHENTIC SOURCES

Scale

BETTER-KNOWN MINERAL DEPOSITS, POSSIBLE PETROLEUM PROVINCES,

ALASKA STATE DIVISION OF MINES & MINERALS

ARCTIC OCEAN
BEAUFORT SEA
CHUKCHI SEA
NORTON SOUND
YUKON RIVER
NOME
BERING SEA
BRISTOL BAY
ALEUTIAN ISLANDS
GULF OF ALASKA
PACIFIC OCEAN

Sample Set No.	Public Release Date	Permit No.	Operator	Well and Number	Sample Interval	Cores
78	7 -28-66	64-2	Union Oil Co. of Calif.	Kasilof State #1	1500-16121	
79	9 -5 -66	64-9	Union Oil Co. of Calif.	Kasilof State #2	2050-6686	
80	10-13-66	63-18	Shell Oil Company	North Cook Inlet State #1	0-14850	
81	11-13-66	64-6	Pan Am. Pet. Corp.	M.G.S. State #4 (17595)	180-9203	yes
82	12-4 -66	64-7	Pan Am. Pet. Corp.	M.G.S. State #3 (17595)	130-11170	9608'-9624'; 10083'-10093'
83	12-15-66	64-10	Pan Am. Pet. Corp.	M.G.S. State #6 (18743 Well #1)	500-10709	
84	1 -8 -67	64-14	Union Oil Co. of Calif.	Kenai Unit 13-8	0-7751	
85	2 -4 -67	64-11	Humble Oil & Refg.	Tyonek Reserve #1		
86	4 -20-67	64-15	B P Exploration Co.	Itkillik Unit #1	0-7751	
87	6 -27-67	64-12	Pan Am. Pet. Corp.	West Foreland Unit #1	1700-11002	
88	7 -9 -67	65-1	Standard Oil Co. of Calif.	Birch Hill Unit #22-25	220-15500	
89	7 -20-67	65-4	Shell Oil Company	SRS-MGS State #A-1-3	320-9840	
90	7 -25-67	65-13	Union Oil Co. of Calif.	Trading Bay #1-A	170-6530	
91	8 -21-67	65-14	Pan Am. Pet. Corp.	Tyonek State 18742 #1	316-9505	yes
92	8 -24-67	65-18	Union Oil Co. of Calif.	Trading Bay #2	810-6620	
93	9 -5 -67	65-2	Mobil Oil Company	Granite Point #1 (State)	110-11565	
94	9 -11-67	11-62	Shell Oil Company	SRS State #1 (drld. deeper)	14040-16360	
95	10-1 -67	65-20	Union Oil Co. of Calif.	Trading Bay #3 State	800-7260	
96	11-17-67	65-19	Pan Am. Pet. Corp.	Tyonek State 17587 #2	630-12335	
97	11-17-67	65-22	Pan Am. Pet. Corp.	MGS State 18746 #1	260-10298	
98	12-7 -67	65-25	Union Oil Co. of Calif.	Grayling #1-A (McArthur River Field)	820-10227	

Sample Set No.	Public Release Date	Permit No.	Operator	Well and Number	Sample Interval	Cores

Instructions:

At release date, all samples will be available washed, dried, and in envelopes.

All sample boxes must be checked in and out of the sample room by the Petroleum Branch stenographer.

Well samples and cores may not be examined outside of the Petroleum Branch offices. All of the sample must be returned to the sample envelope.

Table XVI

Summary of Statistics

Years 1959 - 1965

	1959	1960	1961	1962	1963	1964	1965
Drilling Permits Approved	16	30	55	38	25	15	39
Exploratory Wells Spudded	8	10	25	31	16	16	24
Development Wells Spudded	8	16	29	10	9	2	13
Wells Completed (Oil)	3	13	27	7	8	2	9
Wells Completed (Gas)	3	3	5	5	4	5	10
Wells Abandoned	4	9	19	21	15	15	7
Footage Drilled, Exploratory	75,705	93,749	197,499	290,976	135,248	177,110	187,135
Footage Drilled, Development	62,197	166,592	302,989	78,619	80,337	7,499	81,236
Total Footage Drilled	137,902	260,341	500,488	369,595	215,585	184,609	268,371
Average No. Active Rotary Rigs	5	7	9	10	7	6	7
Average Daily Oil Production	510	1,529	17,333	28,107	29,424	30,285	30,409
State O & G lease acreage in effect at year's end		117,203	501,065	1,370,652	1,590,392	1,727,972	3,018,200
Federal O & G lease acreage in effect at year's end		33,287,120	26,807,695	19,550,312	14,035,381	11,589,149	*10,184,447
Federal payment of Oil and Gas lease rentals						$5,529,110	$3,425,393
Federal payment of Oil and Gas lease royalty						$3,374,603	$3,266,396
State Oil and Gas lease bonus						$5,511,769	$10,819,708
State Oil and Gas lease rental						$1,250,536	$2,656,402
State Oil and Gas lease royalty						$ 76,310	
					Total ------	$15,742,328	
State Oil and Gas lease acreage issued (does not include transferred Federal leases but does include 13th Competitive Sale)				662,852	378,550	856,633	910,443
				Competitive --	‡388,579	‡722,659	704,751
				Noncompetitive --	143,353	116,970	205,692
Federal Oil and Gas lease acreage transferred to State					86,127	6,413	16,520
Federal Oil and Gas lease acreage issued				683,246	996,616	2,609,714	2,083,010

*includes 10,384 acres of Indian lands.

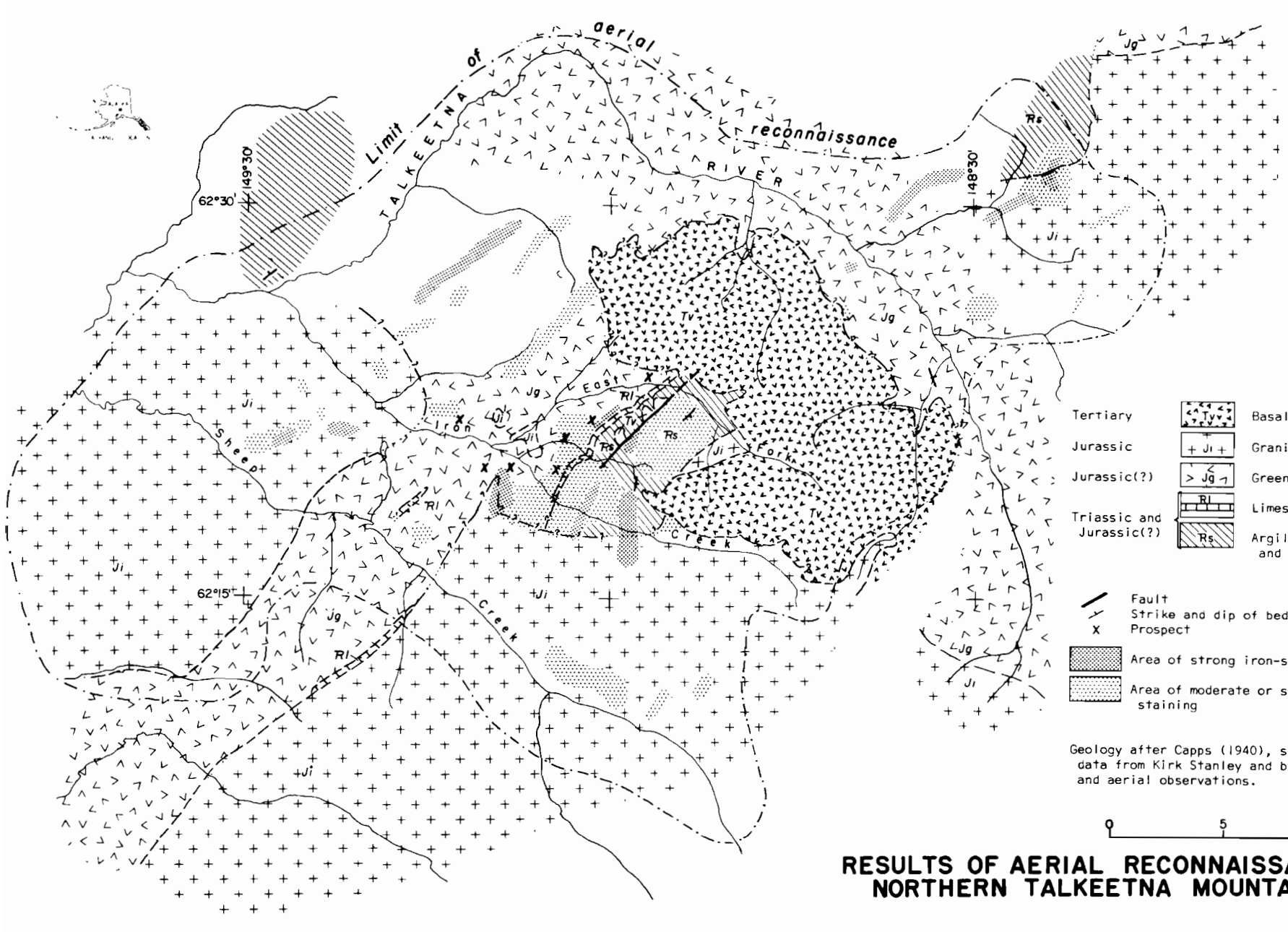
‡corrected by adjustment after default on certain tracts.

Summary of Statistics
(continued)

Years 1959 - 1965

	1959	1960	1961	1962	1963	1964	1965
Geologic Field Party Months	129	57.5	57.6	43	47	22	34
Seismic Crew Months	92.0	40.0	73.4	86.23	113	98	60
Gravity Crew Months	7.5	4.9	14.5	9.5	10	12	3
Magnetometer Crew Months						2	3
Exploration expenditures (includes geological & geophysical work, exploration drilling and administrative expense. Does Not include money spent for oil & gas leases acquired by individuals & out of State companies). (thousands)					$54,030	$61,000	$66,020
Development drilling expenditures (thousands)					$ 4,635	$ 696	$ 5,261
Production expenditures (including secondary recovery & platform construction in year of completion) (thousands)					$ 1,594	$ 1,758	$19,250
Refinery construction & operation expenditures (thousands)					$ 5,600	$ 2,200	$ 2,000
Pipeline construction expenditures (thousands)							$ 9,550
Total industry expenditures exclusive of marketing & sales activity (thousands)	$30,654	$37,805	$42,405	$65,500	$65, 859	$65,654	$102,081
Full time year around employees of oil industry excluding marketing				613	655	671	708
Petroleum marketing personnel							1,508
Cumulative mileage low grade roads & seismic trails built by oil industry				885	1,185	2,245	2,908
Cumulative mileage heavy duty roads built by oil industry				331	370	374	389
Total crude throughput - Alaskan Refinery, barrels (thousands				2,600	5,994	5,900*	

*estimate - exact figures will be available in next report



RESULTS OF AERIAL RECONNAISSANCE NORTHERN TALKEETNA MOUNTAINS

Figure 12

REPORTS

AN AERIAL RECONNAISSANCE IN THE NORTHERN TALKEETNA MOUNTAINS

By

Arthur W. Rose
Mining Geologist

INTRODUCTION

A major problem of mineral prospecting and of planning economically-oriented geologic mapping programs in Alaska is selecting areas for detailed study. Although many mineral occurrences are known and reported in the literature the intensity of prospecting in most areas has been relatively low, and a large proportion of significant showings is probably yet to be found. Because many of the known showings have received attention from more than one prospector or exploration geologist, the discovery of new prospects is in many respects the most attractive way of finding a minable ore deposit. Moreover, in many regions, the geology is not always of much help in selecting areas for prospecting and detailed work because of the lack of adequate geologic maps. Aerial reconnaissance is rapid, relatively inexpensive, and has been much used in Western U.S. and elsewhere. It should be an excellent method in Alaska for delineating favorable exploration areas in regions of good exposure where geologic information is limited.

