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William A. Egan - Governor Charles F. Herbert - Commissioner

William C. Fackler - State Geologist

IN THIS ISSUE

NASSIKAS PUSHES GASIFICATION

(The Mining Record)
November 29, 1972

Coal gasification represents the most important technological advance in developing substitute natural gas supplies, Federal Power Commission Chairman John N. Nassikas told the annual meeting of the Institute of Gas Technology in Chicago.

National security considerations and the economics of available alternatives dictate an accelerated research and development activity in coal gasification, he said.

Mr. Nassikas pointed out that coal gasification does not involve balance of trade problems. The natural resource base for the industry is more than adequate, he said, and the technology is on the threshold of commercial feasibility.

However, it is probable that the first commercial gasification plant will not be ready for more than five years because the growth of the coal gasification industry will be subject to a number of factors, he said. He included in these factors the rate at which coal will become available for gasification, cost of building gasification plants and supporting mining facilities and the environmental problems of locating the mine-plant complexes.

Mr. Nassikas also said that new increments of gas supply must be priced to induce the level of exploration and development necessary to meet demand.

The major measures for meeting America's future energy requirements should include a comprehensive energy policy that weighs all aspects of the national interest, a Department of Natural Resources and a Council on Energy Policy "under standards delegated by the Congress" to help coordinate the national energy policy, he said.

He also suggested a new Federal Energy Commission to consolidate regulatory functions and implement the policies of the Council, to "assure the optimum development of supplementary energy sources, consistent with the national security and energy policy considerations."

There must be regulatory certainty to assure that supplemental gas projects can be financed at a reasonable price to the consumer, Mr. Nassikas said. He added that because of the magnitude of the capital required, consortiums or joint ventures may be the necessary vehicle for securing finance.

Accordingly, he said, "the applicability of antitrust laws to such combinations must be scrutinized, and the overriding public interest, reliable and adequate gas supplies at the lowest reasonable price, must be the guiding standard."

COAL GASIFICATION
(Western Miner)
November, 1972

Excerpts from a paper presented by J. E. Williams to the 24th Canadian Conference on coal, September 20, 1972, and reprinted from Western Miner, November, 1972.

Coal gasification is not new and has been in use for well over 70 years. It, however, has not played a key role in the energy requirements of the U.S.A. Because of this, there is an aura of mystery surrounding the process.

In simple terms, coal gasification is the combination of coal and water to form carbon monoxide and hydrogen and, hopefully, some methane. This is not what you would call an "easy" reaction and both heat and elevated temperatures are required to get the water to break down into hydrogen and oxygen and for the carbon in the coal to react with the oxygen to form carbon monoxide.

Coal, heat, and water are required for the gasification reaction. They are the key items that you must have and in most cases the hardest one to come by will be water, since a minimum of about 1 and probably closer to 1 1/2-tons of water is required to gasify each ton of coal. Obviously, access to water near the source of coal will be a key factor in the logistics of any gasification project.

The other key point that I want to emphasize is that there are many ways of getting the heat required for these reactions into the system. I have listed four ways: combustion, electrical, chemical and nuclear. The most common is combustion. It is relatively simple since it requires only the injection of air or oxygen into the gasifier to get the procedure going. This is essentially the procedure that has been used in the coal gasification units that have been built to date. Currently, there is a lot of pilot-plant effort going on and the method of heat input is a major change that is being explored in all of these processes.

One very significant side reaction that occurs in gasification is the conversion of over 90% of the sulfur in the coal to hydrogen sulfide. This is a key point since there is proven technology for removing hydrogen sulfide from the coal gas and for converting it to elemental sulfur. Many years of operation doing just this are under the belts of the natural-gas industry; these techniques can equally well be applied to gas from coal.

At this point, I think it is wise to digress a little and answer a question which I am sure comes up time and time again - especially when talking to power and utility people. This question is - why go to all the trouble of gasifying coal - why not just burn it - generate steam and power and remove the SO_2 and particulates with a stack-scrubbing process? This is a legitimate question and my answer is

simply this: Stack scrubbing to remove SO_2 is just in its infancy and costs and problems associated with these processes are far from proven and solved. On the other hand, H_2S removal processes are proven and available and are capable of removing sulfur to much lower levels than any projected stack-scrubbing system.

Gasification also has another added benefit - it produces an ash-free fuel which avoids the particulate problems commonly associated with coal burning.

Now back to my coal gas. The effluent from the gasifier, the raw gas, is not a very appetizing mixture; typically about 20-25% carbon monoxide and 38-45% hydrogen, tars, oils, and miscellaneous other gases. It is at this point that the end use of the gas enters into the picture. If you are an electric utility, this is about as far as you have to go. Once the tars and oils and H_2S are removed, the gas is ready to use as a clean-fuel source in whatever type of power cycle you choose. Admittedly, it is a different fuel, but it meets the requirements - it has BTU's and it is clean.

