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The Burlington Northern Mineral Exploration Program

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ABSTRACT

The Burlington Northern (BN) railroad had extensive land holdings in the Northern Great Plains and the Pacific Northwest in the 1970s and 1980s. These lands were managed to provide revenue for the company and one of the ways this occurred was to develop the mineral resources. The company maintained a small mineral exploration program which was designed to find and bring a prospect up to the development stage.

The large land position gave the company (i.e., BN) a different perspective than that of the typical exploration company. BN preferred to lease the prospect to a larger mining company that had the resources and capability to develop and operate a mine and was happy to collect a royalty. This gave BN a different corporate culture than that of a mineral or geothermal exploration company. The perspective and corporate culture of BN was similar to that of other railroads and large timber companies that had large land holdings.

Introduction

Geothermal exploration involves both technical aspects (e.g., interpreting geochemical data from hot springs) and management aspects. One important management aspect involves obtaining leases for exploration on both Federal land and private land. Obtaining these leases can be a complex process because both Federal land and private land is present in the Washington Cascades and elsewhere in the Western United States. Among the large private landowners are timber companies (e.g., Weyerhaeuser and Plum Creek Timber Co.). The Burlington Northern Railroad Company and one of its successor companies, Burlington Resources, was a large landowner during the 1970s and 1980s and 1990s.

Exploration is a complex and expensive process (Mase Westpac Ltd, 1990). The initial phases of exploration (e.g., planning,

field checking, and/or target appraisal) were less costly but had a higher risk of failure (i.e., of not finding anything) (Mase Westpac Ltd., 1990). The cost of defining an orebody and developing a mine have a much lower risk of not succeeding but are much more expensive (Mase Westpac Ltd, 1990). Part of defining an orebody involves obtaining leases to cover the area and protect the interest of the company developing it.

Only a few of the largest mining (or geothermal) companies are able to finance the exploration and development process from start to finish (i.e., from the initial exploration stage to the start of production of a new mine) (Lew Katz, 2010, verbal communication). The smaller companies do not have sufficient finances and so either will bring in partners to share some of the risk, or else concentrate their exploration activity on the early stages in which they can use geological expertise and other technical abilities rather than spend a large amount of money (for example, on drilling to determine the amount of reserves). Once a target has been identified, the smaller companies will try to lease it to a company that has the ability to conduct the development and operate the property. BN followed this latter practice.

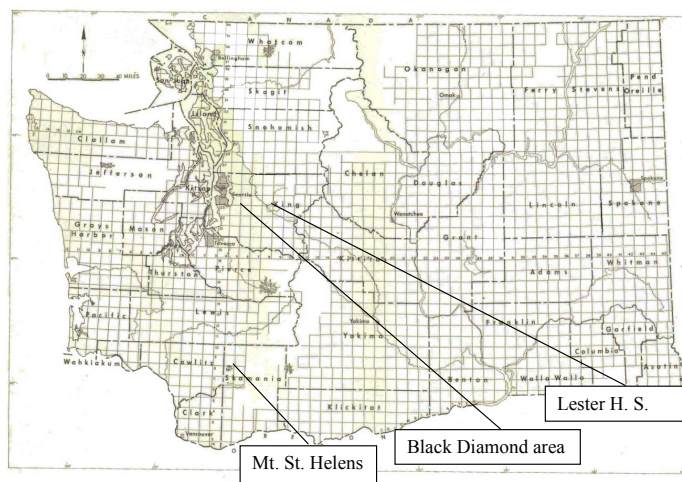


Figure 1. Map showing township and range for Washington and some of the locations described in article.

One reason for writing this paper is to provide background understanding for geothermal explorationists who are dealing with BN Santa Fe or one of the other railroads or with the timber companies (e.g., Weyerhaeuser). The railroads and other large land owners do not operate in the same way that geothermal exploration companies operate or the Federal Government operates. The large private landowners tend to be very bureaucratic organizations because they have to satisfy many different internal groups and so were slow to respond to requests for leases while the latter are typically quick to work out a lease and often use a standard format. For example, when the BN timber department (now Plum Creek Timber Company) wanted to do a land exchange with the Forest Service, the Energy and Minerals Department had to sign off on the exchange. Getting multiple groups with different interests to sign off was time-consuming. The large private landowners also want to be make a profit from any leases.

Location and Effect of Land Ownership

The BN Railroad owned approximately two and one-half million acres (2 1/2 million acres) of fee land (i.e., the ownership included both surface and mineral rights) and approximately six and one-half million acres (6 1/2 million acres of mineral ownership) (Burlington Northern, undated) in the 1970s and 1980s and 1990s. This land was spread from Wisconsin to the Pacific Coast, with most of the land being in Minnesota, North Dakota, Montana and Washington, although some land and/or mineral ownership was in South Dakota, Wyoming, Idaho, and Oregon.

History of BN land ownership—The history of the land ownership of BN's lands was complex and related to how the individual railroad obtained its land. The largest amount of land was the remnants of the Federal land grant to the Northern Pacific Railroad (Burlington Northern, undated). At first, when the Northern Pacific sold its land, it sold both the surface and mineral rights. However, when the Federal Government started reserving mineral rights, then the Northern Pacific did also. Some of the reservations of mineral rights were specific to certain minerals (e.g., coal and/or iron) while other reservations were for all minerals.

