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Analysis of Beluga lease sale and coal exports (1982)

By

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ATTACHMENT A

General Notes and Comments Bearing on the Beluga Coal Lease Sale

1. The Susitna Lowland, which contains within its confines the proposed lease sale areas, undoubtedly holds the greatest near-term potential for large-scale coal surface mining in the state. This has been dramatically illustrated in recent years by the intense interest of industry in the region.
2. Overall, the Susitna Lowland could be termed a "sleeper" with perhaps more potential than anyone can anticipate at this time. Indeed, it could be the most significant, single, undeveloped coal "property" in the United States.
3. Two of the most favorable factors relating to the area is its proximity to coastal access and the existing Alaska Railroad.
4. The so-oft cited "infrastructure" can reasonably be addressed, and without many of the usual attendant negative side-effects, by simply constructing offshoot rail spurs to planned development sites. The level of reserves are sufficient to permit this construction.
5. Geologically speaking, we know that most of the reserves of the Susitna Lowland are concentrated in a crescent-shaped belt along the western and southern margins of the Susitna Lowland. The southern part of the region includes the proposed lease sale areas.
6. The proposed sale tracts lie adjacent to existing leaseholdings in the southern Susitna Lowland. By way of comparison, mineable reserves for the Threemile lease have been estimated at 60 million tons, the Chuitna at 200 million tons, and the Capps at 200 million tons. Although a firm determination as to the reserves on the proposed sale tracts cannot be made at this time, it is estimated that it should not exceed the amount present in either the Capps or Chuitna field, and most likely would be closer to the reserves of the Threemile lease, i.e., approximately 50 to 75 million tons. This is based on the distribution and outcrop pattern of the coal-bearing formations, known structure, and the scarce subsurface information available.
7. We know that in the adjacent leased tracts, there exist at many locations multiple relatively thick (10 ft. or greater) coal seams beneath a shallow overburden cover. The geologic structure is relatively uncomplicated with slightly dipping to near-horizontal coal beds.
8. These coal beds are of comparable quality with those in the Powder River Basin of the western United States.
9. In comparing hypothetical tracts in the Appalachian, Eastern Interior, Powder River Basin, and southern Susitna Lowland, the Alaskan sites would appear to have fewer mining related problems than would occur at

the other locations. Specifically, such factors as material handling, overburden quality, physical and geochemical spoil problems, and hydrogeochemical problems. Results of geologic and geochemical research on the coals and overburdens of this region bear this out.

10. The importance of the existent extremely low sulfur contents of the materials cannot be overemphasized. This will preclude many environmental problems normally associated with mining and utilizing coals from other regions.
11. The serious acid conditions associated with many eastern and midwestern U.S. coal mine operations and the high levels of soluble salts and adsorbed sodium common at many western U.S. coal mines should not be a significant problem in south-central Alaska. Thus, conscientious and well-designed reclamation programs should be very successful. The inherently low levels of pyrite, gypsum, and dolomite and relatively low clay/sand ratios (vis-à-vis, clay mineral contents) within the overburden rocks, and which typically have the greatest effect on the chemical nature of groundwater (and result in increased mineralization if in abundance), allow one to project that there should be no significant impacts to the regional groundwater quality when mining is initiated. Sulfate (SO_4) and sodium (Na) concentrations should not significantly increase over premining levels in either subsurface aquifers or surface streams.
12. Some of the lease tracts in this region have had an intensive amount of baseline data and resource inventory work completed by the individual leaseholders over many years. By the development stages of any adjacent tracts, should it develop to such a point, this information would be available on which to base future decisions. Of course, this puts the current leaseholders in a position to develop their coal reserves in a sound manner; they will better know what the problems are and how to deal with them.
13. The state should take an active role in monitoring mine sites and utilizing the expertise it has to assure that the mining and reclamation is done right. DGGs, as a geological and geophysical data gathering and disseminating agency of the state, can be supportive of the Division of Minerals and Energy Management in their efforts to regulate coal mining in this area, and insure that the coal is extracted with due regard for the unique Alaskan environment. It is anticipated that DGGs research programs in coal geology and related practical applications will increase to meet the need when surface mining becomes firmly established within the region.
14. It appears that offering these adjacent tracts in the coal lease sale would be a reasonable course of action, and one in which we could gauge the true interest of industry in future coal lease sales in other areas of the state.