Sulfide ore deposits nearly always contain important amounts of iron sulfides. The weathering of these sulfides produces limonite, which stains the rock a red, brown, or orange color. This iron-stained weathered rock is commonly known as "gossan", or "leached capping". The objective of this aerial reconnaissance was to record all patches of iron-staining that could be seen from the air in the hope that areas suitable for more detailed study on the ground would be found. Obviously, iron-sulfides occur in many geologic environments unrelated to ore, and red-stained rocks originate in other ways, such as weathering of biotites and other mafic minerals, so most of the red-stained patches will probably be of no economic interest;however, the method does allow one to select areas of possible interest from much larger areas that are probably barren of large outcropping sulfide ore deposits. It should be noted that other methods are necessary to find deposits that do not outcrop, or types of deposit that do not have readily-weathered iron-bearing minerals associated with them. Aerial reconnaissance by light plane (or by color air photos) is most readily applicable to search for the large porphyry copper type of ore deposit. However, smaller ore bodies of other types may also be located by observation of iron staining, especially if they contain pyrite or are surrounded by a pyritic halo.

Because of the presence of granitic intrusives and the existence of other mineral showings along the borders of the Talkeetna geanticline (Herreid, 1964), the Talkeetna Mountains seem a relatively favorable area for mineral

deposits. However, geologic mapping is very incomplete, and only a few prospects are known. Much of the range rises above timberline and is readily amenable to aerial observation. The Alaska Railroad and a new highway are about 10 miles west of the area shown on the map, so access to any new mine would be relatively easy. These reasons, plus the nearness to Anchorage, led to selection of the northern Talkeetnas for aerial reconnaissance.

Discussion of Geology and Field Work

The known mineral showings in the northern Talkeetna Mountains are copper-iron prospects on Iron Creek, molybdenum shows on Portage Creek, silver prospects on Portage Creek and Gold Creek, and small gold placers on the eastern slopes of the range (Cobb & Kachadoorian, 1961; Richter, 1964; Holdsworth, 1953).

As a test of the method on known mineralization, the Iron Creek area was selected for initial work. The mineralization in this area consists of hematite, chalcopyrite, bornite, arsenopyrite, pyrite, quartz, and epidote replacing greenstone along shear zones. At the Marion or Talkeetna prospect on Prospect Creek (see the Talkeetna Mountains B-5 quadrangle), Stanley (1965) reports an average grade of 30% iron, 0.8% copper, 0.07 ounces per ton of gold, and 0.1 ounces per ton of silver for a mineralized zone about 200 feet long and at least 100 feet thick exposed on a steep hillside. The zone is near the hanging wall side of a shear zone striking about N70E and dipping northwest. Other prospects expose similar mineralization.

In order to observe the colors properly, a sunny day with few or no clouds was considered necessary. Also, there should be no strong winds which would cause flying difficulties. Between August 15 and September 15, 1965, only three or four days met these qualifications, but because of other commitments, only one day of flying could be done. The plane used was a Cessna 180 based in Anchorage. Approximately 5½ hours of flying was done to cover the area outlined on the map for a cost of about 35¢ per square mile of coverage. This includes about one and one-half hours flying to and from the area. The plane was flown at an elevation slightly lower than that of the higher peaks (5000-6000 feet in most parts of the area). Stained areas were outlined on 1°=1 mile topographic maps, and brief notes on their color and intensity made. Notes were also made on the apparent rock types and structure.

In the office, geologic data in the literature (Capps, 1919, 1940) was supplemented by discussions with Mr. Kirk Stanley, an Anchorage geologist who has mapped in the Iron Creek area, and by study of air photos of most of the area (kindly loaned by Mr. Stanley). The geology shown on the map is reconnaissance in nature, but is believed to be more accurate than previously published work.

The oldest rocks in the area are a series of northeast-trending limestone argillite, slate, greywacke, and chert, apparently with some interlayered

volcanic material. These rocks have been tentatively correlated (Capps, 1919; Chapin, 1918) with Triassic sediments farther north. Andesitic greenstone is abundant in the area, and is presumed to correlate with the Jurassic Talkeetna formation. Intrusive into the greenstone and sediments are several large bodies of granitic rock, plus a number of small stocks and plugs. These intrusives are considered to be Middle Jurassic in age. Unconformably overlying the older rocks is a sequence of tuffs and basaltic flows of probable Tertiary age. The flows and tuffs are relatively flat-lying, and appear on the air photos to be more extensive than shown on previous maps. Glacial deposits and stream alluvium mantle the flatter areas and the valley bottoms. Topography in the area is mainly glacial in origin, with cirques and steep-sided valleys the rule in the higher areas. Trees and brush largely conceal the bedrock up to an elevation of about 3000 feet along the Talkeetna River, Iron Creek and Sheep Creek.

A large proportion of the iron-stained patches occur in the greenstone, and the larger ones tend to have a northeasterly elongation. This probably reflects control of pyrite occurrence by faults or bedding and flow attitudes. A definite concentration of staining is noted in the vicinity of the copper-iron prospects of the Iron Creek area, confirming the usefulness of the method in picking areas of interest.

In addition to the Iron Creek area, the stained areas in the granitic rocks between Sheep Creek and Iron Creek, and northeast of the Talkeetna River are believed to especially warrant investigation on the ground. Other stained areas may warrant attention for small to moderate-size sulfide deposits. The possibility of ore bodies covered by post-ore Tertiary volcanics is suggested by a few stained areas that apparently extend beneath the cover.

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DIVISION OF MINES AND MINERALS

General

The Division of Mines and Minerals was created to aid and promote increased mineral exploration and production in the State of Alaska. In actual practice, it is doing everything within its means to foster and encourage mineral exploratory work and new production in the best interests of the State.

The Division administers the laws with respect to mining and petroleum exploration and production and mine safety. It operates public assay laboratories for the purpose of aiding bona fide prospectors and miners with free assays and mineral identifications. It does the geological mapping and other functions of a state geological survey. It provides technical advice in the field and office on prospecting and mining problems. The Division conducts a continuing survey of the mineral resources and operations in the State and disseminates this information for the assistance of prospectors, miners, and petroleum operators. Oil and gas conservation regulations are administered and enforced. By law, the Division is required to foster and promote the best interests of the mining, minerals, and related industries of the State, but it is also charged with the protection of investors in these industries. It maintains an active file or inventory of all known mineral deposits, mining claims, and mining claim owners. It provides the Division of Lands with necessary technical help and advice in mineral leasing and other related matters administered by that Division.

The Division of Mines and Minerals' authority and functions as delegated by the Commissioner of Natural Resources are found in Alaska Statutes, Titles 27 and 31.

Charts and tables on the following pages give a brief over-all view of the Division organization, personnel, functions, and a summary of work accomplished in 1965 and planned for 1966.

Petroleum Branch Activities

Thirty-nine permits to drill oil and gas wells were processed by the Petroleum Branch in 1965. This is more than 2½ times the number processed in 1964. Approval was given of technical information on new Federal unit outlines, changes in unit areas, and plans for development. Approval was also given for offshore production facilities and for the disposal of salt water from the onshore oil treating facilities which will process Middle Ground Shoal crude.

Operations and reports on all wells drilled for oil and gas in the State were inspected for compliance with State operating regulations. All drillstem tests and production tests were witnessed when a request for a 5% royalty award or a change in lease status was involved, or when conservation problems appeared imminent. Technical data pertaining to the 5% discovery incentive royalty were approved on the Trading Bay and Granite Point structures, both of which lie in Cook Inlet waters.

All Oil and gas production data were tabulated and the producing facilities were checked for meter accuracy. State, Federal, and private agencies rely on the Petroleum Branch for current petroleum production statistics as well as regular monthly and annual reports of industry activity. State tax and royalty income estimates were prepared for the State budget.

The two-year confidential period for samples and cores from ten additional oil and gas wells expired, and these were made available for study at the Petroleum Branch offices in the new Division of Mines and Minerals building at Anchorage. Public use of well samples and cores rose sharply with the completion of the new facilities. The new building lies approximately 4 blocks northeast of Merrill Field in the Mountain View area of Anchorage. Electric logs, lithology logs, and reports were made available to the public on an additional 30 wells.

Five Oil and Gas Conservation Committee orders were issued. Four orders dealt with individual well spacing and one order concerned field-wide spacing in the Kenai Gas Field. A public hearing was held July 13, 1965, to consider proposed regulations concerning shallow offshore drilling and coring operations.

Since its inception in 1959, the Petroleum Branch has consisted of one petroleum geologist and one petroleum engineer. The Petroleum Branch staff is now being increased by an additional geologist, engineer, and clerk-steno. A Petroleum Branch Supervisor was appointed.

SUMMARY OF WORK ACCOMPLISHED IN 1965

DIRECTOR

Directed the professional staff in investigations of mineral deposits, petroleum reservoirs, economic geology, geochemistry, and laboratory analyses; in the regulation of petroleum drilling and production; and in mine safety.

ADMINISTRATION BRANCH

Accounting, budgeting personnel, property, public information, publishing all reports and monthly bulletin (circulation 1900), 2278 claim location notices and 7254 affidavits processed, 9532 unpatented claims now on file, 525 visitors assisted, 1636 requests for information and sample received, 524 reports sold, 1075 information circulars mailed, 2701 letters out.

MINING BRANCH

Geochemical samples in 16 areas, 1014 samples taken, reports written, 41 coal mine and 2 lode mine safety inspections, Prospector Assistance Program, monthly bulletin, technical assistance to individuals and companies.

METALLURGY BRANCH

Received 1462 samples, completed 1872 analyses and identifications, assisted 1739 visitors.

PETROLEUM BRANCH

Approved 39 well drilling permits, administered petroleum conservation regulations, witnessed tests for discovery royalty purposes, inventoried and stored well samples for later research, compiled production and related statistics, gave technical advice to Division of Lands in leasing and unitization matters.

GEOLOGY BRANCH

403 square miles of geology mapped, economic geologic reports prepared, 1000 geochemical samples taken during geologic mapping, information furnished to mining company geologists and to prospectors, advised prospectors in the field.

