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College, Alaska 99708

Jay S. Hammond—Governor

Robert E. LeResche—Commissioner
Geoffrey Haynes—Deputy Commissioner

Ross G. Schaff—State Geologist

230 So. Franklin (Rm. 407)
Juneau, Alaska 99801*

941 Dowling Rd
Anchorage, Alaska 99502*

3001 Porcupine Drive
Anchorage, Alaska 99501

P.O. Box 80007
College, Alaska 99708*

P.O. Box 7438
Ketchikan, Alaska 99901*

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DGGS seeks geologic-hazards information

DGGS is soliciting input for an information circular on geologic hazards. The circular will list names and addresses of individuals and government agencies that can provide information and advice on the identification and mitigation of natural geologic hazards. The potential hazards that can occur in Alaska will also be listed.

Any organizations or private consultants wishing to be included in this circular should contact J.T. Kline of the College office. Some of the types of geologic hazards known to occur in Alaska are:

- **Flooding** (high precipitation rates; rapid snow melts; ice jams; damming and subsequent outburst due to slides, mudflows, and glaciers; glacier outbursts (jokuhlaups); ice formation in road culverts).
- **Mass-movement phenomena** (landslides; debris flows; debris

avalanches; mudflows; rock-falls; soil creep; solifluction; snow avalanche; slush-flow avalanche; slide-induced waves).

- **Glacier-related hazards** (calving and icebergs; surges; outburst; aggradation of streams).
- **Other ice-related hazards** (aufeis formation; road and slope icings; on-shore encroachment of pack ice; lake-ice impact and shove; well icings).
- **Ground ice (active-layer phenomena)** (frost heaving and jacking; frost boils; tensional cracking).
- **Ground ice (permafrost)** (thermokarst formation; thaw lake formation; thermal degradation from construction).
- **Volcanic hazards** (ash falls; glowing tephra avalanches; lahars; base surges; lava flows; flash flooding; ash in machinery; seiche generation; acid rain; rapid stream-bed aggradation)

- **Seismic hazards** (ground shaking and cracking; cohesive failure in subsurface; tsunami generation; slope and building failure).
- **Fluvial hazards** (bank erosion; rapid aggradation).
- **Marine coastal hazards** (storm surge; coastal erosion; man-caused erosion; saltwater invasion of low-lying areas).
- **Submarine hazards** (earthquake-induced submarine slumps; turbidity currents; scour by bottom currents, drifting sea ice; ice-pressure ridges and sand ridge migration; high velocity effects of geostrophic and tidal currents; gas-charged bottom sediments).
- **Hazards related to ground water** (ground-water depletion; chemicals; settlement due to interstitial collapse following excessive pumping of reservoirs; artesian flooding and effects on permafrost; saltwater incursion).
- **Soils hazards** (compaction settling; expanding clays; thixotropic soils; erosion by wind, gullying, and sheetwash).
- **Eolian hazards** (deflation, deposition, dune migration, sandblasting).

DGGS 5-year resource evaluation and mapping approved

A 5-year resource evaluation and mapping program was approved by the Governor and awaits legislative concurrence. Under the Capital Improvements Program (CIP) form of funding, the package will allow the initiation of systematic geologic mapping and evaluation of the State's resources.

Nine general regions were selected on the basis of anticipated information needs: Seward Peninsula, upper Kuskokwim, Matanuska Valley-Chugach Mountains-Copper River basin, western Susitna valley, southeastern Alaska, Tanana basin, upper Koyukuk-Brooks Range, Bristol Bay-Alaska Peninsula, and the North Slope. Products of these studies will include surficial and

bedrock geology maps, hydrologic maps, vegetation maps, and various reports dealing with coal, oil and gas, minerals, and industrial and construction materials.

DGGS is now soliciting nominations of specific areas within these nine general regions for which 1:63,360 or larger-scale maps are desired by industry and the general public. Send your selections to: Ross G. Schaff, State Geologist, 3001 Porcupine Drive, Anchorage, AK 99501.



DGGS has many new faces

DGGS is gearing up for big minerals mapping efforts and oil-lease sales. Consequently, there is a raft of new faces around the various offices. Among them are three petroleum geophysicists, one chemist, three geologists, one hydrologist, two clerk-typists, two cartographers, and nine geological assistants.

The chief petroleum geophysicist is James J. Hansen, who was previously employed by the U.S. Geological Survey in Anchorage. Hansen will be in charge of seismic data acquisition and interpretation for tract evaluations. He has a B.A. in physics from Linfield College and an M.S. in applied geophysics from the University of Houston. Jim is married and has two children. His hobbies are fishing and camping.

Working with Hansen will be two former USGS Conservation Division employees, John F. Meyer and Donald L. Krouskop. Meyer has a B.A. in mathematics from UC-San Diego and an M.A. in geophysics from the University of Hawaii. A bachelor, John likes skiing and soaring. Krouskop has a B.S. from Texas Tech in physics. He is married and likes skiing and fishing.

Thomas A. Benjamin is the new chemist. Benjamin has a B.S. degree from the Colorado School of Mines and is working on assays and geochemical analysis in the College office. Before coming to DGGS last fall, he worked for 2 years for Resource Associates of Alaska in Fairbanks. The 29-year-old bachelor likes outdoors sports.

Geologist Stuart E. Rawlinson will be mapping surficial deposits within the Beechy Point Quadrangle, in north-eastern Alaska. Rawlinson has a B.S.

from Cal State at Long Beach and an M.S. from UA. His wife, Carol, is an archeologist. Stu's hobbies are river running, flying, and Taekwon-Do.

New in Anchorage is petroleum geologist Richard W. Kornbrath, who is evaluating the petroleum potential of state lands prior to leasing. He is now working on the Cook Inlet areas in preparation for upcoming state lease sales 32 and 33. Kornbrath has degrees in geology (B.S., Allegheny College; M.S., University of North Dakota) and came to DGGGS from the USGS Conservation Division in Anchorage. Rich lists his hobbies as photography, skiing, and river running.

Returning to the DGGGS fold is Dr. John E. Decker, a geologist based in College. Decker returned from California, where he completed his Ph.D in geology at Stanford University. He was employed by the USGS. (Four years ago, Decker was a summer geological field assistant with DGGGS.)

To help with the expanding workload, DGGGS has hired a pair of cartographers. Dr. Karen S. Pearson, who works in College, has M.S. and Ph.D. degrees in geography from the University of Wisconsin (specializing in cartography) and a B.A. in art history from Barnard College. She came to DGGGS from the University of Nebraska, where she taught cartography. She and her husband, Roger, a UA associate professor of geography, have a daughter, 7.

New cartographer Michael E. Pritchard is digging into the backlog of mapwork in Anchorage. Pritchard is a 5-year veteran of state service, coming to DGGGS from the Departments of Transportation and Natural Resources (Forestry). Mike and his wife, Janetta, have two daughters, 8 and 7.

Larry L. Dearborn, the new hydrologist, was with the USGS Water Resources Division in Anchorage for 16 years before joining DGGGS. He will specialize in ground-water data acquisition. A former UA student, Dearborn obtained his B.A. degree in geology from the University of Colorado. Larry and his wife have two children, 3 and 4.