One item that I have not mentioned before is the tar which results from most of the gasification processes. The amount is a function of the type of coal and the gasification process. It is very similar to coal tar, but it does have one significant difference: it has been desulfurized and typically the sulfur contents will be 50-75% lower than the coal from which it was made. Essentially, it is a low-sulfur oil that can be either burned or sold.

This gas I have described has a very low BTU content per cu. ft., about 130 to 300, which is far too lean a gas to pipeline all over the country to people who couldn't burn it when it got to their end of the pipeline. Furnaces designed for 900 to 1000 BTU gas just won't work on this low BTU gas.

Processes are available to convert this low BTU gas to pipeline quality - i.e. low CO content, high BTU content, and no water.

Up until this time, I've avoided talking about specific gasification processes. Now that the groundwork has been laid - we have to get down to specifics to find out who do you go to, to get a gasification process. The key point here is timing - if you want a gasification plant and want to start on it now, then there is only one choice - Lurgi. Lurgi is a German engineering firm which has participated in most, if not all, of the gasification projects that have been built during the last 30 years or so. The key point in Lurgi's expertise is its gasifiers. As I mentioned earlier the gasification process takes place under pressure and at high temperatures. This requires a very special piece of equipment to contain this reaction.

What about new technology? The key point here is timing. Many coal-gasification projects using new-process concepts are now at the pilot-plant stage. These pilot-plant efforts are typically the first step in a six- to eight-year development program which will be required to commercialize these processes.

Much of the current pilot-plant work is under the sponsorship of the U. S. Department of the Interior (OCR). And, without slighting any others, I have selected three processes which are currently at, or about to enter, the pilot-plant stage to illustrate where the current effort is going. These are the "BIGAS" process of Bituminous Coal Research (BCR), the "HYGAS" process of the Institute of Gas Technology, and the CO_2 ACCEPTOR Process of Consolidation Coal Company.

SUMMARY

The final comments that I want to leave with you are these:

Coal gasification will add anywhere from 0.35c per MMBTU to the cost of fuel. This looks like a fantastically-high cost especially to someone who is used to burning low-priced coal. The key point, however, is what it does for you and what the alternatives might be.

What it does for you is simple - it solves the ecological problems associated with burning coal by proven technology which can be put into use today. In addition, it does it at a price which is competitive with the low-sulfur fuels that many of the eastern utilities are burning.

The alternatives are not all that simple to evaluate: for instance, low-sulfur fuels have just about ceased to be available at reasonable prices - stack-scrubbing is not yet proved on a commercial scale - nuclear systems are admittedly on their way in; however, they cannot be installed fast enough to solve the immediate needs for clean energy.

Coal gasification, on the other hand, offers a competitive proven solution which can be installed quickly to solve the energy-ecology puzzle.

PRIVATE GOLD POSSESSION BAN MAY BE LIFTED

(The Mining Record)
November 29, 1972

The law which prohibits private possession of gold by American citizens should be repealed after international monetary reforms become effective. That is the recommendation made by the Joint Economic Committee's subcommittee on international exchange and payments.

The prohibition against the private possession of gold for any but ornamental or industrial purposes has existed since 1933, when the United States partially abandoned gold as the sole backing for its currency.

"As soon as the international monetary reform that is currently being negotiated is achieved, all prohibitions on the purchase, sale and holding of gold by American citizens should be promptly abolished," the subcommittee recommended.

Such a move, it said, would be a step "toward removing the mystique from gold and making it a commodity that is traded in the same manner as other metals."

The subcommittee called for reforms which would enhance the role of special drawing rights (SDR) in international monetary affairs and downgrade the role of gold.

Special drawing rights, commonly know as "paper gold," are on artificial reserve asset created in 1968 by the International Monetary Fund (IMF) and distributed to its members in proportion to their economic importance in the world economy. SCRs are used in the same fashion as gold, dollars or other currencies to settle debts between nations.

Under reforms now under discussion, the subcommittee said, SDRs should be acceptable in lieu of gold in all transactions between the IMF and its member countries."

The subcommittee called for continuing existing agreements under which the world's central banks are prohibited from purchasing gold in the free market or directly from South Africa.

But it said the current agreement committing the IMF to purchase gold from South Africa under specified conditions should be terminated when it expires in two years.

When reforms make SDRs the chief international reserve asset, the subcommittee said, gold will become just another metal with its value determined by the economics of mining and refining and the demand for artistic and industrial uses.

INFORMATION CIRCULARS UPDATED

Division Information Circulars 11 and 8, concerning Division publications and consultants available for work in Alaska, respectively, have been brought up to date

and are available free of charge at the Mining Information offices at College, Anchorage, Juneau, and Ketchikan.