ORGANIZATION, FUNCTIONS, AND COSTS

DIRECTOR

ADMINISTRATION BRANCH	MINING BRANCH	METALLURGY BRANCH	PETROLEUM BRANCH	GEOLOGY BRANCH
Authorized Personnel				
Administrative Ass't Minerals Analyst Secretary Office Manager	4 Mining Engrs.	X-ray Mineralogist Assayer Chemist Assayer	Petro. Supervisor 2 Petro. Engineers Petro. Geologist Clerk Steno	3 Mining Geologists Clerk Typist
Functions				
Mineral records & information	Prospect examination goechem sampling & reports	Ore assaying geochemical, & other analyses	Administration of conservation regulations	Ore province evaluation
Publishing	Safety inspections Public inquiries	Mineral identification	Technical aspects of unitization & leasing regulations	Ore deposit investigations
Budget, finance, property & personnel	Technical advice & help to prospectors and miners	Ore testing Research	Public inquiries Care & release of well logs & samples	Economic geology reports & maps
Locations				
Juneau Anchorage	Juneau Anchorage Fairbanks	Anchorage College	Anchorage	Anchorage
Costs (FY 65-66 Appropriations)				
53,700	57,900	70,700	89,700	65,800

Division Total $337,800

Geologic Field Work 1965

The results of the 1965 field work undertaken by the Division's economic geologists and mining engineers are summarized in the following brief reports. These summaries are published here to show the type of work being done and to show the results of the investigations in brief. Complete detailed reports on these projects will be printed and offered for sale before the 1966 field season begins. Notice will be given in the Division's monthly Mines and Petroleum Bulletin as these reports become available. A list of forthcoming reports as well as past reports available will be found in this volume following the summary of the Prospector Assistance Program.

HOLLIS, Prince of Wales Island, Southeastern Alaska (30)*

G. Herreid, A. Rose, Mining Geologists
40 square miles mapped, 100 stream sediment samples
May 17-31, 1965

Zinc, Lead, Copper, Molybdenum, Gold

Hollis has been the scene of considerable early day mining activity and within the last 10 years the accessibility and exposures have been greatly improved by the construction of logging roads in much of the area. Herbert and Race (1964) found numerous geochemical stream sediment anomalies for zinc, copper, and molybdenum. In 1965 these geochemical anomalies were confirmed and the areal geology was mapped in the eastern part of the area. A thick WSW-dipping sequence of andesitic graywacke, black slate, and agglomerate underlies Harris Peak and is separated by a broad zone of shearing from similar rocks north of Maybeso Creek. The deposits on which development work has been done are gold-quartz-pyrite fissure veins with minor galena, sphalerite, and chalcopyrite.

The veins occur mainly in the Granite Mountain intrusive and in black slate near Hollis, and are commonly in faults along the margins of dikes.

Approximately half of the 215 stream sediment samples collected in 1964 and 1965 are anomalous, with zinc being the most commonly anomalous metal. Copper, lead, and molybdenum anomalies are present in 10-20% of the samples. Zinc values as high as 4000 parts per million (0.4%) are present. Five geographic groups of anomalies have been recognized, and numerous scattered anomalies are outside the groups. Three of the five groups, including the strongest anomalies, are in areas with no known mineral showings. Further prospecting is strongly recommended in an area on the north side of Maybeso Creek with the strongest anomalies in zinc, copper, and molybdenum. This area is on the projection of a zone of strong shearing which lies farther east.

*Numbers in parentheses refer to locations shown on page 74.

SINUK RIVER AREA, Seward Peninsula (2)

G. Herreid, Mining Geologist
30 square miles mapped, 150 geochemical samples
June 15 - July 8, 1965

Lead, Zinc, Fluorite

The geology and stream sediment geochemistry were mapped in the area of the Sinuk River gossan iron deposits. This area is underlain by interlayered marble and schist with recumbent folding which plunges gently south. The deposits occur along faults that cut the marble and along marble-schist contacts. The limonite of the gossans and the streams draining them contain only background amounts of copper, lead, zinc, and molybdenum, but the adjacent marble at the major gossan in the area is locally anomalous in zinc, and lead. An interesting lead-zinc soil anomaly measuring approximately 1500 feet by 5000 feet was found. It is associated with exposures of low-grade lead-zinc-fluorite that occurs along a marble-schist contact.

INMACHUCK RIVER AREA, Seward Peninsula (1)

G. Herreid, Mining Geologist
75 square miles mapped, 140 geochemical samples
July 13-31, 1965

Gold, Lead, Zinc, Tin

The Hannum Creek lead-zinc-silver prospect was mapped and soil sampled in some detail. Strong lead-zinc soil anomalies were found to be closely associated with the showings exposed in the trenches. Further trenching would be most efficiently done in conjunction with further soil sampling. Sediments in the two creeks draining the deposit were found to be strongly to moderately anomalous in lead-zinc immediately below the deposits.

In addition to this detailed work, systematic stream sediment sampling and geologic reconnaissance mapping were conducted in an area extending 12 miles SSE and 2 miles NNW of Hannum Creek. No copper-lead-zinc anomalies were discovered in this area except for those associated with the Hannum Creek deposits. Tin samples have not been analyzed at this writing. A little fluorite was found in a granite body at the head of American Creek.

NIXON FORK AREA (3)

G. Herreid, Mining Geologist
20 square miles mapped, 100 geochemical samples taken
in a 60 square mile area
August 17-September 15, 1965

Gold, Copper

The areal geology and stream sediment geochemistry were mapped in and around the Nixon Fork intrusive and the gold-copper mines which are located along its margin.

Moderate anomalies in copper, lead, and occasionally zinc, are present in the soils below known mineralized zones. Field geochemical testing on fine, unscreened, undried soil or sediment using amonium citrate extractant and dithizone detected the stronger anomalies with good success, but was erratic on the weaker ones. Stream sediments (excluding Ruby Creek, which is contaminated by mill tailings) contained moderately anomalous amounts of copper or zinc only sporadically and near known ore deposits. The numerous prospects in the Mystery Creek drainage are not reflected by stream sediment anomalies in Mystery Creek.

Conditions are not favorable for the migration of copper for long distances in the streams in the Nixon Fork area because of carbonate bedrock. The only two anomalous stream sediment samples that are not located below known mineral deposits are anomalous in zinc rather than copper. These are only moderately anomalous, but bear investigation because of the generally low level of metal content in the stream sediments.

TWELVEMILE CREEK, Prince of Wales Island (30)

G. Herreid and A. Rose, Mining Geologists
20 square miles mapped, 10 stream sediment samples
May 12-15, 1965

Copper and other metals

Several stream sediment anomalies for copper and zinc, along with chalcopyrite showings, were found in this logging area by Division of Mines and Minerals personnel in 1964. Reconnaissance geologic mapping shows that greenstone schist, meta-graywacke, black phyllite, and marble of the lower Paleozoic Wales group are folded and deformed along east-west trends in the southern part of the area. Relatively unmetamorphosed graywacke, siltstone, argillite slate, and andesite of possible Devonian age are present to the north of the Wales group. Dikes and small intrusives of diabase, andesite, and diorite cut the above rocks.

Two old prospects were examined during the work, and traces of chalcopyrite were observed in a number of places. The exposed mineralization appears spotty and low-grade. Nine stream sediment samples are weakly to moderately anomalous in copper, zinc, lead, and/or molybdenum.

AMPHITHEATRE MOUNTAINS, Central Alaska Range (12)

A. Rose, Mining Geologist
25 square miles mapped, 30 stream sediment samples
June 17-26, 1965
Copper, Iron

Stream sediment sampling disclosed several anomalies in this area during the 1964 Paxson project. A series of Triassic(?) andesites, basalts, tuffs, and sediments is intruded by large bodies of gabbro and smaller bodies of ultramafic rocks. At least part of the largest gabbro body appears to be layered, and other gabbro occurs as sills. A layer of magnetite-rich gabbro about 150 feet thick contains about 22% iron, but magnetic concentrates

indicate about 20% ilmenite is present with the magnetite. Resampling of the stream sediment anomalies showed much weaker anomalies in the new samples, the original samples apparently being in error. However, several new moderate anomalies in copper were detected.

NORTHERN TALKEETNA MOUNTAINS (11)

A.Rose, Mining Geologist
800 square miles of aerial reconnaissance
August 27, 1965

Copper, Iron

See separate report in this volume

EKLUTNA, Chugach Mountains (17)

A. Rose, Mining Geologist
18 square miles mapped, 6 stream sediment samples
June 7-14, August 16-24, 1965

Chromite

Several chromite occurrences are known in an ultramafic intrusive between Anchorage and Palmer. The extent of this intrusive was mapped, and the rock types within the intrusive were distinguished. These range from dunite through layered pyroxenite-peridotite to small amounts of gabbro. The chromite occurs only in the dunite zone. Several small previously unreported chromite occurrences were found. Country rocks of the ultramafic intrusive include graywacke, argillite, banded chert, meta-andesite, and diorite, and small amounts of limestone.

EUREKA CREEK, Central Alaska Range (10)

A. Rose, Mining Geologist
40 square miles mapped, 103 stream sediment samples
June 27-August 6, 1965

Copper, Nickel, Gold, Asbestos, Iron

This area lies west of the Rainy Creek area mapped in 1964 and east of the Denali-Maclaren River area mapped in 1963. The K-M copper prospect is located in the latter area just west of the area covered this year. About 10 days were spent in further investigation of the area mapped in 1964.

Rocks present in the Eureka Creek area are pre-Pennsylvanian(?) schist; Mississippian and/or Pennsylvanian andesitic volcanics and volcanic sediments; Triassic(?) argillite, limestone and basalt; Mesozoic granitic and ultramafic intrusives; and Tertiary sediments. The large thrust fault mapped along the north side of the Rainy Creek area is cut off by cross faulting in Broxson

Gulch and is not apparent farther west. Ultramafic rocks are much less extensive than in the Rainy Creek area. Three granitic bodies form a large proportion of the exposures in the western half of the area.

One small copper show, several small asbestos occurrences, and one small contact metamorphic magnetite occurrence were found. Numerous weak to moderate stream sediment anomalies, mainly in zinc and copper, were detected.

SLANA DISTRICT, eastern Alaska Range (13)

D. Richter, Mining Geologist
115 square miles mapped
June 2-30, July 10-August 10, August 15-September 11, 1965

Gold, Silver, Lead, Copper, Zinc, Molybdenum

The geological and geochemical investigations begun in the Slana District in 1963 have been completed. In the three years of study approximately 225 square miles have been mapped at a scale of 1 inch=½ mile and more than 500 stream sediment samples collected and analyzed for heavy metal content. A preliminary geologic report on the Ahtell Creek area was published in May 1964 and a geochemical report on the first two years study was published in March 1965. A comprehensive geological-geochemical report on the entire Slana District will be completed in the spring of 1966. In 1963 a vein-type silver-lead deposit was discovered during the course of the field investigation. This occurrence is presently being explored by private capital.