ATTACHMENT B

Direct or Indirect Positive Benefits Accruing From Beluga
Coal Lease Sale and Future Coal Development Within Region

1. Development of parallel growth industries. Diversification of industries within the state.
2. Employment of Alaskans directly increasing as additional mines are brought on-line and production levels peak. Employment should be stable since large-scale mines are generally long-term endeavors, planned for a minimum of 20 years, and typically 30 years or more.
3. Improved relations of state with industry who want to develop these coal resources.
4. Increased infrastructure within region can be utilized efficiently for multi-resource development.
5. Increase tax base of state and increase state revenue.
6. Harbor development and ship-loading facilities could spur creation of export market for Alaskan agricultural products. Result in productive trade economy between Pacific-rim nations and Alaska. Coal can be exported and products needed in Alaska can be imported on return trips.
7. Provide a stable fuel base for local, regional, national (particularly west coast of U.S.), and international coal supplies. Result in improved relations with far eastern countries, and permit them to diversify sources of supply.
8. Lead ultimately to lower electric costs with development of mine-mouth power plants at appropriate locations.
9. Improvement in rail and other land-base transportation systems as new industry level supports it.
10. Positive and supportive stance by state toward coal development within region would be fully within the overall stated policy goals of U.S. government. Development would be looked on favorably by federal and most state governments.
11. Opportunity to be on leading-edge of new developing technologies for coal liquefaction and gasification at on-site facilities close to base raw materials. Options such as coal/oil mixtures and methanol plants are other alternatives which can be brought into play.
12. Development of new mining and reclamation technologies. In many cases, the overall quality of mined lands can actually be improved during reclamation producing favorable post-mining land-use options

such as agriculture, silviculture, wildlife habitat or fisheries, and industrial or residential sites. The soil structure and plant nutrients can be improved over pre-mining conditions, landscapes can be levelled or gently sloped for farming or industrial sites, and lakes or parks can be designed which would fit in easily with overall reclamation schedules and objectives. In this manner, the lands would be used to their highest potentials---mining to extract needed mineral and energy resources first, and followed subsequently by the next highest land-use priority.

13. Ultimately will show concerned citizens that mining can be conducted in an environmentally sound manner, and compatible with and protective of natural land quality values and other resources.
14. Possibly have a more dependable labor force than in other mining regions due to relative isolated situation of coal fields within the state and also due to the typically higher standard of living of Alaskan residents. Here, one could cite the existing situation at the Usibelli Coal Mine as an example.
15. Although some of the coals are low subbituminous to marginal lignitic, their strategic location near higher quality coals within the same physiographic region offer excellent situations for developing mines in other areas. The higher quality coals can be blended with and bring the lower quality coals up to standard requirements. The bituminous and anthracite coals from the Matanuska and Bering River coal fields would be ideal for this.

ATTACHMENT C

Review:

PRELIMINARY ANALYSIS OF THE DIRECTOR [DMEM] REGARDING PROPOSED BELUGA COAL LEASE SALE

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
1	1	"moderate to high coal potential"	Reference DGGS memoranda and/or AOF-142
4	1	"Alaska contains enormous quantities of coal in three sedimentary basins..."	"Alaska contains enormous quantities of coal chiefly concentrated in three major regions."
4	2	"coal...has been tested for use in Korea."	Should be updated to reflect existing contract which Usibelli now has.
4	3	"Coal in the Matanuska Valley...has been mined since 1914."	"...has been mined intermittently since 1914, but last operated in 1967."
6	1	"...and the explored lands with commercial coal reserves are now under state leases issued in the 1970's."	"and parcels of the explored lands with..."
6	4	"This proposed lease sale will be the fifth..."	"This proposed lease sale (if carried forth) will be the fifth..."
9	1	DMEM solicited comments	DGGS should be referenced among state agencies solicited
11	3	"This proposed mine is on Lone Ridge..."	Lone Ridge consists of granite. Needs rephrased, i.e., the Lone Ridge Mine.

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
13	2	"...soils are destroyed..."	Soil horizons are actually stripped off ' and selectively handled to be later spread over the regraded cast overburden. Often with reconstruction, soil textures are improved and nutrient levels can be enhanced.
13	2	"...wildlife is displaced..."	"...wildlife may be displaced..."
13	2	"...air quality is degraded..."	"...air quality may be degraded..."
13	2	"...current land uses are altered..."	"...current land uses are temporarily altered..." However, lands can often be improved for a designated post-mining land use option.
13	2	"...the general topography is permanently changed..."	"...the general topography may be permanently changed..." and often by design.
13	2	"...aquifers are destroyed or contaminated..."	"...aquifers may be displaced or contaminated..."
13	2	"...surface and groundwater flows are altered."	"...surface and groundwater flows may be altered."
13	2	"The surface is dedicated to mining until mining is complete and the disturbed area can be reshaped and reclaimed."	One should point out here that only the local area mined is disturbed at any given time.