Received with especially open arms were new clerk-typists Crystal D. Burgess, who toils in the Anchorage office, and Ruth H. Decker, who holds down the College fort. Both were

greeted with a standing ovation and a stack of typing.

Among the new geological assistants are Mary D. Albanese, Laurel E. Burns, Cathy A. Bush, James G. Clough, Roy W. Ireland, Kristin Kralik, Larry Lueck, William H. Mitchell, Jr., and Diana J. Solie. These people will be working in a variety of fields, ranging from hydrology to hazards.

In Juneau, DGGGS has a new mining-information clerk. He is Donald A. Gaines, who started in December. Don formerly worked for U.S. Customs.

Completing the swap for Hansen, Meyer, Krouskop, Kornbrath, and Dearborn was supergeologist Dr. James R. Riehle, who left to work for the USGS Branch of Alaskan Geology, in crosstown Anchorage.



Third annual Placer Conference in April

(from Mukluk News, Tok, Alaska, Jan. 1, 1981)

The UA School of Mineral Industry and the Alaska Miners Association announce the third annual Alaskan Placer Mining Conference, to be held at the University of Alaska at Fairbanks on Wednesday and Thursday, April 1 and 2.

Papers are being presented on many phases of placer mining, including geology, exploration, mining methods, and economics. Those interested in describing an operation, procedure, or any other facet of placer mining may contact Dr. Ernest Wolff, MIREL, University of Alaska, Fairbanks, AK 99701 (ph 479-7135).

In addition, there will be both an outdoor trade fair for displaying large-scale mining equipment and an indoor trade fair for those wishing to show small equipment and services. Those interested in displaying should also contact Dr. Wolff.



Pick a number....

Pssst. Hey buddy. Want to get in a numbers game? I know a place with a bunch of numbers. DGGGS has three new phone numbers and an address you can memorize.

The Anchorage office, at 3001 Porcupine Drive, has expanded. As a result, they have a new telephone number, 274-9681. (Note the cleverness of the Anchorage telephone folks: for

ease of remembering, not one of the seven numbers is duplicated).

Meanwhile, in Fairbanks, the numbers game continues, with all the old telephone numbers on the UA West Ridge converted to one new number, 479-7147. (But the DGGs mining-information office remains 479-7062).

In Juneau, you will be pleased to find there is no change in the phone number (465-2415) of the mining-information office. However, if you go there, it won't be there. The office, you see, has moved to the nearby Marine View Building, at 230 So. Franklin St., Room 407. All mail should be directed to this address, rather than the DNR office in the State Office Building (Pouch M).

Isn't it nice how some things never change?

7,877 new claims filed

Most miners apparently used their maximum 90-day filing period before heading for the Records Office, according to DGGs mining-information specialist Mildred Brown. There were 7,877 new mining claims filed last fall, a substantial increase over the summer quarter (5,012). In fact, the month of heaviest activity, November, saw almost as many claims filed (3,475) as the total for the whole fall quarter of last year (3,596). The totals by recording office are:

	Sept.	Oct.	Nov.	Dec.
Fairbanks	1,128	683	626	450
Barrow	2	0	37	0
Manley Hot Spr.	87	287	102	56
Nulato	45	30	145	2
Mt. McKinley	6	116	122	13
Nenana	17	5	46	56
Rampart	0	0	0	0
Ft. Gibbon	77	41	0	5
Kotzebue	13	0	1,130	0
Talkeetna	124	79	625	104
Palmer	20	26	8	8
Nome	329	42	117	0
Seward	0	2	4	2
Juneau	61	48	66	12
Haines	11	5	6	0
Petersburg	9	0	6	0
Ketchikan	56	126	69	7

Sitka	3	0	13	0
Aleutian Is.	0	14	7	1
Seldovia	0	0	62	0
Cordova	0	11	2	4
Chitina	5	93	13	18
Valdez	0	7	2	4
Kuskokwim	0	36	267	13
Kodiak	2	0	0	0

1,995 1,652 3,475 755

On a related note, James C. Barker of the U.S. Bureau of Mines issued a plea to all miners filing new location notices. He asks that they be sure to have a good sketch map included with their document—one showing township, range, and section. This is for claims on both state and federal land.

The reason for the request is that the U.S. Bureau of Mines is completely revamping the series of mylar overlays of mining claims that they provide to the DGGs mining offices, and wants to expand the scope from the current 4-inch-to-the-mile scale (1:250,000) to 1 inch (1:63,360). 'If the miners cooperate,' Barker said, 'the system will be much more accurate.'

Painting of old Kennecott Mine hangs in DGGs Anchorage office

Long-time Alaska geologist Marvin Mangus presented DGGs with his newest and largest work—a painting, 44 by 60 inches, of the Kennecott Copper Mine at McCarthy, Alaska as it existed shortly after the mine closed in 1938. It hangs in the newly completed DGGs addition at the Anchorage office.

State law requires that a percentage of the cost of new buildings be used for the creation of an artwork. Mangus was contracted by DGGs for this purpose last summer.

State Geologist Ross G. Schaff said, 'The public—particularly the mining community—is cordially invited to stop by and view this excellent representation of Alaskan mining history.'

The first bonanza discovery of gold in Alaska occurred in 1898 on the beaches of what is now the town of Nome.

**Geology of Cosmos Hills, Independence Mine
are topics at AMA convention**
(from *Alaska Miner*, Nov. 1980)

COSMOS HILLS

This is an abstract of a technical paper presented at the Alaska Miners Association convention in Anchorage last fall by Murray W. Hitzman of Stanford University.

The Cosmos Hills lie 10 km south of the Brooks Range and contain Kennecott's Ruby Creek prospect. They expose approximately 1,500 m of Devonian metasedimentary rocks. The lower 900 m of section is dominantly metamorphosed shales with interbeds of basic metatuffs, marble and meta-quartzites; it is a regressive sequence with an increase in carbonate rocks through time. Approximately 700 m of carbonate rocks conformably overlie the pelitic section. Clean, well-foliated marble is the dominant lithology. Volumetrically minor diagenetic dolostones preserve bedding with rare cross-bedding and occasional rip-up clast breccias; zones of bioturbation are common. Fossil debris forms discrete matrix-supported dolostone mounds; no true organic reefs are known. This section also contains beds of white mica-chlorite-carbonate-albite phyllite which thicken northward and probably represent an air-fall tuff deposit. Along the northern edge of the carbonate platform are finely laminated, graphite-calcite-pyrite lenses which are thought to be lagoonal deposits.

The carbonates represent a regressive subtidal to intertidal carbonate bank with scattered organic mounds and a burrowing fauna. The bank was 3 to 5 km wide, and paralleled the volcanic trend of the Ambler District for over 40 km. Lenses of phyllite, graphitic marble, and greenstone interfinger with carbonate rocks on the southern margin of the Cosmos Hills and indicate of a clastic basin with basic volcanics to the south. To the north, the carbonate bank undergoes a rapid facies change to graphitic marble and finally black phyllite. Rapid facies change, the linear pattern of the facies break, and slump features along this break suggest the facies boundary may have been fault controlled. Carbonate deposition was terminated in the late Devonian by a

major transgression and deposition of shale, now phyllite.