The dominant economic geologic feature in the Slana District is a complex zoned quartz monzonite pluton. This pluton trends northerly across the regional structural grain of the country and passively intrudes a thick series of Pennsylvanian(?) volcanic rocks and Permian clastic sediments. In general the pluton exhibits three zones: a coarse-grained porphyritic core, a medium-grained equigranular intermediate zone, and a heterogeneous fine-grained border zone. The border zone consists of fine-grained quartz monzonite, silica-carbonate rock, silica-tourmaline rock, potash feldspar rock, and partially assimilated remnants of country rocks.

Along the entire northeastside of the district a complex stock of diorite-quartz diorite is exposed. The rock is extremely heterogeneous ranging from dark fine-grained biotite diorite and coarse-grained pyroxenite to light, coarse-grained hornblende-biotite quartz diorite. Many of the mappable units within the stock show the effects of autobrecciation and autointrusion. Some are exceptionally well-foliated and locally appear to grade into quartz-biotite-feldspar schists. These schistose rocks were apparently formed in zones of overthrusting within the stock during one or more periods of magma intrusion. Limited evidence indicates that most of the diorite-quartz diorite is older than the quartz monzonite pluton.

Sulfide-bearing quartz and quartz-carbonate veins and zones of hydrothermal alteration are relatively common in the district. Principal altered areas and veins occur within or in close proximity to the quartz monzonite border zone, especially around the southern margin of the pluton. To the

north the border zone becomes very irregular and is often absent indicating a southerly plunge to the pluton. In the altered areas the rocks have been replaced by quartz, carbonate, pyrite, and sericite. The quartz and quartz-carbonate veins generally contain variable amounts of galena, sphalerite, chalcopyrite, silver-bearing tetrahedrite, and pyrite. Locally the diorite-quartz diorite rocks contain small areas of disseminated chalcopyrite.

Two large stream sediment geochemical anomalies detected in the 1964 field season are also apparently confined to areas underlain by the quartz monzonite border zone. These anomalies exhibit metal concentrations as high as 1000 parts per million copper, +1000 ppm zinc, 500 ppm lead and 26 ppm molybdenum. No anomalies were found around the northern extension of the quartz monzonite pluton where the border zone is thin or absent. Minor copper anomalies are present in some of the streams draining the diorite-quartz diorite stock.

SODA CREEK AREA, Mentasta Mountains (14)

D. Richter, Mining Geologist
20 square miles mapped
July 5-9, 1965

Copper

Reconnaissance investigations in the Mentasta Mountains, initiated in the Rock Creek area in 1964, were continued in 1965. In the Soda Creek area northerly-dipping amygdaloidal basalt flows are conformably overlain by a thick unit of thin-bedded clastic sediments. Locally, massive brecciated limestone unconformably overlies the basalt and may possibly represent remnants of a large overthrust plate from the north.

A major northwesterly trending fault extends through the area and appears to join with the Denali structure to the northwest. The trace of the fault is marked by a strong topographic linear that can be followed from Totschunda Creek to the headwater of the Little Tok River, a distance of approximately 20 miles.

Native copper is found sparingly in the amygdaloidal basalt associated with the minerals chlorite, epidote, pumpellyite, and celadonite.

Detailed geological and geochemical studies are planned for the area between Soda Creek and Rock Creek during the 1966 field season.

Reports Released During 1965

Geologic Reports

No. 8. Geology of the Paint River Area, Iliamna Quadrangle, Alaska, by D.H. Richter & G. Herreid, January 1965. (18 pages & map).

No. 9. A Geologic and Geochemical Traverse Along the Nellie Juan River, Kenai Peninsula, Alaska, by G. Herreid, August 1965. (2 pages & map).

No. 10. Geology of the Bluff Area, Solomon Quadrangle, Seward Peninsula, Alaska, by G. Herreid, June 1965. (21 pages and large map).

No. 11. Geology of the Omilak-Otter Creek Area, Bendeleben Quadrangle, Seward Peninsula, Alaska, by G. Herreid, June 1965. (12 pages and large map).

No. 12. Geology of the Bear Creek Area, Seward Peninsula, Candle Quadrangle, Alaska, by G. Herreid, May 1965. (16 pages and map).

No. 13. Geology and Geochemical Investigations near Paxson, Northern Copper River Basin, Alaska, by A.W. Rose and R.H. Saunders, June 1965. (35 pages).

No. 14. Geology and Mineral Deposits of the Rainy Creek Area, Mt. Hayes Quadrangle, Alaska, by A.W. Rose. (51 pages and map).

No. 15. Geology and Mineralization of the Midas Mine and Sulphide Gulch Areas Near Valdez, Alaska, by A.W. Rose, March 1965. (21 pages and map).

No. 16. Geology and Mineral Deposits of Central Knight Island, Prince William Sound, Alaska, by D.H. Richter, July 1965. (37 pages and map).

Geochemical Reports

No. 2. Geochemical Investigation of the Slana District, South-central, Alaska, 1963 and 1964, by D.H. Richter, March 1965. (14 pages and map).

No. 3. A Geochemical Investigation in the Richardson Area, Big Delta Quadrangle, Alaska, by R.H. Saunders, April 1965. (11 pages and maps).

No. 4. Geochemical Investigations of Selected Areas in South-central Alaska, 1964, by M.W. Jasper, May 1965. (31 pages and map).

No. 5. A Geochemical Investigation Between Chatanika and Circle Hot Springs, Alaska, by W.M. Burand, May 1965. (11 pages, 2 maps).

Future Work

Areas in which geological and geochemical investigations are tentatively planned for the 1966 field season are as follows:

Northwestern*

Seward Peninsula Inmachuck River (1) and Sinuk River (2), follow up and completion of mapping and geochemical sampling accomplished in 1965.

Northcentral

Farewell-Big River (16): An area along a major fault zone with known mineralized zones which has never been mapped geologically.

Geochemical investigation of: Tolovana River (6), Hess Creek (5) Bear-Solo Creeks (5), Porcupine-Mastodon area (7), Mt. Fairplay area (8).

Southcentral Alaska

Mentasta Mountains (14): An area of copper mineralization adjacent to the Slana area mapped by the Division in 1963, 1964, and 1965.

Metal Creek (17): Copper and placer gold are known in this area.

Upper Chistochina River (14): Copper, cinnabar, chromite, magnetite, gold and ultrabasic rocks along the Windy Fault.

Northern Talkeetna Mountains (11): Large stained zones along a granite contact will be investigated.

Kodiak Island (21): Scheelite occurrences near a body of granite, in an area about 4 miles long.

Nellie Juan (20): An area of copper occurrences in greenstone.

Geochemical investigation of: Ressurrection Bay (19).

*Numbers in parentheses refer to locations shown on page 74.

Future Work (Continued)

Southeastern Alaska

Admiralty Island (27): A large area with numerous outcrops of gossan and some copper shows.

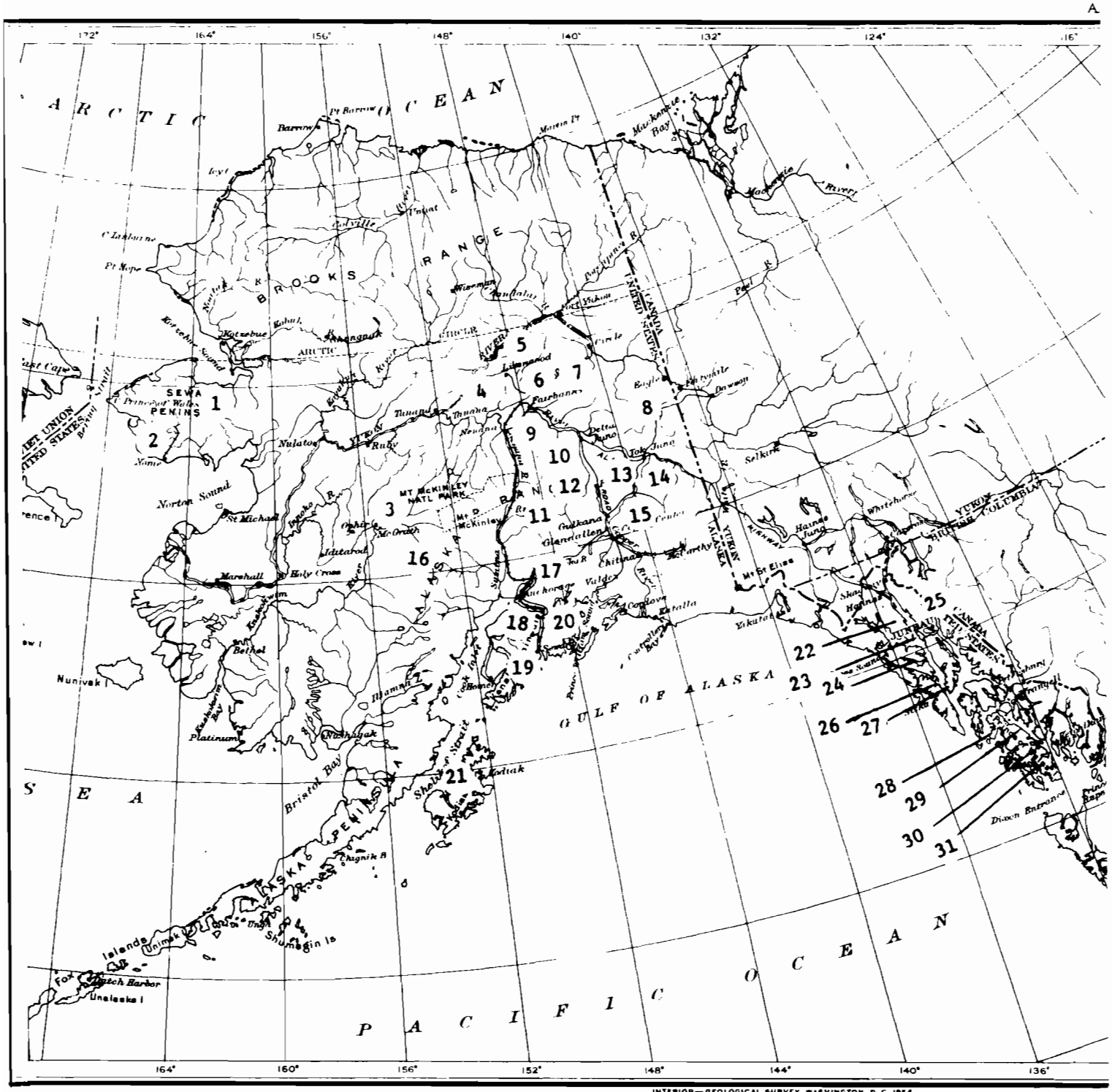
Dolomi area (31): An area of lead, zinc, copper, silver, and gold deposits just north of the Niblack Anchorage area mapped by the Division in 1963.

Dry Pass (28): An area of copper, molybdenum, and iron deposits adjacent to the Dry Pass area mapped by the Division in 1963.

