NORTH DAKOTA PUBLIC SERVICE COMMISSION
CENTENNIAL EXHIBIT
12th Floor, State Capitol
Bismarck, North Dakota 58505

EVOLUTION OF LIGNITE MINING IN NORTH DAKOTA 1889-1989

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Lignite, North Dakota's low-rank coal, has been very important to the State and its people. Use of the State's bountiful supply was common long before Statehood. There are indications that the Native Americans used it to some extent. The early settlers probably could not have survived the harsh winters without it. Settlers coming to heavily forested parts of the country had ample wood for heating their homes, but those hardy souls venturing west of Minnesota out onto the Plains did not have that resource, and dried buffalo chips and twisted hay were not adequate substitutes. Wherever there was a coal seam outcropping along a stream bank, the Dakota settler knew he could dig enough lignite to keep his family warm during the bitterly cold winters.

Dakota Territory's mining industry began about 1873, and was characterized by both one-man operations as well as a number of larger commercial mines. Most of them were located along the railroads and the rivers so that the coal could be cheaply and easily moved to market. There were 73 known mines operating in the period between 1873 and 1900.

The railway companies obtained enormous amounts of land in Dakota Territory as a part of the arrangement with Congress to build railroads after the Civil War. They were anxious to promote settlement of the land, which would in turn generate profits through increased rail traffic, and so they began an intensive publicity campaign to promote sale of their lands. They produced hundreds of publications of all kinds, describing the many virtues of Dakota, including its rich soil, its moderate climate and its extensive, easily accessible lignite deposits. All of these virtues, and others, were successful in touching off a great deal of economic activity.

Even in those days, Montana coal offered lignite severe competition. The Northern Pacific Railroad had its own mine near Sims, southwest of New Salem, but it closed in 1887 after only five years of operation because hard coal from eastern Montana was preferred to lignite for locomotive boiler fuel. Perhaps to counter this, the Legislature passed a measure in 1891 providing for the use of lignite in State institutions.

The coal industry used both surface and underground mining methods in the early days. As the mines got larger and as better equipment became available, surface mining gradually displaced the underground methods and by the 1960s the switch to surface mining was virtually complete. Surface mining was safer and the coal could be produced at lower cost.

Early mining equipment was quite small in comparison to today's mammoth equipment. Machines used to remove the soil over the coal in early operations usually had buckets of less than 10 cubic yards and coal loading shovels had buckets of less than 5 cubic yards of capacity. The surface mining era of the 1930s through the 1970s saw the capacities of this mining equipment go up to the present 100 plus cubic yard draglines. Coal hauling units have progressed from the team of horses and wagon to small transportation trains to 20 ton coal haulers to present day 160 plus ton coal hauling units. The power source for the mining operations at the turn of the century was steam, which gave way to the electrical power used today in most of the mining equipment. The transportation of the unprocessed coal from the open pits to the processing plants is done with diesel or diesel/electric coal haulers. Today the reclamation laws require the removal of large quantities of topsoil and subsoil ahead of the mining and its respreading after the mining and grading are complete. This is accomplished with the use of large scrapers, usually of 30 to 40 cubic yard capacity.

Lignite production increased dramatically in the 1960s when Rural Electric Cooperatives committed themselves to long-term coal contracts for lignite-fueled mine mouth power plants. Then came the national reaction to the Arab oil embargoes of the 1970s, which resulted in a second round of power plant construction in North Dakota, the opening of new mines and the enlarging of existing ones, and eventually the construction of a plant to convert lignite to pipeline quality substitute natural gas.

Today, with in-State ownership of the gasification plant and the promise of abundant and varied co-products from it, and the potential demand for methanol as an alternate motor fuel, North Dakota may be on the threshold of yet another resurgence in the use of its most abundant fuel resource.

The evolution of mining in North Dakota is illustrated by the pictures on display in the reception area of the Public Service Commission as follows:

> On the left is a commercial surface operation near Garrison using steam powered shovels, and a dragline to remove overburden and dig out the coal. Wagons drawn by horses or mules were used to remove the coal from the open pit.
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> The next photos show typical underground private and commercial coal mining and a typical small surface operation that probably served a very small area or private needs.
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> The next group of photos shows the larger stripping operations of the Truax-Traer Coal Mining Company at its Wilton, Velva and Hazen operations.
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> The next pictures show two unique excavators used in the past and the entrance to a large underground mine.
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> The color photos illustrate today's comprehensive surface mining requirements, which include returning the mined land to its premining or higher use. The equipment is 5 to 10 times larger than that commonly used up to the 1960's.

The map of North Dakota shows the location of the active and recently active lignite operations. The State's lignite production from 1920 to mid 1988 is also on the map.

The models on the table are at a 1:50 scale except for the dragline, which is at a scale of 1:64. Imagine the actual machine being 50 or more times larger! However, these are not models of the largest machines used. The dragline, illustrated by the model, has a capacity of 16 cubic yards compared to the one of 105 cubic yards shown in the large photograph.

The carbide lamp (to be put on miners' hats), the hand auger and the explosives hand tamping bar are typical tools used by the early underground miners in North Dakota.

Located in the Commission Hearing Room is a photographic exhibit depicting reclaimed wetland at the Falkirk Mine. This reclamation effort was recognized for an "Excellence in Surface Mining Award" by the United States Department of the Interior.