Copper-cobalt-zinc mineralization occurs in massive, fine-grained epigenetic (hydrothermal) dolostone bodies concentrated at the northern facies change from clean carbonate sediments to graphitic carbonates. Sulfides are in veins formed by fracture of the dolostone bodies; chalcopyrite generally replaces earlier formed pyrite. Massive sulfide with bornite occurs as replacement pods on the edges of the dolostone bodies.

The structure of the area is dominated by a tight folding event (F2), of probably late Paleozoic to early Mesozoic age, with east-west trending axes. Strain in the carbonate section was relieved by recrystallization and flowage of marble; dolostone was not recrystallized and behaved as brittle pods in a plastic matrix. Following F2 deformation, the Kogoschist, a block of metavolcanics and metasediments, was thrust over the Devonian section, probably from the north; the Asbestos Mountain serpentinite floors this thrust plate. A second thrusting event in the mid- to late Cretaceous emplaced the Angayucham metabasalt and Cretaceous molasse deposits as thrust sheets; movement was from south to north. Two open folds(?) with roughly east-west and later north- to northeast-trending axes were the final structural events affecting the Cosmos Hills.

INDEPENDENCE MINE

This is an abstract of a paper given by Dennis G. Wetherell.

The Independence gold mine is located in the Willow Creek mining district about 20 miles north of Palmer. The host rocks are mainly very uniform, coarse equigranular quartz diorite of the Talkeetna batholith.

Locally, diorite is intruded by aplite, pegmatite, and basaltic dikes. Generally the country rocks are barren except for traces of pyrite and chalcopyrite.

The ore consists of a gold-bearing quartz vein which strikes northerly and dips 20 to 30 degrees westerly. At depth the vein splits into hanging-wall and footwall segments, both of which

contain gold.

A third gold-bearing vein, known locally as the 'Upper' vein, lies about 50 feet above and is parallel to the hanging-wall vein. Ore-grade vein material is generally characterized by a subtle gray-blue banding or by weak brecciation.

About one-half of the gold is free milling; the remainder occurs interstitial to or as inclusions in pyrite, galena, arsenopyrite, and (?)telluride. The gold-bearing veins occur in strongly altered shear zones which extend outward a few inches to over 10 feet from the vein.

Principal alteration minerals are sericite and quartz, but chlorite and hematite are locally abundant. These shears are mineralized and in some cases constitute ore. The Independence vein system is cut by numerous post-ore faults, most of which have displacements of several inches to a few tens of feet. However, movement across the Martin fault, which cuts through the western margin of the mine, may exceed several hundred feet.

This fault is upthrown to the west (normal motion) and has an apparent component of right-lateral, strike-slip motion. The Independence vein system is considered to be a typical hydrothermal vein deposit formed at moderate depths as the Talkeetna batholith cooled.

◆ The 'Good Old Days' highlighted in letter from DGGs files

Hey, Bunky. Is the rising cost of helicopter charter fees getting you down? Are you having trouble laying in enough freeze-dried steak for the next field season? Have you found that the styrofoam seat cushion on your trail bike needs replacing?

Well, relax and enjoy your luxury. We found a letter in the DGGs archives that Henry Joesting, former geophysicist-geologist of the Alaska Territorial Department of Mines, wrote to his boss, B.D. Stewart, in Juneau. You may enjoy excerpts of the letter, dated Aug. 22, 1942.

"We had an unfortunate accident while returning from the Fortymile and consequently were delayed about a week.

While floating down the Tanana our small boat was stove by a log jam and we were marooned several days until Herman Kessler's gasboat came along. We went upriver with him to Tanacross; this took another two days, and from Tanacross we went to Fairbanks by plane. Most of our equipment, which fortunately amounted to less than usual, was lost in the river. We escaped with no more than a few duckings and some minor abrasions. But I had better start at the beginning.

"In my letter of July 2 and 14 I mentioned that plans had been made to fly to My Creek in the Fortymile to look at an antimony prospect. We had a small Curtis-Robin plane lined up to land us at a nearby field. It had no radio, but permission had been obtained from Col. Carr to use it. Later, however, the CAA refused to allow the plane to take off. No other planes could be secured for the trip; none of the pilots would land a larger plane on the small field. After I saw the field I came around to their point of view.

"But since all arrangements had been made prior to the cancellation of the flight and since Dan Manske, one of the owners of the prospect had quit work to make the trip, I agreed to walk in from Chicken, a distance of about 75 miles. Because of the change in plans I took Anderson along. This would allow Manske and his partner Fred Purdy to remain and prospect, while Andy and I returned earlier.

"In order to travel fast, we traveled light. Grub and bedding were dropped 10 miles from the prospect and we carried just enough food for the trip. We hoped to make it in three days. This would mean only two nights with no bedding. Actually we took nearly four days because it rained every day and then got clear and cold at night, so we missed a lot of sleep and got pretty tired. Andy got only three hours sleep, all on the third night. I did somewhat better, but still wasn't exactly fresh when we arrived.

"After looking at the various prospects for a few days Andy and I decided to go out by way of the Tanana River to look for a possible winter cat trail. We took a little bacon, flour, and tea, and a .22 rifle and made the 70 miles to the Tanana in 3-1/2 days,

landing about 25 miles above the Johnson River. The ridges afforded excellent going and we found an easy route for building a winter cat trail.

"After reaching the Tanana we started to build a raft to get to Big Delta, or at least to where we could get a boat. While getting logs we met an Indian, one Jimmy Walter, who agreed to lend us his river skiff. The agreement was that if we could ship it back from Big Delta we would get \$20 rental, but if this was not feasible we would keep the boat and pay him \$50. I also got some grub from him, which boosted the totals to \$25 and \$55. Jimmy is a very decent Indian; the only reason he let us have the boat was that he was afraid we would get into trouble with a raft. (So was I). The boat was in fairly good shape, and about 24 feet long. To replace it will cost more than \$50. Another thing that speaks well for him was that he trusted us for the boat and grub, since we had no money.

"Jimmy had a small Indian boy named Paul with him. Paul was quite sick, so he asked him to take him with us, to Fairbanks. This seemed a bit awkward, but I saw no decent way of refusing, so we laid him on the floor boards and started out.

"We reached the Johnson at 7 pm on July 30, making good time because the river was up to its high water marks. In places it was moving over 10 miles an hour. Two miles below the Johnson we saw a good-sized camp and went ashore to see who it was. It turned out to be a Public Roads Administration preliminary survey camp for the Delta-Tanacross road. We ate supper there--the first square meal in several days. On leaving we were advised that there was a bad whirlpool a mile downstream; that we should keep left, out of the main channel, to avoid being forced into a cliff.

"My big mistake was that I did not examine this advice more critically. I should have taken into account the fact that the boys at the camp are all newcomers and know less than nothing about river travel. Had I done so I would have followed the main channel, which we had been doing all along. I saw the whirlpool later and it wasn't so bad. At any rate we kept left and soon came to a place where we could not avoid a

log jam. We hit it at about 8 miles an hour. The boat stove and overturned before we could save our stuff. We grabbed the sick boy, but I couldn't help wishing that we could have grabbed our ore specimens instead.

"After washing downstream away the boat hung on the logs. We managed to right it, get it and the boy to a small island, where we built a fire with green alders and took stock of the situation. All we had was a .22 rifle and a small drill tarp; everything else was gone. Between us and the shore was a 60-foot channel that was running pretty full and fast. We were fairly sure we could swim it with no clothes on, but that would leave our clothes and the Indian on the island. So Andy stripped and made it across. He was a strong swimmer, but it took nerve all the same. I remained to patch the boat and make ready to get the boy and our clothes across to the mainland, while Andy returned to the PRA camp for help. They were somewhat open-mouthed when he walked stark naked into the cooktent.