NEW CIRCULAR

A new Information Circular, reassigned the number 7, has been issued by the Division. Listing Alaskan Mining Companies and Prospectors for 1973, it is available free of charge from the Mining Information offices.

MAN'S BEST FRIEND TO REPLACE HIM?

(Canadian Mining Journal)
November, 1972

By J. Stirling

The modern day Canadian Mining exploration industry and the dog are an unlikely pairing. However Syndicate K-9 is out to prove that four-footed prospectors may yet add a new dimension to the saying of a dog being man's best friend.

The Vancouver syndicate was formed in 1970 to test the theory that some dogs could be trained to such a degree of scent discernment that they could detect sulphide bearing rocks not normally indicated by conventional prospecting methods. The presence of glaciated-sulphide float material, when located and mapped, can point to the source of the mineralization and indicate areas of interest.

That is the theory proven in Finland, where the method was pioneered a decade ago, when a prospecting dog located some pyrite and chalcopyrite boulders which diamond drilling investigation revealed to have a copper orebody of economic significance.

The Canadian experience has been somewhat hesitant and so far less dramatic. It was hampered when an application for a $30,000 federal government research grant was refused. The money would have paid, for a year, wages for three assistants, kennel rentals, dog care and maintenance, transportation costs, and consultation with dog trainers in Finland. Interest from eastern Canadian mining companies has been expressed however, and the two Canadian prospecting dogs should be going through their paces for the companies this coming spring.

The grant was applied for by the Syndicate (consisting of Kennco, Falconbridge, El Paso, and Dynasty) because it felt research in the technique would benefit the mineral industry and should be supported by the Canadian government. The Syndicate has backed the project with $12,000 so far, but no more is expected from them for at least the remainder of the budgetary year.

Dr. Harry Warren, U.B.C.'s geology faculty introduced the dog prospecting idea to Canada. He stated, "the dogs have undoubtedly demonstrated their ability to determine sulphide-bearing boulders under reasonable conditions. We have retained faith in the project and work will go ahead." Dr. Warren heard of the Finnish Geological Society's interest in dog prospecting and reasoned that with the similarities in climate, topography, and geological backgrounds between the countries the idea held merit here. He initiated the project with Dr. Bob Wright recently retired from B. C. Research Council and an expert in scent detection, and had the financial backing of the mining companies. Rick and Jennifer Maynard were the dog trainers and received assistance from Sgt. Paul Campbell of the Vancouver police-dog squad.

Two German shepherd dogs were purchased; neither had any formal training. Because no one involved had any direct knowledge of the training methods of the Finns,

techniques, based on standard methods of teaching scent perception and tracking had to be developed. The dogs responded very well and within a few weeks were infallibly selecting sulphide-bearing boulders from amongst ordinary rocks. During the first six months the dogs learned to detect boulders at greater depths and could work in a regulated pattern within about 150 feet either side of their handler. The Finns claimed boulders covered with about three inches of overburden are guaranteed finds for their dogs and some have been located as deep as 90 inches. The training was based on kindness with verbal encouragement as rewards for finds, making the dog want to please the handler.

The dogs had extensive field training on properties owned by the Syndicate, ranging from Alaska to Vancouver Island. Often the dogs would find sulphide-bearing rocks where the prospector had not. Scientific experiments in Finland have shown that a dog trained over an 18-month period can uncover five times as many boulders either on or below the surface, five times faster than a human prospector using usual methods. They claim an eight-hour day from their dogs, effective for eight years.

In Canada, drawbacks surfaced. Extremes of humidity were found to be detrimental to the sense of smell especially in the low extremes when the dogs mucous membranes in the nose tended to dry up. It was found that the ground should be warmer than the air for good scenting conditions. Snow cover is apparently not harmful tending rather to trap SO_2 gases near the surface rather than disperse them. There were certain terrains the dogs could not work easily, like steep scree or talus slopes, although they were found to be effective around lichen-covered boulders of creek beds and in forested areas.

One of the major difficulties was maintaining the dogs interests when natural finds were slow. The dogs were not fooled by planted rocks designed to bolster their enthusiasm. They seemed to know the real thing.

ROCK MECHANICS CONGRESS

(Canadian Mining Journal)
November, 1972

The 3rd Congress of the International Society for Rock Mechanics will be held in Denver, Colorado, September 1-7, 1974. In addition to the week-long technical and social program, pre- and post-Congress tours are planned. Technical sessions will be organized around the following themes. Physical properties of intact rock and rock masses (general applications); surface working; underground openings; tectonophysics, and fragmentation systems.

General inquiries about the Congress should be sent to A. N. Bove, Executive Secretary, U. S. National Committee for Rock Mechanics, National Academy of Sciences, 2101 Constitution Avenue, N.W., Washington, D.C. 20418, U.S.A.