In addition to Northern Pacific land grant, some of the BN land came from the Great Northern Railroad and some came from the Chicago, Burlington and Quincy Railroad. These lands were acquired through either land grants or by purchase. For example, the Great Northern had to purchase a timber company in Northern Minnesota to obtain a right-of-way to Duluth. The lands included in this purchase were later found to contain high grade iron ore.

Later additions of land occurred when BN merged with the Santa Fe Railroad in the 1980s after the author had left the company. The latter railroad brought with them some blocks of land grant lands in Arizona and New Mexico (Vice, 1979).

It should be noted that the land under the railroad tracks was managed separately from that of the rest of the BN mineral estate and surface lands. The person handling any request for a lease would do so as a side job

which would take time away from his main responsibility. Thus, someone wanting to lease this land from the railroad may have trouble locating who to deal with and there may be a constant turnover in personnel.

Current status—The Energy and Minerals department was separated from the railroad in 1988 and became part of Burlington Resources (Jensen et al., 1995), which was a holding company managing the timber and mineral resources of BN. BN spun off Plum Creek Timber Company as a separate entity in 1989 (Jensen et al., 1995). Burlington Resources has since been bought by ConocoPhillips and has ceased to exist as a distinct company. After the purchase, the mineral lands were split with a group in Arizona managing the coal lands, ConocoPhillips taking the oil and gas mineral rights, and Plum Creek taking all of the mineral rights from the Rocky Mountains to the west coast (Hank Reed, 2010, email communication).

A explorationist wanting to lease geothermal rights from Plum Creek or one of the other timber companies can still do so. However, it will take more time and effort to finalize a deal than an equivalent lease from other private landowners or from the Federal Government. As stated above, such a deal would be structured so that the timber company would not have to contribute any money.

Exploration Program

The Northern Pacific Railroad and its successor, the BN Railroad, maintained a small minerals exploration department



Figure 2. Area photo of the Lester Hot Springs where BN did some exploration work (Vice, 2008).

of geologists, mining engineers, and support staff to oversee any mining leases and to conduct mineral exploration on its lands. The BN exploration program was operated like the program of a junior company on the Vancouver Stock Exchange or like the Federal Government.

The author joined BN in 1971 and managed the BN geothermal program from 1974 to 1982. He conducted geothermal exploration from 1974 until 1982 primarily in the Washington Cascades, including around Mt. St. Helens, because the company had extensive land ownership in the Cascades. The Lester area (Figure 2) in the Washington Cascades is one area that BN did some exploration work (Vice, 2008). The Black Diamond area of King County, Washington, was another area that BN did some exploration work, including the drilling of three two-thousand foot temperature gradient wells. Figure 3 shows one of the tem-

perature gradient wells being drilled in the Black Diamond area (Vice, 2010).

The purpose of BN's exploration program was to find a prospect which would then be leased to another company to do all the development work up to and including the construction of a power plant (WESTEC Services, Inc., 1986). In this respect, BN took a passive position, much like the Federal Government, or a junior mining company on the Vancouver Stock Exchange. Any deal was structured so that the railroad would not need to contribute any money toward the development. This method avoided the most costly stages of mine development (i.e., orebody development and mine development) (Mase Westpac Limited, 1990, chapter 2, p. 23). BN was satisfied to take a passive role and receive royalty income (WESTEC Services, Inc., 1986) like a junior exploration company on the Vancouver stock exchange.

However, the above method of operation was very different from what most geologists working for mining companies or geothermal exploration and development companies were used to. The author has heard a number of complaints about the railroads being difficult to work with or that they were not interested in making deals or that it was difficult to know with whom to deal. Part of this misunderstanding was due to the different corporate cultures of the exploration companies compared to that of the land companies, e.g., BN or Weyerhaeuser, etc. This difference can lead to misunderstandings and turmoil (McDermott, 2011, email communication). One of the results of the different corporate cultures is that negotiating a lease will take a much longer time than most geothermal explorationists are used to.

Conclusions

BN maintained a small mineral exploration department to explore for potential mineral deposits that could be sold to a mining company for development. The company preferred to do the early stages of exploration which had a greater risk of not finding anything but did not cost as much as the later stages. In this respect, BN and many of the timber companies like Weyerhaeuser were like the junior mining companies on the Vancouver stock exchange or the Federal Government. They would lease the land under the most favorable terms they could get and then let their partner make all of the development expenditures. The company (i.e., BN) was content to take a royalty rather than get involved in development expenditures. It is still possible to obtain leases for geothermal rights from Plum Creek Timber Company, but any deal would be structured so that the company would not contribute any money. It would take more time and effort to finalize the deal than it would with most landowners.

Many of the large landowners like the railroads and major timber companies operate in a different manner than that of a typical geothermal or mining exploration and development company. These different company cultures often lead to misunderstandings.

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Figure 3. Photo of temperature gradient drilling in the Black Diamond area (Vice, 2010).

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