"By the time the boat was patched and maneuvered to a favorable place Andy and about 8 boys had returned to effect the rescue. After many attempts they managed to heave over a handaxe to which a rope was tied. The full width of the channel was too great for the cast, so I had to stand on an out-jutting log and jump for the rope. After the rope was across I made it fast to the boat, shoved off and they swung us across in great style.

"We hit the jam about 7:30 pm and reached camp about 1:30 am. It took longer than one would suppose to work things out so we could get across with a minimum of risk. We were marooned in the camp for three days waiting for Kessler's boat. There was no other way out; the Johnson and Gerstle Rivers were too high to cross and we were lacking several items of clothing, including Andy's shoes and our socks, that would be necessary for a long trip. Most of the time was spent sleeping because we had accumulated considerable weariness."



Don't let your car engine idle for more than one minute. It takes less gasoline to restart your car than it takes to let it idle.

State placer permits listed
(from *Alaska Miner*, Nov. 1980)

Listed here are all the state and federal requirements that may be needed for a placer mining operation. Not all of them are needed for every operation, however; Section A lists the state certificates that are required for all operations. Section B describes the state permits that might be required, depending on the size, type and location of the mining operation. Section C lists the federal certificates that might be required, depending on the characteristics of the operation.

A. STATE REQUIREMENTS FOR ALL OPERATIONS

There are three forms that must be submitted for all placer mining operations every year, whether the mining is done on state land or federal land.

1. **Alaska mining license.**
(a) Required for anyone engaged in mining activities in Alaska; (b) The form can be obtained from Department of Revenue, Pouch SA, Juneau, AK 99811; (c) Issued for 1 year; (d) No fee; (e) If the form is complete, the license will be issued within 1 week.
2. **Affidavit of Annual Labor Performed.**
(a) Required to keep a mining claim valid. It gives proof that at least \$200 of improvement work was done on the claim during the previous year; (b) The form can be obtained from the Division of Minerals and Energy Management (DMEM), 703 W. Northern Lights, Anchorage, AK 99501; (c) issued for 1 year; (d) No fee is required by DMEM, but the State Recorder's Office charges a recording fee of \$8 for the first page and \$3 for each additional page; (e) The completed form must be taken to the State Recorder's Office for recording and then to DMEM for filing.
3. **Triagency permit.**
(a) One form applies for a Fish Protection Permit from Department of Fish and Game; a

Wastewater Disposal Permit from Department of Environmental Conservation; and a Miscellaneous Land Use Permit and a Water Rights Permit, both from Department of Natural Resources; (b) The form can be obtained from DMEM; (c) The application must be submitted once each year; (d) \$25 fee; (e) There used to be four different application forms to fill out and four different offices for a miner to go to. Now this one form, submitted to one office, applies to all four permits. You will still receive four separate permits.

B. STATE PERMITS THAT MAY BE REQUIRED.

Depending on the size, type and location of the mining operation, one or more of the following permits may also be required by the state.

1. **Discharge to Navigable Water certificate.**
(a) Required for any discharge to navigable waters; (b) The form is available from Department of Environmental Conservation (DEC), Pouch O, Juneau, AK 99811; (c) Issued for a maximum of 5 years; (d) No fee.
2. **Solid-Waste Disposal permit.**
(a) Required for disposal of all unwanted or discarded solid waste or hazardous material; (b) The form can be obtained from DEC, Pouch O, Juneau, AK 99811; (c) Issued for a maximum of 5 years; (d) No fee.
3. **Special Land Use permit.**
(a) Required to place temporary improvements or equipment on special state-owned land. This permit is needed instead of the Miscellaneous Land Use Permit if the special land designation was made before the permit application; (b) The form is available from Division of Forest, Land, and Water Management (DFLWM), 323 E. 4th, Anchorage, AK 99501; (c) Issued for a maximum of 5

years; (d) \$10 fee; (e) This permit is issued at the discretion of the director of the DFLWM.

4. **Tideland permit.**

(a) Required for any temporary, short-term use of state-owned tidelands or submerged lands; (b) the form is available from DFLWM; (c) Issued for a maximum of 5 years; (d) \$20 fee; (e) This permit is used, when needed, in place of the Miscellaneous Land Use Permit and the Special Land Use Permit.

5. **Offshore Locatable-Mineral Prospecting permit.**

(a) Required when prospecting for offshore locatable minerals on State land; (b) The form is available from the Department of Natural Resources, Pouch M, Juneau, AK 99811; (c) Issued for a 10-year period, not renewable; (d) \$20 fee.

FEDERAL PERMITS THAT MAY BE REQUIRED

The federal government also requires one or more permits, depending on the size, type, and location of the mining operation. Note: the NPDES permit (below) is required for all placer operations.

1. **National Pollutant Discharge Elimination System (NPDES) permit.**

(a) Required of all mining operations that discharge wastes into a waterway; (b) The form may be obtained from the U.S. Environmental Protection Agency (EPA), 701 C St., Box 19, Anchorage, AK 99513; the state triagency form satisfies some of the information requirements; (c) Issued for a maximum of 5 years. Apply 180 days before beginning to discharge; (d) No fee.

2. **Dredge-and-Fill Disposal permit.**

(a) Required to discharge dredged or fill material to U.S. waters or wetlands; (b) The form may be obtained from the Army Corps of Engineers, P.O. Box 7002, Anchorage, AK 99510; (c) Issued for 3 years; (d) \$100 fee for commercial

use; \$10 fee for noncommercial use.

3. **Prospecting permit.**

(a) Required to prospect on and explore specific federal lands; (b) the form is available from the Bureau of Land Management (BLM), Pouch 7-512, Anchorage, AK 99510; (c) Issued for 2 years; (d) \$10 fee, plus 25 cents per acre but not less than \$20.

4. **Recording of mining claims.**

(a) Required of all holders of unpatented claims on federal land; (b) There is no specific form. Contact the BLM; (c) The recording is needed once only, but evidence of assessment work must be filed annually; (d) \$5 per claim.

5. **Oil-Spill Prevention, Control and Countermeasure (SPCC) plans.**

(a) Required if above-ground storage of fuel will be provided for as much as 660 gallons in a single tank or 1,320 gallons in more than one tank; (b) No specific form. Contact the EPA; (c) The plan must be developed within 6 months after operation begins; (d) No fee.

6. **Upland locatable mineral rights.**

(a) To obtain rights to locatable minerals on State uplands, you must stake a prospecting site or mining claim and file a Location Notice with the District Recorder's Office in the area in which the site or claim is located and with DMEM; (b) The location notice form is available from a stationery store; (c) Expires on September 1st of each year; (d) No fee.

USGS, DGGs release Geologic Map of Alaska

Copies of the final printing of the Geologic Map of Alaska may now be purchased for \$3.50 from USGS Public Inquiries Offices in Alaska. The map, the result of extensive compilation and revisions by USGS author Helen Beikman, is the final product of a cooperative

effort by USGS and DGGS geologists during the '70s. State Geologist Ross C. Schaff commented, 'The previous geologic map of Alaska was notorious for the numerous white areas which indicated no information was available. The only white areas remaining are Alaska glaciers. This is some indication of the progress geologists have made toward an understanding of Alaskan geology during the last two decades.'