1972 U.S.G.S. AEROMAGNETIC SURVEY IN ALASKA

Negotiations are in progress with John Henderson of the USGS Geophysics Branch for possible distribution by the State of Alaska of the 1:63,360 aeromag maps of the 1972 USGS Alaska Survey. Areas covered include the Tanana quad, the west halves of Livengood, Beaver, and Chandalar quads, Wiseman A1, B1, C1, and D1, the east half of the Bettles quad and Bettles A4, Meldzitna A1, and in SE Alaska the Granite Fiords area.

BELDEN BUYS 50% INTEREST IN GENEVA-PACIFIC CORP.

CHICAGO, Nov. 30 -- Belden Corporation today exercised an option to purchase for an undisclosed amount of cash, a 50 percent interest in Geneva-Pacific Corp., previously a wholly-owned subsidiary of Cenco Incorporated. The remaining 50 percent is retained by Cenco.

The announcement was made by Robert W. Hawkinson, president of Chicago-based Belden, and Theodore W. Van Zelst, president of Geneva-Pacific, headquartered in Evanston, Ill.

Geneva-Pacific, a small three-year-old firm specializing in mineral exploration and property development, has property, leases and mining claims comprising approximately 14 square miles in the mountainous McCarthy District of southeastern Alaska. With state aid, the company has built 12 miles of road to transport ore shipments to connecting roads that reach Chitina and Glenallen, about 100 miles northeast of Anchorage.

The company made a test shipment of approximately 20,000 pounds of copper ore to a contract smelter earlier this year. The ore averaged 55.7 percent copper content. Geneva-Pacific expects to conduct exploratory mining operations on a limited scale when the weather breaks next spring. Beyond examination of surface outcroppings and existing mine tunnels, which show the presence of copper, the company has made no estimates of the ore reserves at this time. The company also is seeking to negotiate leases for development of mineral deposits elsewhere.

Serving on the new Board of Directors of Geneva-Pacific are: Hawkinson; Van Zelst, who also remains as president of Geneva-Pacific; Charles W. Hudon, senior vice president finance and secretary, Belden; and Edward E. Brush, executive vice president of Soiltest, Inc., a Cenco subsidiary.

Chicago-based Cenco has diversified operations, services and products in the medical and health fields, the hospital and convalescent markets, technology, pollution abatement, and education.

Belden manufactures wire, cable and cords for the electrical, electronic, transportation and consumer markets. It recently entered computer management services with acquisition of an 80 percent interest in Phoenix-Hecht Incorporated, Chicago.

BIBLIOGRAPHY ARRIVES

The Bibliography of Alaskan Geology, 1969-1971, compiled by Crawford E. Fritts, Elizabeth A. Zesiger, Ellen J. Tuell, and Mildred E. Brown, is now available from the Mining Information offices. There is a charge of $1 for these bibliographies.

REPRINTS AVAILABLE

Reprints of a speech presented at the Northwest Mining Association Convention by Mr. Gilbert R. Eakins, "Mineral Exploration in Alaska," is now available free of charge, from the College office of this Division.

NEW REPORTS ON ALASKAN GEOLOGY

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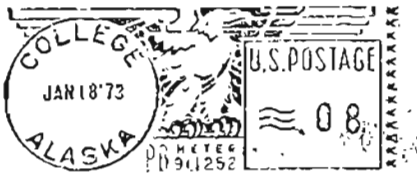
METAL MARKET

Metals	Jan. 1, 1973	Month Ago	Year Ago
Antimony ore, stu equivalent, European ore	$7.60-8.60	$7.35-8.35	$8.64-10.00
Barite (drilling mud grade per ton)	$18-22	$18-22	$18-22
Beryllium powder, 98%, per lb.	$54-66	$54-66	$54-66
Chrome ore per long ton	$24-27	$24-27	$31-35
Copper per lb.	50.6¢	50.6¢	53.1¢
Gold per oz.	$65.01	$62.35	$37.70
Lead per lb.	14.5¢	14.5¢	13.5¢
Mercury per 76# flask	$288	$255	$350-375
Molybdenum conc. per lb.	$1.72	$1.72	$1.72
Nickel per lb.	$1.53	$1.53	$1.33
Platinum per oz.	$141.75	$141.62	$122-125
Silver, New York, per oz.	204¢	181¢	162.0¢
Tin per lb.	177.75¢	177.25¢	160.5¢
Titanium ore per ton (Ilmenite)	$22-24	$30-35	$30-35
Tungsten per unit	$55.00	$55.00	$55.00
Zinc per lb.	18.32¢	18.0¢	15.0¢

State of Alaska
Department of Natural Resources
Division of Geological Survey
P. O. Box 80007
College, Alaska 99701



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