Geochemical investigation of: Admiralty Island (27), Taku River (25).

Figure 13

DIVISION OF MINES AND MINERALS
Field Party Locations 1965 and 1966



INTERIOR—GEOLOGICAL SURVEY WASHINGTON D. C. 1954

ALASKA, MAI

100 0 100 200 300 400 500 Miles

100 0 100 200 300 400 500 Kilometers

BY U S GEOLOGICAL SURVEY, FEDERAL CENTER, DENVER, COLORADO OR WASHINGTON 25, D. C.

Reports to be Released Soon

The following reports on field work done in 1965 are in preparation and will be released prior to the 1966 field season. The listed descriptions under "Area" refer only to the general area covered and are not the exact titles that will be given the reports. In some cases, these reports cover continuations of work done in the same, or adjoining, areas in earlier years.

Geologic Reports

No.	Area	Author
17	Hollis and Twelvemile Arm (Ketchikan District)	Herreid & Rose
18	Eklutna	Rose
19	Mt. Hayes A-4 Quad (Paxson area)	Rose
20	Eureka & Rainy Creeks (West of Isabel Pass)	Rose
21	Slana District	Richter
22	Nixon Fork District (NW of McGrath)	Herreid
23	Hannum Creek (Seward Peninsula)	Herreid
24	Sinuk River (Seward Peninsula)	Herreid

Geochemical Reports

6	S.E. Alaska (Selected areas)	Race
7	S.C. Alaska (Selected areas)	Jasper
8	Kokomo-Fairbanks Creeks (Fairbanks District)	Saunders
9	Taylor Highway	Saunders
10	Nenana Highway	Burand
11	Elliott Highway	Burand
12	Rampart Mining District	Saunders & Burand

Prospector Assistance Program

One hundred and sixty-five requests for information on the Prospector Assistance Program were received during the year. Twenty-six applications from 25 individuals (one man submitted two proposals) were processed by the screening board of which 22 were approved. Of the 22 approved, 11 completed their programs and were reimbursed, 10 elected not to participate because of various personal reasons, and 1 applicant did not contact us after being approved. Four applications were not approved.

Gold, silver, and nickel prospects were found by this year's participants. Additional work is planned on at least three of these discoveries.

One applicant whose program was approved dropped out because he made a discovery and decided to mine it. Another decided to finance his own trip.

A drilling program was continued on a discovery made the first year of the program.

Members of the screening board were:

Robert Saunders	-	State Mining Engineer, Fairbanks
Willow Burand	-	" " " "
Martin Jasper	-	" " "" , Anchorage
William Race	-	" " " , Juneau
Dr. Donald Cook	-	College of Earth Sciences and Mineral Industry, University of Alaska
Dr. Robert Forbes	-	CESMI, University of Alaska
Leo Mark Anthony	-	" " " "
Henry Waterfield	-	" " " "

The following table presents data on this year's program.

1965 PROSPECTOR ASSISTANCE PROGRAM

NAME	LOCALITY PROSPECTED	MAN DAYS	Claims Staked	Samples Assayed	ACTUAL PROSPECTING EXPENDITURES					
					Travel	Food	Equipment & Misc.	Total Expense	Expense /Man Day	
Eddie Chipp	White Mtn.	60	10	10	$ 352.80	$ 205.53	$ 343.98	$ 902.31	$15.04	$ 676.73
Ed Farrell	Chatanika	132			280.00	113.70	1,895.00	2,288.70	17.34	1,716.53
Ed Hudson	Livengood	90	5	16	250.00	372.43	2,086.00	2,708.43	30.09	2,031.25
Julius Moor	Nabesna	68		2	305.00	243.38	577.00	1,125.38	16.55	844.04
Richard Palmer	Chatanika	53				316.88	2,096.13	2,413.01	45.53	1,809.76
Ora Schoonover	Talkeetna	31			719.00	312.45	128.07	1,159.52	37.39	869.64
Julius Sirilo	Barometer Mt.	80		1	105.00	322.09	158.66	585.74	7.32	439.31
J.A. Walper	Southeastern	99	27		2,000.00	600.00	291.77	2,891.77	29.21	2,000.00
Carl Wikstrom	Kantishna	32		13	416.00	56.64	102.03	584.67	18.27	438.50
Cliff Larsen	Kantishna	144	19	13	551.51	340.27	397.77	1,289.59	8.95	967.19
Ace Parker	Seventy Mile	60	2	1	1,023.73	155.73	393.69	1,573.15	26.22	1,114.99
	Totals	849	61	56	$6,003.08	$3,039.10	$8,480.09	$17,522.27	$20.64*	$12,907.94

An additional $750.00 is encumbered because one individual has not submitted his report.

*Average total expenditures per man for each day in the field.

EMPLOYMENT AND ACCIDENTS

	No. of Mines (1)		No. of men Employed (1)		Number of Accidents			
					1964		1965	
	1964	1965	1964	1965	Fatal	Nonfatal	Fatal	Nonfata
Placer Mines								
Dredges	10	9	136	100		8		8
Nonfloat	36	55	110	135		7		2
Hydraulic	10	11	20	21				
Coal Mines								
Underground								
Strip	3	4	190	183	1	24		22
Lode Mines								
Metal (2)	6	6	30	94		8		8
Nonmetal (3)	6	6	12	10				
Petroleum								
Production &								
Exploration			755	697		95		88
Exploration								
Metals	70	66	200	245	-	0		12
Totals	141	151	1453	1485	1	142		140

(1) Estimated
(2) Lode mines include lode, prospector and intermittent underground operatic and exploration projects, excluding sand, gravel and stone operations.
(3) Includes jade, limestone and peat.

NOTE: The above data is compiled from information collected by the Division c Mines and Minerals, the U.S. Bureau of Mines, and the Employment Security Division and Safety Division of the Alaska Department of Labor Many of the small mining operations are part time, and others accomplis little more than assessment work. This Division reports most of these small operators, whereas some of the other agencies do not because thes individuals and partnerships do not employ help. Estimated average monthly insured employment in the Alaska Mining Industry for 1965 is 1107 compared to 1137 in 1964 according to data compiled by the R&A Section, Employment Security Division, Alaska Department of Labor. Petroleum accident figures are not complete since offshore operators are required to report to the Federal government only.

LIST OF ALASKA MINING OPERATIONS ACTIVE DURING 1965

Name and Address of Operator	Location of Mine & Recording District	Approx. Crew	Type of Operation*
Admiralty Alaska Gold Mining Co., Box 2642, Juneau	Funter Bay Juneau	1	Nickel-copper lode development
Aho, John 725 2nd Ave., Fairbanks	Fortymile River Fairbanks	2	Placer preparation
Ahwinona, Jacob & Sam Nome	E. Seward Peninsula Cape Nome	2	Prospecting
Alaska Exploration & Mining Co., Talkeetna	Bird Creek Talkeetna	1	Hydraulic
Alaska Mines & Minerals, Inc. Box 422, Anchorage	Red Devil Mine Kuskokwim	1	Property leased
Alaska Nickel Co. Fred Jenkins Box 2, Eagle	Eagle Bluff Fairbanks	2	Lode development
Alaska Portland Cement Co. Ltd. 136 Kentucky Street Petaluma, California	Foggy Pass Nenana	3	Limestone exploration
Alexander, Betty Nome	Quartz Creek Cape Nome	1	Nonfloat, development work
American Agencies, Inc. 619 S. W. Clay Portland, Oregon	Kougarock River Cape Nome	3	Dredges
American Metals-Climax P. O. Box 3 Buena Vista, Colorado	Seward Peninsula Several	3	Exploration
Amero, A. W. Chandalar	E. Fork Chandalar River Fairbanks	1	Prospecting
Anderson, Ellis Chandalar	Tobin Creek Fairbanks	1	Small scale hand
Anderson, Tury & Associates Fairbanks	Fairbanks Fairbanks	1	Prospecting
Atlantic Refining Co. P. O. Box 59 Anchorage	Alaska Peninsula Iliamna	10	Exploration & claim staking
Baker, V. G. Fairbanks	Jade Mountain Noatak-Kobuk	2	Jade lode and placer

*Types of operations are explained at end of list.

Basin Creek Mining Co. Herbert Engstrom Box 554, Nome	Basin Creek Cape Nome	2	Dredge
Bear Creek Mining Co. E. 7621 Sprague Spokane, Washington	Alaska General Several	4	Exploration
Beckwith, Rea Box 119, Anchorage	Alaska General Several	1	Mineral investigations
Beshores, Paul & Associates Box 1161, Mollala, Oregon	Kugruk River Fairhaven	1	Nonfloat
Bierman, William Yakima, Washington	Slate Creek Chitina	2	Nonfloat
Bittner, Paul Central	Deadwood Creek Fairbanks	1	Hydraulic
Bliss, Patrick J. & Sons 129 E. 11th, Anchorage	Ungalik Creek Cape Nome	3	Nonfloat
Boedecker, Bill & Joines, Evert Hollis	Hollis Ketchikan	2	Prospecting
Bonanza Gold, Inc. East 15 Walton, Spokane	Prince of Wales Island Ketchikan	4	Development
Bonnell, Frank 1057 W. 80th Street Los Angeles, California	Kantishna District Fairbanks	1	Lode Prospecting
Botts, Earl & Lyle Box 1465, Fairbanks	Timberline Creek Palmer	1	Stripping and trenching
Brockway, John T. 1737 Glacier Avenue, Juneau	Baker Peak Sitka	1	Copper development
Bronson, Robert; France, Jack & Wilbur, Palmer	Old Brassel Property Palmer	2	Gold lode mining
Buck, William & Billum, Frank, Glennallen	Ahtell Creek Glennallen	8	Ag lode developmen
Burnette, Dewey & Hunter, Martha, Box 1995, Fairbanks	Crooked Creek Fairbanks	2	Nonfloat
Canyon Creek Mining Co. Jens Kvamme & Sons Akiak	Canyon Creek Kuskokwim	4	Hydraulic
Casanoff, Jack Kiana	Klery Creek Noatak-Kobuk	1	Small scale hand
Casto, Steve 33 Mile, Haines	Porcupine Creek Haines	1	Small scale hand