Geothermal potential exceeds oil
(from *All-Alaska Weekly*, Oct. 31, 1980)

The Geophysical Institute of the University of Alaska-Fairbanks has just released a report estimating that Alaska's geothermal energy resource base is the energy equivalent of seven times the total anticipated oil production from the Prudhoe Bay field.

Titled "Geothermal Energy Resources of Alaska," the report is designed to show Alaskans where known geothermal energy resources are located in our state. A map and accompanying data table, designed to present statewide geothermal energy resource information in a convenient and easy-to-use graphic format, is included in the report.

Most Alaskan hot springs are located far from present population centers; but as energy costs continue to spiral, it may be feasible to consider establishing new communities in areas where geothermal wells could provide cheap energy for space heating, agriculture and, in some cases, electrical power generation, according to Dr. Don Turner, senior author of the report.

The purpose of the project has been to compile and organize information which has previously existed only in a myriad of publications, generally of a technical nature, which were not readily available to the public. A considerable body of previously unpublished information has also been included through the cooperation of Alaska Division of Geological and Geophysical Surveys, the U.S. Geological Survey and numerous individual geologists.

The research described in the report was funded by the Geothermal Energy Division of the U.S. Department of Energy. The report is available

from the Geophysical Institute Library on campus for \$7.50 (UA, Fairbanks, 99701).



**DGGS publishes oil-potential,
Cook Inlet geology reports**

DGGS 'published two new' geologic reports this quarter; one on the northeastern part of the state may be of particular interest to former Interior Secretary Cecil Andrus. The other is a two-plate map of the upper Cook Inlet, and should be of interest to Anchorage-area denizens.

The former, Geologic Report 76, states that the Arctic Wildlife Range has excellent potential for discovery of commercial hydrocarbons or oil. (Last summer, Andrus stated that the Wildlife Range was not as good a prospect as the National Petroleum Reserve in Alaska—a fact refuted both here and by geologists in his own scientific arm, the U.S. Geological Survey.)

The report, 'Post-Early Triassic formations of northeastern Alaska and their petroleum reservoir and source-rock potential,' was written by W.M. Lyle, I.F. Palmer, Jr., J.G. Bolm, and L.R. Maxey. It has 100 pages of text, plus an envelope with 14 blackline plates. It costs \$15 over the counter (\$16 postpaid). The abstract follows.

"During the 1979 State-Federal North Slope field project, more than 5,000 feet of stratigraphic section and 10,000 feet of traverse along strike were measured and 306 samples were collected and analyzed. Significant new paleontological age determinations and data concerning petroleum reservoir- and source-rock potentials, depositional environments, diagenesis, and organic geochemistry were obtained.

"Data collected indicate that the regional Mesozoic-Tertiary stratigraphic pile consists of interbedded good to excellent quality mature source rocks and extensive tabular or linear sand bodies in which good to very good secondary porosity has been observed at the surface and may be inferred to exist in favorable subsurface locations. We conclude that the basins of the Arctic Coastal Plain in northeastern Alaska and adjacent offshore areas which are filled with these sediments have excellent potential for dis-

covery of commercial hydrocarbons."

The report concludes, "The juxtaposition of laterally extensive potential reservoir sandstone units with organic-rich, mature source rocks indicates excellent potential for commercial hydrocarbon discovery in the basins of the Arctic Coastal Plain in northeastern Alaska and adjacent offshore areas."

The second report is a two-plate, full-color map of part of upper Cook Inlet. Geologic Report 64, 'Photo-interpretive map of the surficial geology from Polly Creek to McArthur River, Cook Inlet, Alaska,' is compiled by James R. Riehle and Karen S. Emmel. The map is based on field work performed by helicopter in 1978.

According to State Geologist Ross G. Schaff, 'The map is one of the best we have ever printed. It substantially extends the limits of surficial mapping in the upper Cook Inlet.' The report sells for \$10 (\$11 postpaid).

DGGS issues call for 'Short notes - 1981' contributions

DGGS is issuing a call for contributions to its fifth report in the series, 'Short notes on Alaskan geology.' The coming issue is for the year 1981, and will be published this fall.

'Short notes' is a volume that is devoted to brief articles by earth scientists both within and outside of DGGS who have made recent investigations of a limited scope on Alaskan geology.

Manuscripts are accepted for review with certain qualifications: a) they must not have been published or submitted for publication elsewhere; b) all persons listed as authors have given their approval for submission of the paper; and c) any person cited as a source of personal communication has approved such a citation.

Send two copies of the manuscript, typed double spaced including references and figure captions, to Editor, Alaska DGGS, Box 80007, College, AK 99708. No more than seven double-spaced manuscript pages (2,000 words), including references, figures, and tables, will be accepted. All figures should be camera ready and suitable for black-and-white reproduction at a maxi-

mum size of 6-1/2 by 8-1/2 inches; foldout or color art will not be accepted. All manuscripts will be examined and approved by DGGS reviewers.

Each author will receive 10 free copies of the 'Short notes' when it is published.

Deadline for manuscripts for the 1981 Short notes on Alaska geology is May 1, 1981.

Geologic Report 63, 'Short notes on Alaskan geology, 1979-80,' will be available by March 15. It will sell for \$1.



Large cement firm to use Healy coal (from Fairbanks Daily News-Miner, Nov. 25, 1980)

The Alaskan coal being shipped to Korea for test burning will soon fire the furnaces of the world's largest cement company, Usibelli Coal Mine president Joe Usibelli said Monday.

If the test burning of 33,000 metric tons of coal from the mine at Healy proves it can be substituted for Australian coal, a long-term contract for sales of a half million tons a year may have Alaska's first coal export program under way by next summer, he said.

"The railroad shipping of the coal from the mine to the Port of Anchorage is almost finished," Usibelli said. A Korean ship is expected there Dec. 10 to load the coal, and it is supposed to sail for Korea Dec. 13.

The tests will take 60 days after the coal arrives in Korea.

"It's running more smoothly than I expected it would for a first shot like this," Usibelli said. The coal filled about 500 railroad hopper cars in shipments to Anchorage, where it is unloaded at a gravel company and taken to the port by truck.

Usibelli is selling the coal to the Sun Eel Alaska Corp., which is acting as a broker and shipper to put the deal together on the other end. Sun Eel is selling the coal to the Ssang Yong Cement company.

"We have a contract for this shipment only," Usibelli said, but he added, "we have exchanged draft contracts for long-term sales."

He said exports would probably start at one-half million metric tons a year, which is about two-thirds of what the mine is now producing for local

power plants and home heating customers.

"We could go double that without any real problem," Usibelli added.

Ssang Yong Cement now burns coal from Australia, he said, and the tests will determine how the lower-quality Alaskan coal performs in the same kilns.

"They will add a little of our coal at the start, increasing the percentage until, we hope, it gets all the way up to 100 percent," Usibelli said. "I think it will do a lot better than they expect it will."

He said the test program is the result of four years of negotiations with Korean companies. "We are closer to them for shipping, and they would like to have more than one source of coal," he said. "Also, the Australian labor situation is terrible right now, and it's liable to remain so."