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
16	1	Pollutants---acid and trace metals.	The sulfur contents of both coals and overburdens are extremely low in this region. The levels of certain trace metals (Bo, Cu, Pb, Zn, Mo, Ni, and Cd) will need to be monitored. The pH or acid-base balance of water systems should not be affected. There will not be "dramatic biological repercussions."
16	1	"Trace metals, which are often toxic, can also be exposed by surface mining."	"Trace metals, which may be toxic to certain plants, can be incorporated into subsoil root media, resulting in revegetation problems."
16	1	"In Alaska, iron and manganese will probably be the two metals most likely to cause problems for surface mine development."	Reference
16	1	Incorporation of nitrogenous compounds in spoil piles from blasting of overburden.	Cite reference and give specific example where this has resulted in toxicity problem.
18	1	"Species with small home ranges or limited mobility, such as beaver, muskrat, and small rodents, will be destroyed..."	"Species" will not be destroyed but individual animals might. However, most of the beavers, muskrats, and small rodents I have seen (none within the proposed sale areas) are rather "fleet of foot."
18	1	"If streams are within the mine, salmon and other fish will be destroyed when streams are diverted."	No indication that any stream serving as a spawning ground would be diverted in any mine plan. Most likely would leave buffer adjacent to such streams.

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
18	2	"Surface mines can cover many acres. For example, the five proposed Beluga area mines will strip a total of 8,400 acres over 40 years."	Reference. Also state that only a very small fraction of this area will be disturbed at any one time.
18	2	"If lands adjacent to the proposed sale area are already at their carrying capacity for a particular species, overcrowding could result. Overcrowding could cause habitat degradation, reduced reproductive success, and increased competition."	Are there firm population figures of AF & G which could be presented to support the view that overcrowding is or would be a legitimate problem?
20	1	"Once destroyed, spawning grounds can be replaced only with difficulty..."	No indication that any spawning ground will be destroyed.
20	1	"...groundwater input prevents stream-bottoms, therefore salmon eggs, from freezing."	This seems to say that salmon spawn while streams are still frozen.
20	2	"Lone Creek, Middle Creek, and Scarp Creek contain salmon spawning habitat..."	Mine plans should not require mining through or diverting any major stream serving as a spawning ground.
21	2	"Many years may elapse, however, before moose can re-occupy the area where mining began."	"A few years..." Many wild animals are inherently curious about mining or other activity. In some areas, they thrive in near proximity to mining operations. Look at the dall sheep population at Healy. Also, improvement of moose browse has been documented in some placered areas.
21	3	"However, suitable habitats may already be saturated with moose."	Is there any evidence that this is the case? Reference.

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
23	4	"Displaced bears could be restricted in their search for new habitats by regional morphology."	Their range is not so restricted as indicated. Surely, they can find a temporary new home in 8,000 mi ² or more, somewhere in the Susitna Lowland.
24	3	"Rehabilitation of wetlands could be difficult..."	Define "wetland" for readers. Are there indications that any would be disturbed by future mining?
24	4	"....Bald Eagle populations are probably low..."	Can you be more definitive? Are they "low" or "probably low"?
27	3	"A surface coal mine in the proposed sale area could impact Tyonek subsistence and commercial salmon fisheries by destroying salmon spawning habitat."	No indication whatsoever that salmon spawning habitat will be destroyed. Need to present evidence that this would be so.
28	2	Tyonek subsistence	The actual relation with Tyonek subsistence should be more accurately ascertained if a developmental city was built nearby or a road connection made to Anchorage.
30	2	"Coal mine development will double or triple the number of permanent area residents, however, and harvest pressure on moose may increase dramatically."	Does this assume that the new population will qualify for subsistence, or assume illegal poaching or what? Will not the Alaska Fish & Game Department regulate the size of harvest?

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
32	1	"While many Tyoneks want jobs from coal development, the recent timber chip mill experience suggests that few Tyoneks would successfully maintain coal-related jobs...Although some Tyoneks have skills which could be employed in coal mine construction, similar problems will probably arise, and few Tyoneks will benefit from increased employment as a result of this proposed sale."	This is a broad assumption, and one I would delete. Admitting that many have useful skills which could be adapted for mine construction, it follows that perhaps the Tyoneks will make better coal miners than timber chip mill workers.
33	1	"If surface coal mines are developed as a result of this proposed sale, Tyonek well-being will be negatively impacted by interference with subsistence."	Has this been confirmed by someone in a position to know?
33	2	"...will probably be exacerbated by coal development..."	Will probably be what?
34	3	"...to preserve archeological, geological, and biological resources."	What geological resources are referred to here? Coal, fossils, geomorphologic features? Perhaps these should be defined.
37	3	"Capital move to Willow"	Strike out!
46	3	"Exploration facilities will be temporary and not constructed of gravel."	Gravel---do you mean cement or what?
47	2	"...preserve...geological...resources."	Ditto from above.
51,58	--	-----	F.F. Barnes' geologic report, AOF-142, and continuing work of Roy Merritt at DCCS should be cited and/or included in additional references.