Chambers, Wayne California	Bluff Nome	3	Dredge
Coffield, Lawrence Usibelli	Black Creek Talkeetna	1	Gold lode prospecting
Coleman, George Palmer	Independence Mine Talkeetna	1	Caretaking & maintenance
College Road Peat Kushman Brothers 12 Timberland Dr., Fairbanks	College Road Fairbanks	2	Peat
Consolidated Wrangell Mining Corp. 712 Logan Bldg., Seattle	McCarthy McCarthy	6	Surface Copper mining
Cook General Delivery, Fairbanks	70 Mile Creek Fairbanks	1	Prospecting
Cordero Mining Co. 131 University Avenue Palo Alto, California	White Mountain Kuskokwim	1	Property leased
Davis, Bon Box 45, Nome	Gold Run Cape Nome	1	Nonfloat
Davis Mining Co. Bill Davis 2919 N. 36 Street Phoenix, Arizona	Alaska Peninsula Aleutian Islands	20	Prospecting & claim staking
Davis Mines, Inc. Talbert E. Davis 1511 Mary Ann, Fairbanks	Shovel Creek Noatak-Kobuk	2	Nonfloat
Dayo, Stanley Manley Hot Springs	Kuney Creek Manley Hot Springs	1	Nonfloat
Degnan, Joseph A. Ophir	Mastodon Creek Mt. McKinley	2	Nonfloat
Delong, Ralph Nome	Coffee Creek Cape Nome	1	Hydraulic
Dome Exploration, Ltd. 702-360 Bay Street Toronto 1, Ontario	Alaska General Several	14	Drilling copper prospect & lode prospecting
Dickman, O. J. Teller	Gold Run Creek Cape Nome	4	Hydraulic
Eckers, Theron Kasaan	Kasaan Peninsula Ketchikan	2	Prospecting
Edgecumbe Exploration Co. C. T. & G. H. Morgan Box 758, Sitka	Silver Bay Sitka	2	Gold lode maintenance

Edwards, Herk & Miller, Vern Nome	Nome area Cape Nome	2	Prospecting
Emerick, Rollie; Brakefield, Erwin; Monroe, C.; Greathouse, C. R., Delta Junction	Alaska General Several	3	Prospecting
Empire Jade Co., Gene Joiner Kotzebue	Jade Creek Noatak-Kobuk	1	Jade recovery & cutting
Falconbridge Nickel Mines, Ltd. 504-1112 W. Pender Street Vancouver 1, B. C.	Kasna Creek Iliamna	8	Drilling copper loc
Farland, Gene Nome	Koyana Creek Cape Nome	1	Offshore prospectir
Ferguson, Archie & Belobraidich, John, Kotzebue	Candle Creek Fairhaven	6	Nonfloat
Fern Gold Mining Co. 502 Columbia Building Spokane, Washington	Willow Creek Palmer	1	Gold lode
Flat Creek Placers Fullerton Brothers Flat	Flat & Willow Creeks Mt. McKinley	3	Nonfloat
Foreman, Kenneth C.	Hollis Ketchikan	1	Development & drilling
Foster, Neal W. Box 279, Nome	Seward Peninsula Several	1	Lode prospecting
Foster, Neal W. Box 279, Nome	Hannum Creek Fairhaven	2	Nonfloat
Ghezzi, Alfred R. Box 1857, Fairbanks	3rd & 4th Districts Several	1	Prospecting
Gilbertson, George 314 Charles Street Fairbanks	Canyon Creek Fairbanks	2	Nonfloat
Glass & Heifner Jamestown, Ohio	Beauty Bay Seward	8	Mill construction
Gold Cord Mining Co. 2309 Lord Baranof Blvd. Anchorage	Fishhook Creek Palmer	2	Gold Lode develop-ment
Goodnews Bay Mining Co. 422 White Building, Seattle, or Platinum	Salmon R. & tribs. Bethel	40	Platinum dredge
Hancock, K. S. Haines	Porcupine Creek Haines	1	Small scale hand

Hansen, Burnett F. Eagle	Ben Creek Fairbanks	2	Nonfloat
Hanson, Aage 1108 10th Avenue N. Seattle, Washington	Craigie Creek Talkeetna	1	Gold lode development
Hassel Mining Co. Harold Hassel Box 1071, Fairbanks	Ready Bullion Creek Fairbanks	2	Nonfloat
Havrilack, Harry Rampart	Ruby Creek Rampart	1	Nonfloat
Hawkins, W. A.; Eichner, Ken; Lillie, Angus, Ketchikan	Southeastern Alaska Several	1	Prospecting
Heiner, Larry Petersburg	Southeastern Alaska Several	1	Prospecting
Henton, Fred Mile 42, Seward Highway	Slate Creek Seward	1	Gold lode development
Herning, Harold Box 1792, Fairbanks	Candle Fairhaven	2	Nonfloat
Hersch & Herning, Harold Candle	Mud Creek Fairhaven	2	Nonfloat
Hill, Lloyd Star Route, Palmer	Grubstake Gulch Palmer	1	Soapstone mining
Holovics, Louis Manley Hot Springs	American Creek Manley Hot Springs	1	Hydraulic
Hogendorn, Jack Deering	Inmachuck River Fairhaven	1	Hydraulic
Holloway, Dorr Red Devil	Kolmakof Property Kuskokwim	2	Mercury lode stripping
Huff, J. W. Box 837, Ward Cove	Groundhog Basin Wrangell	5	Prospecting
Hunter Creek Mining Co. Melo Jackovich 803 Pioneer Road, Fairbanks	Hunter Creek Rampart	2	Nonfloat
Idaho Bar Mining Co. Kosta Melnikoff Rampart	Idaho Bar Rampart	1	Nonfloat
Johnson, Iver M. Fairbanks	Chisana District Fairbanks	2	Nonfloat
Kawolsky, Ignacey Nome	Charley Creek Cape Nome	1	Prospecting

Kelliher, Maurice Nome	Kougarok River Cape Nome	1	Prospecting
Kennecott Copper Corp. New Mines Division Keams Building Salt Lake City, Utah	Ruby Creek Noatak-Kobuk	75	Copper lode develo ment
Keystone Mines, Inc. Box 630, Fairbanks	Wolf Creek Fairbanks	6	Gold lode
Kloss, Herman (K & D Lode) Sunset Cove	Sunset Cove Juneau	1	Gold-antimony lode development and prospecting
Knorr, Vincent Bettles Field	Mascot Creek Koyukuk	2	Nonfloat
Langlow, Jens Central	Switch Creek Fairbanks	1	Hydraulic
Lanning, Tony Manley Hot Springs	Eureka Creek Manley Hot Springs	1	Nonfloat
Lee Brothers Dredging Co. Box 208, Nome	Cape Creek Cape Nome	5	Tin development
Leonard, Harry B. A.C.Mining Co., Wiseman	Vermont Creek Fairbanks	1	Small scale hand
Leslie, Robert Box 1838, Fairbanks	Rampart District	1	Prospecting
Lie, Harold Kotzebue	Bear Creek Cape Nome	1	Prospecting
Lindquist, Hjalmer 133 N. Marion, Bremerton, Washington, or Ophir	Beaver Rock & Ester Creeks McGrath	1	Nonfloat
Little Creek Mine Ivor C. Carlson, Ophir	Ophir McGrath	2	Nonfloat
Little Squaw Mining Co. 309 Radio Central Building Spokane, Washington	Chandalar District Fairbanks	2	Gold lode development
Locke, Barney Wasilla	Sheep Mt. & Soda Creek Anchorage & Nabesna Quads	1	Copper prospects
Lucky Seven Mining Co. Walter E. Roman Box 141, Fairbanks	Fish Creek Fairbanks	3	Nonfloat
Lyman, Robert Lyman Mining Co., Red Devil	White Mountain Kuskokwim	4	Cinnabar productio
McClure, Francis Schaefer; Schaefer, Norman 62 Copeland Avenue La Crosse, Wisconsin	Cinnabar Creek Kuskokwim	2	Mercury lode exploration

McCombe, R. S. Chicken	Lost Chicken Creek Fairbanks	1	Prospecting
Marvel Creek Mining Co. Awe, Charles Aniak	Marvel Creek Bethel	3	Nonfloat
Meldrum, William Chicken	Stonehouse & Chicken Creeks Fairbanks	2	Nonfloat
Mendenhal, Ray & Evans, W. H. Box 811 Nome	Milroy Creek Fairhaven	2	Nonfloat
Miller, James; Lindgrin, Earl; Atwood, M. J.	Koyukuk Dist. Fairbanks	3	Prospecting
Minalaska, Inc. Magnuson Brothers, Ophir	Gaines Creek Mt. McKinley	3	Dredge
Mineral Basin Mining Corp. Moa, Arthur, Box 126 Hyder	Mt. View Property Ketchikan	2	Exploration (lode)
Miscovich Brothers Otter Dredging Co. Flat	Otter Creek Mt. McKinley	4	Dredge
Monroe, Gilbert & Jones, Francis Box 46, Glennallen	Boulder Creek Manley Hot Springs	1	Placer development
Monte Cristo Mining Co. R. W. Beck, Gakona	Slate Creek Chitina	5	Nonfloat
Morgan, Milton F. & Novak, M. J. Auric Offshore Mining Co. 5115 El Cajon Blvd. San Diego, California	Bluff Cape Nome	4	Prospecting off-shore
Mrak, William Sutton	Grubstake Gulch Palmer	3	Nonfloat
Mt. Andrew Mining Co. Box 358, Ketchikan or 1011-1030 W. Georgia Street Vancouver 5, B. C.	Kasaan Peninsula Ketchikan	1	Iron & copper exploration
Mt. Parker Mining Co. A. F. Parker Box 2127, Juneau	Mt. Parker Mine Juneau	1	Gold lode maintenance
Nesland, Erling & Associates 2027 Airport Road, Fairbanks	Tramway Bar Fairbanks	2	Nonfloat
Newlun, O. H. Box 623, Ketchikan	Prince of Wales Island Ketchikan	1	Prospecting

North American Dredge Co. John Stevens, Flat	Flat Creek Mt. McKinley	3	Dredge
Northland Mines Charles W. Monroe Box 876, Delta Junction	Watana Creek Talkeetna	3	Prospecting
Novak, John 1780 Ocean Blvd. Coos Bay, Oregon	Bering Sea & Others Cape Nome	2	Offshore prospecti
Nugget Mining Co. Box 685, Nome	Niukluk River Cape Nome	4	Dredging
Olive Creek Mines Carl Parker, Box 552 Fairbanks	Amy & Olive Creeks Fairbanks	3	Nonfloat
Olson, Henry T. "Tiger" Taku Harbor	Juneau & Admiralty Districts	1	Prospecting
Ocean Mining A. G. Ocean Science Bldg., Washington, D. C.	Bering Sea	6	Offshore prospect- ing
O'Neill Ventures William O'Neill 505 8th Ave., Anchorage	Dan Creek McCarthy	2	Devlopment work
Pade, Otto Skagway	Skagway Skagway	1	Prospecting
Palmer, R. B. Box 1617, Fairbanks	Sourdough Creek Fairbanks	1	Prospecting
Pan American Petroleum Corp. P. O. Box 591 Tulsa, Oklahoma	Alaska Peninsula Iliamna	60	Exploration & claim staking
Pankratz, Fred; Doyle, Al Nome	Bering Sea & Beaches Cape Nome	4	Beach & Offshore prospecting
Pannick, Harry General Delivery, Fairbanks	Flume Creek Fairbanks	1	Nonfloat
Parker, Fred	Inmachuck River Fairhaven	3	Nonfloat
Pederson, Steve Box 685, Nome	Niukluk River Cape Nome	2	Dredge
Permanente Cement Co. Oakland, California	Kings River Palmer	2	Limestone explora- tion
Pieper, Paul Ketchikan	Kasaan Ketchikan	1	Prospecting
Pittman, Ray 1701 Stanton Avenue Anchorage	Alameda Creek Manley Hot Springs	1	Nonfloat

