The "Economics" of the Proposed Otter Creek Coal Mine:
A Critique of One-Sided Economic Analysis

Kestrel Aerial Services, Inc.

A Report Prepared for the

National Wildlife Federation,
Montana Environmental Information Center and
Sierra Club

by
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January 2013

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Executive Summary

i. Good Economic Analysis Weighs Both Benefits and Costs

The Bureau of Business and Economic Research's (BBER) analysis of the *economic impacts* of the proposed Otter Creek coal mine focused exclusively on perceived benefits. It should be clear that something is missing from that type of public-relations-based, benefits-only, analysis*,* namely the weighing of benefits and costs and the making of rational choices. If there were only benefits and no costs associated with a proposed project, there would be no controversy about the proposal. It is *because* there are perceived costs (as well as benefits) that public controversy emerges. In that setting any economic analysis worthy of that label should attempt to weigh the benefits and costs in a way that contributes to a rational public decision.

A new coal mine and a railroad to serve it will certainly have external costs associated with it that will burden the public. The point of emphasizing these costs is not to suggest that there are *only* costs associated with the proposed mine, but, rather, to make sure *all* benefits *and* costs are considered as they should be in any comprehensive and rational economic decision-making process.

Coal and other mineral companies are always weighing benefits and costs as they make decisions about which mineral deposits to develop and which mineral deposits to leave in the ground because the costs of extracting the minerals exceed the benefits. The public and the government agencies that represent them should carry out exactly the same sort of hard-nosed economic analysis but from a public perspective. The Otter Creek Mine wishes to make use of public lands, water, air, and natural systems. The mine and railroad will also impose costs on the existing residents and businesses. The owners of those public and private resources, represented by various government agencies, need to analyze whether the benefits to the public will justify what will be lost to the public if these public resources are committed to Arch Coal's business plan.

ii. Turning Higher Costs into Higher Benefits

Because Otter Creek coal can be developed only if a new railroad slices through the ranch lands of Montana's Tongue River Valley, developing coal mines there will be more costly than developing coal in an area already served by railroads. The BBER's *economic impact* analysis turns this unfortunate economic cost into an attractive economic benefit since more money will have to be spent and more people employed.

The high environmental and social costs associated with building the Tongue River Railroad is one of the things that makes that coal development in Montana's relatively pristine Tongue River Valley so controversial. The BBER *impact analysis* attempts to turn some of these additional *costs* into a "benefit" to the Valley and state.

One serious problem with using *economic impact analysis* to evaluate coal mining proposals is that most of the public costs are ignored. As a result, all sites become generic sites, and unusual costs can be presented as significant positive impacts. This type of economic confusion does not lay the basis of rational mine siting or economic decision making.

iii. The size of the positive impacts associated with the proposed Otter Creek Mine crucially depends on the market that the Otter Creek Mine will serve.

BBER is appropriately concerned that Otter Creek coal not be sold into existing domestic markets now served by other Montana coal mines. If Otter Creek coal has to compete with existing Montana coal producers and displace them because the market is limited, then the economic gains from Otter Creek will largely be offset by economic losses to other, existing, Montana coal mines.

As BBER points out, the key to the competitiveness of this expanded Montana coal production in Asian markets is the construction of several coal ports on the west coast of the United States. None of those coal ports have been approved yet and considerable controversy surrounds them. If they do not get built and these new mines and mine expansions have to serve domestic U.S. markets, not Asian markets, the BBER's estimates of the positive *economic impacts* will prove to be significant exaggerations as competition among Montana mines for a limited and shrinking domestic market eliminates most of the positive *economic impacts* of the new mine.

iv. The high pay projected for *all* of the new jobs associated with the Otter Creek Mine and associated railroad is misleading.

If the job impacts estimated by BBER are assigned the 2010 average pay associated with each of those industries in Montana, the average pay for all of the jobs the BBER projected to be caused by the Otter Creek Mine would be $38,000 a year. Less than a quarter of these jobs would be in mining and railroads. The rest would be scattered across the wide industrial structure of jobs in Montana. Yet BBER estimates those jobs will pay $67,000 per year, almost twice the current level of pay in those jobs. *All* jobs, across the full range of employment opportunities in Montana, cannot be well above average in pay.

v. Ignoring the volatility and long-run decline in mining jobs.

The BBER's discussion of the mining jobs created by the Otter Creek Mine suggest more permanence and stability than is appropriate when discussing mining jobs and other jobs regularly affected by technological change and market conditions. Mining jobs tend to fluctuate with market conditions such as the current depression in demand for coal in American markets. Mining jobs also suffer from the constant adoption of labor-displacing technological change. As a result, actual employment in coal mining will be relatively unstable and on a declining trend line.

vi. The high number of jobs projected to be created.

BBER projects that about 400 jobs will be created in coal mining and railroading, but, when "multiplier impacts" are included, BBER projects that a total of 1,740 jobs will be created. That, of course, is a large number of jobs. The BBER characterizes these jobs as having a "significant" impact on the overall Montana economy, making it larger and more prosperous. That suggests that we can judge the relative importance of these jobs by comparing them to the overall Montana economy. In 2011 there were 629,000 jobs in the Montana economy. The 400 direct jobs in the new mine and railroad would represent six-hundredths of one percent of all jobs, 1 out of every 1,600 existing jobs. The 1,740 total jobs the BBER projects represents three-tenths of one percent of all jobs, one out of every 362 jobs.