"It's been a very complicated deal," he said. "They also get a balance of trade advantage because Korea exports a lot of goods to the U.S. and it helps their relations if they are buying something from us in return."

"Also, although I wonder about this at times myself, they look on the U.S. as having a very stable government," he quipped.

But transportation bottlenecks will have to be eased at both ends before major shipments begin. Usibelli said his mine will start construction in April of a new tipple for loading coal into railroad cars.

"We hope to have the new tipple in operation Oct. 1, but we are willing to start out with the old one," he said. "If the test burn goes as well as I think it will, they may want to start shipments as early as May 1."

The shippers buying the coal from Usibelli will have to build a facility at the Port of Anchorage for getting the coal out of hopper cars that dump their loads through the bottom.

The lack of unloading facilities at Anchorage means the coal has to be unloaded away from the port now, Usibelli said, and taken by truck to the dock. "If we go to a long-term contract, there will be an unloading facility at the dock," he said. "That will be something for Sun Eel and the Alaska Railroad to put together."

'Anchorage bluffs still vulnerable to quake'

(from Fairbanks Daily News-Miner, Oct. 11, 1980)

A state geologist says bluff areas of Anchorage, such as Government Hill and Bootlegger's Cove, would be subject to extensive damage in the event of another major earthquake.

Randall Updike of the State Division of Geological and Geophysical Surveys said a two-year study of bluff areas indicates conditions "are just as bad as they were before the 1964 earthquake."

Updike's two-year study covered the geological makeup of the ground underneath Government Hill and Bootlegger's Cove, areas both hard-hit by the Good Friday earthquake of March 27, 1964.

Updike said surveys show significant deposits of sensitive clays and liquefiable sands in bluff areas of the city, which could lead to extensive structural damage in a major earthquake.

He said the potential for major damage should be considered in any major construction planned in those areas.



Gilbert gives talk on Alaskan tectono-stratigraphic terranes at AGU meeting

In a paper presented at the American Geophysical Union annual meeting in San Francisco in early December, DGGs geologist W.G. Gilbert and co-workers suggested that 'the central part of the Alaska Range near Mount McKinley is composed of nine separate tectono-stratigraphic terranes that were accreted during late Mesozoic time.' The paper, entitled 'Age, character, and distribution of accreted terranes in the central Alaska Range, south-central Alaska,' by Gilbert and D.L. Jones, N.J. Silberling, and Peter Coney of the U.S. Geological Survey, was one of several that described the fragmented geologic nature of Alaska and its complex tectonic history.

In another paper, 'Timing of accretion of Alaskan tectono-stratigraphic terranes,' D.B. Stone of the University of Alaska-Fairbanks presented evidence that several of the geologic terranes that make up southern Alaska accreted far south of their pre-

sent location prior to Cretaceous time, and that the accreted block 'did not become part of North America-Alaska until well into the Tertiary.'

Packed meeting rooms and intense discussions characterized the session discussing the tectonic history of Alaska.



State, Japanese agree on Beluga coal study
(from Fairbanks Daily News-Miner, Nov. 25, 1980)

An agreement has been reached between three major Japanese energy firms and the state of Alaska on a study of possible production of 1 billion tons of coal in Alaska, an official involved in the deal said. A pact agreed on recently in Anchorage called for the trio of Japanese firms to join the Alaska state authorities in an effort to develop bituminous coal reserves in Beluga, 93 miles west of Anchorage, starting next summer, an Electric Power official said Tuesday.

The Japanese firms are the government-backed Electric Power Development Co., Coal Resources Development Co. and Tokyo Electric Power Co.

A previous study by the two American mining interests controlling the Beluga area, including Placer Amex Inc., estimated about 7 to 10 million tons of bituminous coal may be produced from the region every year, he said.

The spokesman said an unspecified part of that volume will be shipped to Japan in later negotiations.

By 1985 the Alaska coal is estimated to equal 40 percent of Japan's total coal imports---about 22 million tons.



**Arctic drilling plans begin to unfold
as Court threats dissolve**

(from Alaska Business News Letter, Nov. 7, 1980)

Following recent announcements indicating that the court fight to block Beaufort Sea oil operations is at an end, and as freezeup marks the start of the winter season, drilling plans begin turning into realities. Sohio announced completion of the two man-made islands for offshore drilling this winter and began work on the Challenge Island wildcat. It is the first of four offshore tests the company plans to complete this season. Exxon Co.,

U.S.A. is also preparing to build a gravel island drill pad, about midway between its Duck Island oil discovery and the McClure Islands group in the barrier chain. A well drilled there could test a block of state claims for which a group of companies, including Exxon, paid more than \$162 million of bonuses to acquire in the 1979 joint offshore lease sale.

Exxon is also busy in the arctic uplands. It is preparing to build a gravel pad for the Point Thomson No. 6 well and applications to the state indicate it plans to begin drilling in the near future on the nearby Alaska State "D" and "E" wells. Also on the arctic uplands, Conoco, Inc. is obtaining the necessary authorizations for a gravel pad to drill the Milne Point No. 2 near the site where it drilled a dry hole last winter. Chevron is expected to drill a second location on Arctic Slope Regional Corp. lands this winter, although no timetable has been announced. Preparations for all of the arctic winter activity reportedly plugged the air-freight handling capabilities of Fairbanks this fall. The city reports that rental housing vacancies have dropped to the lowest level since August 1977.

Although drilling rigs actually running hit the lowest point in a long time this week---seven onshore and one offshore, according to Hughes Tool Co. statistics---another seven were being rigged up to begin work and it is believed as many as 20 or more will operate on an average through the winter season. More rigs are expected to come into the state, or be built here, next summer and the average number of rigs operating could climb to 30 or more in 1982.

One new rig already announced for 1981 will be barged in to a site near Yantarni Bay on the Alaska Peninsula where it will drill a targeted 12,000-ft exploratory hole for Chevron, U.S.A. on a 68,000-acre block of Koniag Regional Corp. lands being held under an exploration agreement. Beachhead, road and drillsite work is being done this winter with drilling operations scheduled to begin next spring. The Alaska Peninsula was subjected to some of the earliest oil exploration in Alaska.



Memorial to John B. Mertie, Jr.

By Robert M. Chapman,
U.S. Geological Survey, Menlo Park, CA

Dr. John Beaver Mertie, Jr., an eminent geologist and well known as a pioneer in Alaskan field geology, passed away in Rockville, Maryland on December 7, 1980, at the age of 92. His career in Alaska spanned the years 1911 through 1942. He was born in Baltimore, Maryland on January 22, 1888, received an A.B. degree in 1908, and in 1911 a Ph.D. degree in geology from Johns Hopkins University.

Mertie held summer field assistant positions with the U.S. Geological Survey (USGS) in Colorado and New Mexico during 1908-1910, and in 1911 joined the USGS as a full-time geologist and petrographer. He was assigned, at his request, to the Alaskan Division (later the Alaskan Branch), and began field-work under L.M. Prindle in the Yukon-Tanana region. He continued Alaskan studies through 1942, eventually working in nearly every part of Alaska, but he devoted most of his time to reconnaissance geologic mapping and to studies of gold and platinum placer deposits in the Yukon and Kuskokwim Rivers basins. His publications (more than 70) contain a wealth of geologic information and interpretations, as well as mining, geographic, and historical data, relative to the interior Alaska region, including the Chandalar-Sheenjek, Eagle-Circle, Ruby-Poorman, Ophir, Kaiyuh Hills, Nushagak, and Goodnews Bay districts, and also to parts of the northwestern Alaska, Seward Peninsula, Copper River, and southeastern Alaska regions.