Pratt, Jack; Dube, Tony Suntrana	No Grub Creek Fairbanks	2	Nonfloat
Price, Stanton c/o Dean Goodwin Box 1262, Juneau	Windfall Harbor Juneau	1	Prospecting
Prince Creek Mining Co. Agoff, S. E. Flat	Prince Creek Mt. McKinley	4	Nonfloat
Purkeypile, I. W. & Associates 320 3rd St. Hamilton Acres Fairbanks	Tonzona District Mt. McKinley	3	Lode prospecting
Quitsch, William Valdez	Mineral Creek Valdez	1	Gold lode prospecting
Radovan, Martin McCarthy	Glacier Creek McCarthy	4	Copper lode prospecting
Redstone Mining Co. Carl Heflinger 409 Clara Street, Fairbanks	Livengood Creek Fairbanks	4	Nonfloat
Reed, Curtiss & Rybachek, Stanley; Radak, John Livengood	Wilbur Creek Fairbanks	2	Hydraulic
Renshaw, A. L. & Associates 2309 Lord Baranof Blvd. Anchorage	Alaska Peninsula Iliamna	2	Exploration
Rhode Island Creek Mines A. W. Pringle Manley Hot Springs	Rhode Island Creek Manley Hot Springs	3	Nonfloat
R. S. Richards & Associates Box 1817 Anchorage	N. Fork Kashwitna River & Alaska Peninsula area Several	5	Copper, iron, gold
Ricks, Dean Fairbanks	Fairbanks District Fairbanks	1	Prospecting
Robinson, George F. Chicken	Wade Creek Fairbanks	1	Nonfloat
Rosander & Gates Ophir	Bear Creek Mt. McKinley	3	Nonfloat
Rosander & Reed Ophir	Yankee Creek Mt. McKinley	4	Nonfloat
Ruby Mining Co. Asher B. Richardson 326 Boundry St., Fairbanks	Long Creek Nulato	2	Nonfloat

Shapely, George Craig	Tuxekan Island Ketchikan	1	Prospecting
Sheldon, Charlie Shungnak	Shungnak River Noatak-Kobuk	1	Jade placer
Shell Oil Co. Shell Bldg., 100 Bush St., San Francisco, California	Bering Sea Cape Nome	5	Offshore prospecti
Sherman, Mike Candle	Patterson Creek Fairhaven	1	Nonfloat
Sinclair Oil Co. Box 584, Anchorage	Alaska General Several	6	Prospecting
Silver Ridge Mining Co. Ltd. Box 540, Nelson, B. C.	Eagle Creek Fairbanks	4	Antimony lode exploration
Sirilo, Julius Box 625, Bethel	Aniak District Kuskokwim	1	Prospecting
Slate Creek Mining Co., DuRand, Edward H. Box 1564, Fairbanks	Slate Creek Fairbanks	1	Nonfloat
Smith, Pete & Associates Box 1660, Fairbanks	Steamboat Creek Fairbanks	2	Prospecting
Squaw Creek Mining Co. Wilke, Jack Chicken	Canyon Creek Fairbanks	1	Nonfloat
St. Amand, Loren Box 387, Valdez	Midas Mine Valdez	1	Development
Standard Metals Corp. Box 1081, Ketchikan	Kendrick Bay Ketchikan	1	Development
Steears, Al Box 826, Ketchikan	Southeastern Alaska Several	1	Prospecting
Stelting, H. W. Box 19, Haines	Haines Haines	1	Prospecting
Strandberg Mines, Inc. Box 2099, Anchorage	Eureka Creek Manley Hot Springs	3	Nonfloat
Stuver, Jules Flat	Moore Creek Mt. McKinley	2	Hydraulic
Sweepstakes Mine Charles Moon & Baldwin Box 371, Nome	Sweepstakes Creek Cape Nome	1	Nonfloat
T and T Mining Co. William Thomas Box 1464, Fairbanks, or Rampart	Hunter Creek Rampart	1	Stripping

Taylor, Arley & Associates c/o Snitely Bros. Wenatchee, Washington	Eureka Creek Fairbanks	2	Nonfloat
Tetinek, Eugene Fortuna Ledge	Willow Creek Wade Hampton	1	Nonfloat
Titus, Jack; Cook, Fred Solomon	Shovel Creek Cape Nome	2	Small scale hand
Totem Exploration Co. Joe Blazek 317 Dock Street Ketchikan	Southeastern Alaska Several	1	Prospecting
Tweet, N. B. & Sons Teller	Kougarok River Cape Nome	6	Nonfloat, hydraulic
Uotila, Gus Ophir	Birch Creek Nulato	1	Stripping
U.S.S.R. & M. Co. Box 438, Nome	Nome District Cape Nome	4	Prospecting
U.S.S.R. & M. Co. Box 1170, Fairbanks	Hogatza River Ft. Gibbon	34	Gold dredge
U.S.S.R. &. M. Co. Box 1170, Fairbanks	Mosquito Fork Fairbanks	15	Dredge
U. S. Steel Corp.	Alaska General Several	8	Development
Valdez Mines Ltd. W. Fillipek, President 10032 105th Street Edmonton, Alberta	Canyon Creek Chitina	14	Nickel-copper-prospecting
Wackwitz, Charles & Fred Box 1595, Fairbanks	Bedrock Creek Fairbanks	2	Prospecting
Wall, Melvin Box 3256, Spenard	Valdez Creek Palmer	2	Placer development
Walsh, Pearse Nome	Mt. Distin Cape Nome	1	Prospecting
Watson, Mrs. Ben Cape Yakataga	Yakataga Beach Cordova	2	Small scale hand
Weber, Glen Miller House	Porcupine Creek Fairbanks	3	Placer development
Weinard, Fred Candle	Mud Creek Fairhaven	2	Nonfloat
Weisner Trading Co. Ira Weisner Rampart	Little Minook & Hoosier Creeks Rampart	2	Development

Weston, David Fairbanks	Dome Creek Fairbanks	1	Nonfloat
Wheeler, Vernon & Associates Box 14A, Wasilla	Grubstake Gulch Palmer	2	Gold lode development
Williams, Burton A. May Creek via Cordova	Rex Gulch McCarthy	1	Small scale hand
Willis, George Alice & Bessie Mine Red Devil	Parks Property Kuskokwim	1	Small mercury operation
Withrow, Alfred W. Bettles Field	Koyukuk River Fairbanks	1	Small scale hand
Wiurm, Andrew Box 491, Nome	Dome Creek Cape Nome	1	Hydraulic
Woodman, I. N. Box 573, Valdez	Tonsina Lake area Valdez	1	Prospecting
Worthington, John	Prince of Wales Island Ketchikan	1	Prospecting
Zaiser, Clarence Ruby	Greenstone Creek Nulato	2	Nonfloat
Zimin, Nick South Naknek	Alaska Peninsula & Bristol Bay District	1	Prospecting
Zukoev, James	Bonnifield District Nenana	1	Nonfloat

"Nonfloat" indicates mechanical placer gold operation using draglines and/or bulldozers to transport gravel to nonfloating washing plant, bedrock sluiceboxes, or elevated sluices.

"Hydraulic" indicates placer gold operation in which gravel is excavated and transported to sluiceboxes solely by water jets from hydraulic nozzles.

"Small scale hand" indicates placer gold operation in which gravel excavation and transportation is accomplished by hand or ground sluicing.

ACTIVE COAL MINES, 1965

Name and Address of Operator	Location of Mines & Coal Field	Type of Operation	Approx. Crew*
Alaska Matanuska Coal Co. (Paul Omlin) Box 13, Palmer	Premier Mine Matanuska Field	Strip	3
Evan Jones Coal Co. Box 619, Anchorage or Jonesville	Jonesville Matanuska Field	Strip	88
Usibelli Coal Mines, Inc. Usibelli	Healy Creek Nenana Field	Strip	53
Vitro Minerals Corp. Box 1070, Fairbanks	Healy Creek Nenana Field	Strip	39
Walper, James [redacted] Spadina Road Toronto, Ontario	Southeastern [redacted]		4

Note: Above data from DM&M records.

* Size of crew is the average for the year through October

ACTIVE PETROLEUM COMPANIES

Oil and gas companies active in Alaskan production, drilling, and geological and geophysical crew activities. This list does not include the many organizations involved in leasing activity only. The address given for each company is the best address at which to contact that company.

American Petrofina Expl. Co.
Room B-410 Broadway Bldg.
Denver U.S. National Center
Denver, Colorado 80202

Atlantic Refining Company
P.O. Box 59
Anchorage, Alaska 99501

Apache Corporation
823 South Detroit
Tulsa, Oklahoma

British American Oil Producing Co.
Box 180
Denver, Colorado 80201

B P. Exploration U.S.A. Inc.
326 I Street
Anchorage, Alaska 99501

Colorado Oil & Gas Corp.
Box 749
Denver, Colorado

Continental Oil Company
Continental Oil Bldg.
1755 Glenarm Place
Denver, Colorado 80202

Great Basins Petroleum Company
1911 Gateway West
Los Angeles, California 90067

Humble Oil & Refining Company
Box 440
Anchorage Alaska 99501

Hunt Oil Company
700 Mercantile Bank Bldg.
Dallas, Texas

Marathon Oil Company
645 G Street
Anchorage, Alaska 99501

Mobil Oil Company
Box 1734
Anchorage, Alaska 99501

Pan American Petroleum Corp.
Box 779
Anchorage , Alaska 99501

Phillips Petroleum Corp.
Box 419
Anchorage, Alaska 99501

Richfield Oil Corporation
Box 2241
Ancnorage, Alaska 99501

Shell Oil Company
Room 201, NBA Building
Anchorage, Alaska 99501

Sinclair Oil & Gas Company
501 Lincoln Tower Building
Denver, Colorado 80203

Skelly Oil Company
Box 1314
Anchorage, Alaska 99501

Standard Oil Company of California
Box 7-839
Anchorage, Alaska 99501

Sun Oil Company
1608 Walnut Street
Philadelphia, Pennsylvania 19103

Sunray DX Oil Company
Box 2039
Tulsa, Oklahoma

Superior Oil Company
Box 200
Casper, Wyoming

Tenneco Oil Company
Box 2511
Houston, Texas

Texaco, Inc.
Box 664
Anchorage, Alaska 99501

Union Oil Company of California
2805 Denali Street
Anchorage, Alaska 99501

LIST OF REPORTS ISSUED BY THE DIVISION OF MINES AND MINERALS AND CORRESPONDING PRECEDING AGENCIES

*Report of the Mine Inspector for the Territory of Alaska to the Secretary of the Interior, fiscal year ended June 30, 1912.

*Report of the Mine Inspector for the Territory of Alaska to the Secretary of the Interior, fiscal year ended June 30, 1913.