ATTACHMENT D

Review:

PROSPECTS FOR ALASKAN COAL EXPORTS

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
2	2	"Unlike the federal government, which has a core sampling program, the state will be leasing land of unknown reserves."	A core sampling program does not necessarily define reserves. Although the U.S.G.S. and U.S. Bureau of Mines may conduct limited exploration drilling (as the two holes in the Capps Field by the U.S.G.S.) they normally cannot drill enough to define reserves accurately. There is no way the State could accurately define the reserves on its lands. A few holes can and perhaps should be drilled to make better estimations.
9	3	"Placer Annex"	"Placer Amex"
10	2	"Present market potential for Alaskan coal is definite but receded from the outlook of 1980."	We should not view the energy outlook and markets with such a short-term perspective.
17	2	Btu/inert matter	There is not always a direct relationship here.
29	1	"Underground mining still affords deep mining and some measure of coal selectivity."	What?
29	4	"...Capps area, the Waterfall seam,..."	"...Capps area (the Waterfall and Capps seams)..."

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
30	2	Multiple seam development by Diamond Shamrock. "Multiple seam development becomes necessary when the first seam alone does not justify a mine opening..."	There are at least six near-surface seams with large reserves on this lease. Since the state is responsible for coal conservation (as per statute), then adequate mining plans should call for the extraction of as much of the coal resource as technologically feasible at one time to avoid redisturbance in the future.
35	3	"Further, Battelle's 1980 finding that Beluga coal was competitive with and occasionally superior to other coals has not been borne out."	Is this an opinion? Cite a reference to justify this conclusion.
38	3	"Battelle...suggests the quality factor is insignificant. This conclusion is unsatisfactory..."	Another opinion?
39	1	"...Alaska's high moisture coal...presents spontaneous combustion problems."	Benno Patsch stated at the last Coal Task Force meeting in Anchorage (October 28) that a 1,200 ton bulk sample passed the long term storage tests of the Japanese and did not spontaneously combust. Also Bob Stiles at the AMA convention cited evidence that Beluga coals are not particularly prone to spontaneous combustion.
39	1	"But dewatering technologies for sub-bituminous coals are largely unavailable."	Reference this. Did you consult P.D. Rao on this? He is currently working on the drying characteristics of such low-rank Alaskan coals.

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
39	2	"...the coal would reabsorb moisture in transit..."	Would this be significant? I would think not. Reference.
39	2	Moisture reabsorption. "Unfortunately this assumption is the lynchpin of Battelle's analysis and invalidates their specifications for dried Chuitna coal and ocean transport costs."	I think that moisture reabsorption would be minor. Also it seems that cargo holds could be equipped so as to prevent this. I certainly do not agree that this factor should preclude ocean transport of "dried" Chuitna coal.
39	2	"Diamond Shamrock now suggests that their Beluga coals are of higher Btu content than previously thought and are usable as is."	I agree. I think moisture, ash, and Btu contents are probably more favorable than once believed.
39	3	"Conflicting reports by Usibelli and DGCS as to the outcome of these tests and repeated postponements by the Koreans are indicative."	Who reported what at DGCS? How does it conflict? Why bring this out to begin with? Are indicative of what? We do not want to be brought out as conflicting with Usibelli. As far as I know, the contract is going ahead as planned. However, we have no inside information on this, and only know what we read in the newspapers.
40	1	"However, no Asian country maintains comparable sulfur emission standards and low sulfur, though a selling point, does not command the premium found in the U.S."	Reference needed here. I think that the sulfur contents will assume greater importance to them in the future.

<u>Page</u>	<u>Paragraph</u>	<u>As Stated</u>	<u>Suggested Change/Comment</u>
40	3	"Until utilization technologies advance and nations such as Japan design plants specifically for Beluga coal Alaska will not export to the Pacific Rim."	Too broad an assumption, including all Alaskan coals. Some high-grade coals exist in Alaska, i.e., Matanuska and Bering River. Beluga may not and does not affect Usibelli coal, e.g. Also broad inference and judgement call based on current conditions. Needs rephrased and pointed out that this is an opinion.
41	2	"The probability of Beluga coal exports on or before 1990 is less than even..."	It takes a long time to develop a large-scale surface mine.
41	3	"The year of initial production can also be approached with scenarios. Two commencement years are recommended."	I would recommend allotting more than two years to bring production on line.
43	1	"Postponement of the lease sale to ascertain reserves is one option for eliminating that uncertainty."	We cannot determine the reserves accurately on the state's coal lands without an undue amount of drilling. Perhaps we should selectively bore a few holes on prime parcels to give better estimations.