During the 29 field seasons of 3 to 5 months each that Mertie spent in Alaska, he made many long, arduous traverses by foot, pack-horse train, canoe, boat, and dog team in remote and largely unmapped regions, exploring and mapping geology. He regularly visited many of the active placer and lode mining districts, and developed a fine rapport with the miners and other residents. His notes and publications reflect a true appreciation for Alaska and the Alaskan hospitality extended to him.

Dr. Mertie's sound scientific background and expertise in mathematics

as well as geology took him into fields other than Alaskan geology. In 1917-18 he and geologist Fred H. Moffit did pioneering research to develop new techniques for aerial photogrammetry and instructed Army flyers in the use of aerial cameras. In 1920-21, on leave from the USGS, he did petroleum-oriented geologic exploration for Carter Oil Company in Bolivia, Argentina, and adjacent South American countries. In 1943 he transferred to the Geologic Branch of the USGS and spent a year investigating sources of quartz suitable for production of radio oscillator crystals, which were then in critically short supply for wartime needs. Following this, until he reached mandatory retirement at age 70 in 1958, he evaluated gold placers in Idaho and Oregon, and worked 10 years on alluvial deposits of monazite and the related source rocks in southeastern United States. Drawing on his experience with the gold pan in Alaska, he extracted, by panning, the monazite, xenotime, and zircon from deeply-weathered granitic rocks of the southern Appalachians, and identified extensive belts of monazite-bearing rocks that are described in several USGS publications, the last of which was published in 1979.

Mertie's interest in platinum deposits, dating from his studies of the southeastern Alaska deposits in 1917 and the Goodnews Bay deposits in 1937, continued into his active-retirement years, when he served as the USGS platinum commodity geologist. He revisited Goodnews Bay in 1966, 1968, and 1969 to gather data to supplement his previous geologic work and he published a Professional Paper on "Economic geology of the platinum metals" in 1969, and one on "Platinum deposits of the Goodnews Bay District, Alaska" in 1976.

Dr. Mertie's publications included mathematical papers as well as those on geology, and in 1980 he was nearing completion of a paper on an advanced mathematical concept. He was a member of Phi Beta Kappa, various geological, geochemical, mineralogical, and mathematical technical societies, was a charter member of the Society of Economic Geologists, President in 1939 of the Geological Society of Washington

(D.C.), and received in 1958 the Distinguished Service Award of the Department of the Interior.

I was fortunate to visit Dr. Mertie in October 1980 and found him well and alert. He recounted some of his geological and Alaskan experiences and inquired about our current geological research in Alaska. Alaskans, geologists, and miners are indebted to John B. Mertie, Jr., for the contributions he made to Alaskan geology and economic geology during a long and dedicated scientific career.

Compromise bill to preserve Alaskan lands approved

(from New York Times, Nov. 13, 1980—p. 1)

The four-year battle over how to use Federal lands in Alaska ended quietly today when the House approved and sent to the White House a Senate measure designating more than 104 million acres as national parks, wildlife refuges and national conservation areas.

The lands, scattered throughout Alaska, are larger in total area than the state of California.

In a statement issued by the White House, President Carter said he was pleased and gratified by the House action.

"Both Houses of Congress have now endorsed the greatest land conservation legislation of the century, thus assuring that the 'crown jewels' of Alaska's natural wonders are afforded protection," Mr. Carter said.

"Passage of a balanced Alaska lands bill has been my highest environmental priority since the beginning of my Administration, and the bill approved today closely resembles the proposals I sent to Congress more than three years ago," the President added.

The Senate measure, passed last August, does not go as far as the legislation approved by the House in 1979. The House version would have extended special protection to 127.5 million acres, 67.5 million of which would be classified as wilderness areas. The Senate version designates 56.7 million acres as wilderness.

In a meeting with reporters earlier today, Representative Morris K. Udall, the Arizona Democrat who heads the House Interior Committee, said

there were provisions in the Senate measure to which he still objected.

"But it does accomplish 85 to 90 percent of the things the House wanted," he said. "Accepting it doesn't mean the Alaska job is done. We intend to correct the deficiencies in the next Congress."

The measure was passed by voice vote after a brief discussion.

When the measure is signed into law, it will speed up the transfer of virtually all of the 105 million acres of Federal land and the state of Alaska is to receive under the Statehood Act. It will also expedite conveyance of an additional 44 million acres that Alaskan native groups are to receive under the 1971 Land Settlement Act.

The Senate measure differed from the bill the House originally passed in permitting oil and gas exploration in the William O. Douglas Arctic Wildlife Range on Alaska's North Slope, the breeding ground of the continent's last large caribou herds. The House legislation designated that area as wilderness in which no development would be permitted.

While the measure will establish a 2.3-million-acre national monument wilderness in the Misty Fjords area of southeastern Alaska, it will also allow development on 149,000 acres surrounding the United States Borax & Chemical Corporation's molybdenum mine there.

The measure will also permit extensive logging on 20,000 acres of virgin timber in the Tongass National Forest on Admiralty Island and will appropriate \$40 million for access roads and other facilities to expedite this.

In urging House acceptance, Mr. Udall said he objected to all these provisions and would attempt to alter them in the next Congress.

The measure will add 43.6 million acres of national parks to those already established in Alaska. It will set aside 53.8 million acres of new wildlife refuges.

Representative Don Young, Alaska's lone member in the House, who fought against the House bill last year, said today that the Senate measure did open more areas to oil and gas exploration and this was good.

Mineral and mining notes

The following brief news articles were taken from the December 1980 issue of Alaska Industry.

Gold Rush Brings Need for Big Horses

The Gold Rush of 1898 took a terrible toll of horses, dogs, and humans, according to historians. The rush of 1980 has proved more civilized in its blood levy but is proving equally hard on the machines which have assumed the physical burden of extracting gold. As pipeline contractors discovered, even the heaviest earthmovers can find themselves well matched in frozen muck. Aircraft attempting to work off marginal strips engineered by bulldozer operators have also paid a price.

Denali Mining Co. spent a small fortune moving more than \$1 million worth of heavy equipment into its property off the Denali Highway before breakup last spring. After a full summer of effort the company reportedly failed to take out any significant amounts of gold. Sources say the company is modifying both its plans and equipment for a new effort next year. Jensen Mining Co. found itself poorer to the tune of one twin Beechcraft in early October when a crash in takeoff from the Candle airstrip totaled the plane but left the five occupants unharmed.

To meet the earthmoving challenge, miners are investing in modification of equipment to meet their requirements. NC Co. is modifying one of its 200 series front shovel excavators (a variation of a light backhoe with a beefed-up forward scooping articulated arm) for a placer miner working in the Dutch Hills area west of Talkeetna. The miner hopes the equipment will prove more durable than dozers or backhoes and result in less loss of values in working the bedrock paystreak. NC Co. is also said to be negotiating with Asamera Oil Corp. for a couple of D-10s (slightly smaller than an aircraft carrier) to strip as much as 200 ft of frozen overburden to reach the pay ground at Livengood where the company plans to go to large-scale production next season. The tractors generate up to 700 flywheel horsepower and weigh in at nearly 200,000 lb each.