*Report of the Mine Inspector for the Territory of Alaska to the Secretary of the Interior, fiscal year ended June 30, 1914.

*Report of the Territorial Mine Inspector to the Governor of Alaska for the year 1915.

*Report of William Maloney, Territorial Mine Inspector, to the Governor of Alaska for the year 1916.

*Report of the Territorial Mine Inspector to the Governor of Alaska for the year 1917.

*Annual Report of the Territorial Mine Inspector to the Governor of Alaska, 1920.

*Annual Report of the Territorial Mine Inspector to the Governor of Alaska, 1921.

*Annual Report of the Mine Inspector to the Governor of Alaska, 1922.

*Annual Report of the Mine Inspector to the Governor of Alaska, 1923.

*Report upon Industrial Accidents Compensation and Insurance in Alaska for the biennium ending December 31, 1924.

*Report of the Territorial Mine Inspector, calendar years 1925-26.

*Report of cooperation between the Territory of Alaska and the United States in making mining investigations and in the inspection of mines for the biennium ending March 31, 1929.

*Report of cooperation between the Territory of Alaska and the United States in making mining investigations and in the inspection of mines for the biennium ending March 31, 1931.

*Mining Investigations and Mine Inspection in Alaska, biennium ending March 31, 1933.

*Report of the Commissioner of Mines to the Governor, biennium ending December 31, 1936.

*Report of the Commissioner of Mines to the Governor, biennium ending December 31, 1938.

*Report of the Commissioner of Mines to the Governor, biennium ending December 31, 1940.

*Report of the Commissioner of Mines to the Governor, two biennia ended December 31, 1944.

*Report of the Commissioner of Mines, biennium ended December 31, 1946.

*Report of the Commissioner of Mines, biennium ended December 31, 1948.

*Report of the Commissioner of Mines, biennium ended December 31, 1950.

*Report of the Commissioner of Mines, biennium ended December 31, 1952.

*Report of the Commissioner of Mines, biennium ended December 31, 1954.

*Report of the Commissioner of Mines, biennium ended December 31, 1956.

*Report of the Commissioner of Mines, biennium ended December 31, 1958.

*Report of the Division of Mines and Minerals for the year 1959.

Report of the Division of Mines and Minerals for the year 1960.

*Report of the Division of Mines and Minerals for the year 1961.

*Report of the Division of Mines and Minerals for the year 1962.

Report of the Division of Mines and Minerals for the year 1963.

Report of the Division of Mines and Minerals for the year 1964.

*Joesting, Henry R., Strategic Mineral Occurrences in Interior Alaska, Pamphlet No. 1, May 1942.

*Joesting, Henry R., Supplemental to Pamphlet No. 1 - Strategic Mineral Occurrences in Interior Alaska; Pamphlet No. 2, March 1943.

*Anderson, Eskil, Mineral Occurrences other than Gold Deposits in Northwestern Alaska: Pamphlet No. 5-R, May 1944.

*Stewart R.L., Prospecting in Alaska (26-page pamphlet) December 1944. (Revised to November 1949).

*Glover, A.E. Industrial Minerals as a Field for Prospecting in Alaska including A Glossary of Elements and Minerals (82-page booklet) March 1945. (Revised to May 1946).

*Anderson, Eskil, Asbestos and Jade Occurrences in the Kobuk River Region, Alaska: Pamphlet No. 3-R, May 1945.

*Roehm, J.C., Some High Calcium Limestone Deposits in Southeastern Alaska: Pamphlet No. 6, March 1946. Mimeographed copies are available.

Information Circular #1: Proper Claim Staking in Alaska, Revised June 14, 1965.

Information Circular #2: Rights of Canadians in Alaska under the Mining Laws, September 15, 1953.

Information Circular #3: Hand Placer Mining Methods, April 16, 1962.

*Information Circular #4: Alaska Uranium Information, March 15, 1965

Information Circular #5: General Alaskan Mineral Information; Revised April 30, 1965.

Information Circular #6: Alaskan Prospecting Information; Revised May 25, 1965.

*Information Circular #7: Compulsory Assessment Work Affidavits, July 15, 1957.

Information Circular #8: Mineral Industry Consultants Available for Work in Alaska, December 18, 1964.

Information Circular #9: Dealers in Alaskan Rocks and Minerals; Revised July 23, 1965.

Information Circular #10: Skin Diving for Gold in Alaska, November 5, 1964.

Information Circular #11: List of Division of Mines and Minerals publications Revised September 7, 1965.

Information Circular #12: Services of the Division of Mines and Minerals, November 20, 1964.

Information Circular #13: Dangers in Old Mine Openings, November 6, 1962.

Information Circular #14: Mining Laws Applicable in Alaska; Revised June 21, 1965.

Race, William H., The Mineral Industry of the Kenai-Cook Inlet-Susitna Regions, 1962.

*Report No. PE 85-22; Report on Preliminary Investigation of the Kings River Area Limestone Deposits, Anchorage Quadrangle, by Martin W. Jasper and Miro Mihelich, State Mining Engineers, January 1961.

Report No. PE 65-1; Report on the Mespelt Mine of Strandberg Mines, Inc., Nixon Fork District Medfra Quadrangle, Alaska, by Martin W. Jasper State Mining Engineer, February 1961.

Alaska's New Mining Law for State Lands, by James A. Williams, Director, State Division of Mines and Minerals, December 1961 (Reprinted from Mining Engineering Magazine).

Geology and Ore Deposits of Alaska, by Gordon Herreid, Geologist, State Division of Mines and Minerals, December 1961 (Reprinted from Mining Engineering Magazine).

Tectonics and Ore Deposits in Alaska, by Gordon Herreid, Mining Geologist, State Division of Mines and Minerals, Presented at the 1964 Alaska AIME Conference, College, Alaska, March 19, 1964.

A Possible Guide to Metal Deposits of Alaska, by Charles F. Herbert, Deputy Commissioner, State Department of Natural Resources. Presented at the 1964 Alaska AIME Conference, College, Alaska, March 20, 1964.

Map: Better-Known Mineral Deposits Possible Petroleum Provinces, and Existing Roads.

Map: M.I. Report No. 194-1; A Preliminary Map of the Bedrock Geology of the Fairbanks Mining District, Alaska, by Robert B. Forbes and Jim M. Brown, Department of Geology, College of Earth Sciences and Mineral Industry, University of Alaska for the Division of Mines and Minerals, December 1961. Price: $1.00.

Geologic Report #1: Preliminary Report on Geologic Mapping in the Coast Range Mineral Belt, by Gordon Herreid. This report formerly included in Annual Report of the Division of Mines and Minerals for the year 1962 but supply exhausted. Now available in reprint form. Price $1.00.

*Geologic Report #2: Bedrock Geology of the Rainbow Mountain Area, Alaska Range, Alaska; an M.S. thesis prepared by Larry G. Hanson of the University of Alaska in cooperation with the Division of Mines and Minerals November 1963.

Geologic Report #3: Geology of the Portage Creek-Susitna River Area, by Donald Richter,1963. (2 large sheets). Price $1.00.

Geologic Report #4: Geology and Mineral Deposits of the Denali-Maclaren River Area, Alaska, by M.A. Kaufman, May 1964. (19 pages & large map). Price $1.00.

Geologic Report #5: Geology of the Niblack Anchorage Area, Southeastern Alaska, by Gordon Herreid, May 1964. (10 pages & large map). Price $1.00.

Geologic Report #6: Geology and Mineral Deposits of the Ahtell Creek Area, Slana District, Southcentral Alaska, by Donald H. Richter, May 1964. (17 pages & large map). Price $1.00.

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Geologic Report #7: Geology of the Dry Pass Area Southeastern Alaska by Gordon Herreid and M.A. Kaufman, June 1964. (16 pages) Price $1.00.

Geologic Report #8: Geology of the Paint River Area Iliamna Quadrangle, Alaska, by D.H. Richter & G. Herreid, January 1965. (pages & Map). Price $1.00.

Geologic Report #9: A Geologic and Geochemical Traverse Along the Nellie Juan River, Kenai Peninsula, Alaska, by G. Herreid, August, 1965. No Charge. (2 pages & Map).

Geologic Report #10: Geology of the Bluff Area, Solomon Quadrangle, Seward Peninsula, Alaska, by G. Herreid, June 1965. (21 pages & large map). Price $1.00.

Geologic Report #11: Geology of the Omilak-Otter Creek Area, Bendeleben Quadrangle, Seward Peninsula, Alaska, by G. Herreid, June 1965. (12 pages and large map). Price $1.00.

Geologic Report #12: Geology of the Bear Creek Area, Seward Peninsula, Candle Quadrangle, Alaska, by G. Herreid, May 1965. (16 pages & map). Price $1.00.

Geologic Report #13: Geology and Geochemical Investigations Near Paxson, Northern Copper River Basin, Alaska, by A.W. Rose and R.H. Saunders, June 1965. (35 pages). Price $1.00.

Geologic Report #14: Geology and Mineral Deposits of the Rainy Creek Area, Mt. Hayes Quadrangle, Alaska, by A.W. Rose. (51 pages & map). Price $1.00.

Geologic Report #15: Geology and Mineralization of the Midas Mine and Sulphide Gulch Areas Near Valdez, Alaska, by A.W. Rose, March 1965. (21 pages & map). Price $1.00.

Geologic Report #16: Geology and Mineral Deposits of Central Knight Island, Prince William Sound, Alaska, by D.H. Richter, July 1965. Price $1.00.

*Geochemical Report #1: Geochemical Investigations of Selected Areas in Southeastern Alaska, by C.F. Herbert and W.H. Race, November 1964. Out of Print. Has been included with 1965 work in Geochemical Report #6 covering both years.

Geochemical Report #2: Geochemical Investigation of the Slana District, Southcentral, Alaska, 1963 and 1964, by D.H. Richter, March 1965. (14 pages and map). Price $1.00.

Geochemical Report #3: A Geochemical Investigation in the Richardson Area, Big Delta Quadrangle, Alaska, by R.H. Saunders, April 1965. (11 pages and maps). Price $1.00.

Geochemical Report #4: Geochemical Investigations of Selected Areas in Southcentral Alaska, 1964, by M.W. Jasper, May 1965. (31 pages & map). Price $1.00.

Geochemical Report #5: A Geochemical Investigation Between Chatanika and Circle Hot Springs, Alaska, by W.M. Burand, May 1965. (11 pages, 2 plates). Price $1.00.

Geochemical Report #6: Geochemical Investigations of Selected Areas in Southeastern Alaska, 1964 and 1965, by C.F. Herbert and W.H. Race. December 1965. (66 pages and 16 maps). $1.00.

The Great Alaska Earthquake, March 27, 1964: May 19, 1964.

Mine Safety Regulations, 1963, from the Alaska Administrative Code.

Oil and Gas Conservation Regulations and Statute, 1964, from the Alaska Administrative Code, and Alaska Statutes.

*Out of Print. On file in certain public and university libraries.