Union Starts Hard-rock Work on Native Lands

Union Oil Co. of California has entered into a joint venture with Doyon Ltd. and Molycorp, Inc. to carry out a major exploration effort on some 850,000 acres of the regional corporation's lands in the Yukon-Koyukuk region of central Alaska. Union holds one-half interest and is acting as operator of the hard-rock mineral exploration program. Core drilling has reportedly begun in the search for various metallic ores, rare earths, and uranium. Uranium occurrences have been reported in various parts of the Yukon River drainage. Total expenditure and projected scope of the program have not been disclosed.

State Project to Help Miners "Clean Up Act"

Arrangements have been completed for a placer mining waste-water demonstration project next year which is intended to help miners find the most effective and economical techniques for bringing sluicing water back to acceptable discharge standards. Administered by the Department of Environmental Conservation, the program is being supported by both the state and federal government. DEC has made an agreement with a placer mine operator in the Circle district and hired R&M Consultants to design an optimum settlement pond system.

The pond will be put in place next spring and operated throughout the full mining season, under technical supervision. The work will be photographed and slide shows prepared. At least one field trip for interested parties will be arranged during the mining season at a time to be coordinated with the mine operator. Publication of the results and findings is to follow completion of the experimental project. Additional information may be obtained as it is available from the DEC office in Fairbanks.

Silver is Where You Find It

State treasury officials may prospect for gold in Zurich but Doug Anderson of Seattle and Hans Antonsen of Ketchikan have found 490 tons of silver just 75 miles southwest of Wrangell and it's theirs for the taking. The only problem is finding a safe, efficient way to take it from a sunken tugboat resting below 210 ft of

North Pacific ocean water. Some 15 to 20 tons of the silver concentrates were recovered about a year ago with a venturi-type dredge, before the salvagers decided to switch to a diving bell and cutter-head suction dredge as a more efficient operation. Given the current range of silver prices, the lode would be worth \$1.5 to 2 million, a lot of 'liquid' assets.

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Our Gangue....

By Frank Larson, DGGs editor

Riddle: When is tacky not tacky?
 Ans: Whenever you can out-Fed the Feds. It's quite simple, really. You see, Alaska has, in the span of two short decades, gone from the status of being a U.S. territory (the rapee) to an OPEC nation (the raper). Consequently, we now have obscene amounts of money coming into the state coffers. The trick, however, is to spend this booty without offending Big Brother, who may want to divide our largess with, say, Mississippi. Last year, as you will recall, we tried returning some of our oil bounty to the citizens of the state, based on the amount of tenure each has here. But to no avail. That idea got tied up in the courts and it may not see daylight again. Considerable public debate has occurred as to how can the money best be used....So let's be tacky. Let's be nouveau riche and spend it....For instance, we're now in a position where we can finally do something about that annual Alaskan malady, Cabin Fever. This has a lot of merit. It involves starting a new permanent fund, one designed to relieve our residents of the harsh winter climate. First, we'll form a commission to tour warm-weather sites to buy a 'State Vacation Spa' for us. Once we buy it, we Alaskans can simply fly there once a year for a free vacation, with the length of stay dependent on our length of residency---a nice, simple solution to our money 'problems,' right?....Now then, shall we buy a resort? No. (It would be too small.) A town? No. (Still too small.) An island? Noooo. (Even Maui gets crowded with Alaskans in the winter.) There's only one solution left. Let's be supertacky and buy our very own country---say, El Salvador or

Costa Rica. (On second thought, Costa Rica is out. Last I heard, Robert Vesco already had it.) Buying a country is not a revolutionary idea, you know. It was the 'in' thing in early 1945....Finally, when we have our state playground, as does Mother Russia on the shores of the Black Sea, we'll simply spend some more Big Oil bucks and form our own state airline to fly us there. Of course, we'll need a fitting name for our little shuttle service, one to remind the proletariat in the Lower-48 of Alaska's new heritage....We could call it BEA. It's short. It's an exotic-sounding abbreviation, like KLM, BOAC, and QANTAS. But best of all, you just know it would give the Washington paperchaser's fits whenever they'd see a planeload of us happy, carefree Blue-Eyed Arabs off to our rightful place in the sun....Meanwhile, back on the tundra, Asamera Oil has started a test program for its placer gold properties north of Fairbanks. Drilling results indicate about 20 million cu yd of gravel averaging 0.18 oz gold/yd....Little Squaw Gold Mining also revealed gold reserves on its 22 patented and 41 unpatented claims in the Brooks Range....In Southeastern, Amax Exploration of Denver has found enough encouraging signs to return for a fourth summer to the Wrangell area to look for more molybdenum. They have been drilling what appears to be a large moly deposit in Groundhog Basin, near the Canadian border....DGGs mining engineer Cleland Conwell, who wrote the article on gold recovery by cyanidation, in the Sept. '80 M&GB, says that he neglected to say that there is some danger involved. 'You should be careful when using cyanide or mercury in the recovery of gold,' he says....Speaking of the M&GB Bulletin, some readers may note that the name has changed. The publishing dates, too. We added the state name and dropped the word 'Bulletin.' Also, we moved the publishing dates back 1 month in the hopes of giving you more timely reports of both our field season activities and our fiscal-year plans. But a word of caution: You may need to lay in a stock of candles to read your January issue next year. You see, the last one to leave the state has to turn out the lights.....Adios.

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Metals Market

	<u>12/29/80</u>	<u>4 Months Ago (9/4/80)</u>	<u>1 Year Ago (11/30/79)</u>
Antimony metal per lb, NY dealer	\$ 1.47	\$ 1.50	\$ 1.48
Barite (drilling-mud grade per ton)	\$ 30-60	\$ 30-60	\$ 24-47
Beryllium ore, stu*	\$ 90.00	\$ 75.00	\$ 60-65
Chrome ore per long ton (Transvaal)	\$ 51.00	\$ 51.00	\$ 54-58
Copper per lb. (MW-prod.)	\$ 0.868	\$ 0.947	\$ 1.00
Gold per oz.	\$594.75	\$651.00	\$419.10
Lead per lb.	\$ 0.39	\$ 0.42	\$ 0.57
Mercury per 76-lb flask	\$360.00	\$390.00	\$335.00
Molybdenum conc. per lb. (Climax)	\$ 9.20	\$ 10.31	\$ 8.84
Nickel per lb. (cathode)	\$ 3.45	\$ 3.45	\$ 3.00
Platinum per oz.	\$475.00	\$696.40	\$545.00
Silver, New York, per oz.	\$ 16.15	\$ 17.20	\$ 18.77
Tin per lb., NW composite	\$ 7.69	\$ 8.53	\$ 8.12
Titanium ore per ton (ilmenite)	\$ 55.00	\$ 55.00	\$ 50.00
Tungsten per unit (GSA domestic)	\$128.05	\$130.00	\$127.44
Zinc per lb. (MW-US PW)	\$ 0.406	\$ 0.364	\$ 0.37

*Standard ton unit (20 lb)

Alaska Department of Natural Resources
Division of Geological & Geophysical Surveys
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