The approximately 400 direct jobs associated with the Otter Creek Mine and associated railroad would represent about 12 **days** of normal job growth in the Montana economy If one trusts the projections of "indirect" and "induced" jobs, jobs that the coal mine and railroad do not directly fill, then instead of looking at about 400 jobs BBER indicates we are looking at 1,740 jobs. The Montana economy tends to create this number of jobs every 1.7 months.

vii. Coal mining: A bonanza for government?

The BBER projects that the Otter Creek Mine will have a larger impact on employment and revenues in government agencies than it will on employment and earnings in mining and railroads. This seems to be a bizarre result. The increase in government jobs is projected to be 402. The total mining jobs are 346 while the additional railroad jobs are 51 for a total of 397 jobs directly associated with the mine and railroad. The proposed Otter Creek Mine would boost government employment more than it does mining employment!

BBER treats the increase in population and demand for public services such as schools as part of the *positive* impacts associated with the mine rather than as a potential cost imposed on the government. In general, taxes are the **cost** we pay to obtain valuable and productive public services. Yet in the BBER's *economic impact* analysis, this cost is treated as a benefit. An actual *economic* analysis would proceed to examine the increased demand for public services, the size of the flow of additional revenues to government agencies, and seek to determine whether the new tax revenues will cover the costs of the new public services and whether the net fiscal balance would be negative or positive.

Contents

1. Introduction

Arch Coal has leased from the State of Montana and Great Northern Properties the right to develop the coal on what has come to be called the Otter Creek Tracts southeast of Ashland in Montana's Tongue River Valley. Arch Coal intends to develop a coal mine there and ship the coal north to the main east-west rail lines in the Miles City or Colstrip areas on a new spur rail line that would have to be built into the Tongue River Valley.

The Montana Contractors Association, whose members would help construct both the mine and railroad and might help operate the mine, contracted with the Bureau of Business and Economic Research (BBER) at the University of Montana to analyze the *economic impact* of this coal project in both eastern Montana where the mine and new railroad would be located and on the state as a whole.

The result was a report entitled "The Impact of Otter Creek Coal Development on the Montana Economy."[1] That study concluded that: "By any measure, these are significant impacts [from the mine and railroad] that help create a more productive, prosperous, and populous state economy." (p. 41) "…without Otter Creek [coal mine and railroad] the Montana economy will be smaller, less prosperous, and less populous by these amounts." (p. 42) Given that the mine would directly employ about 350 workers and the rail shipping would directly employ another 50 for a total direct employment of about 400 workers,[2] these sweeping claims about the proposed mine having a significant impact on the overall Montana economy might appear somewhat startling. After all, in 2011 there were about 630,000 jobs[3] in Montana. Adding 400 new jobs, one job for each 1,600 existing jobs, might not be expected to have a transformative impact on the overall economy of the state.

This report investigates whether this relatively small number of mining and railroad jobs could actually have a significant impact on the Montana economy. As will be made clear below, this report critiques the BBER *economic impact* analysis as providing a one-sided, "benefits-only," view of the economic implications of the proposed Otter Creek coal mine and its accompanying railroad. There is controversy over this proposed energy development at this particular location *because* of the perceived costs associated with them. Providing an *economic* study that simply ignores those costs does not make much of a contribution to evaluating the proposed coal development and reaching an informed conclusion about it.

This report *does <u>not</u>* provide that full economic analysis of costs and benefits. Rather, it provides a warning about the incomplete nature of the economic analysis provided by the Montana Contractors Association.

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[1] Patrick M. Barkey and Paul E. Polzin, May7, 2012. http://www.bber.umt.edu/pubs/econ/OtterCreekFinalReport.pdf

[2] Ibid. p. 10.

[3] Bureau of Economic Analysis, Regional Economic Information Service, U.S. Department of Commerce. NAICS Employment N25, 1990-2011.

2. Manufacturing Free Lunches

Economics, as a social science, studies how individuals and societies cope with scarcity. It also develops theoretical guidelines for the optimal use of scarce resources. Central to economics is the need to make tradeoffs or choices that involve weighing benefits against costs in the pursuit of maximum net benefits or minimum net losses.

In real world settings it is rare to find situations where there are only benefits to reap and no costs that have to be considered. As economists often remind us, "There is no such thing as a free lunch."

Because private business activities can have negative impacts on public goods such as the natural and social environment, government agencies have been authorized to regulate many private economic activities to minimize those public costs. Because of this government regulation in addition to government taxation of private economic activity, business ventures can be significantly impacted by public policy decisions.

This has led private businesses to make public relations campaigns and government lobbying efforts an important part of their business plans. The public relations efforts seek to emphasize the positive impacts particular business ventures can have on local communities and governments by creating jobs, increasing payrolls, and paying taxes. These presentations of the positive impacts of proposed business ventures are often used to increase the likelihood that government agencies will permit the ventures, relax the standards that have to be met for permitting, and/or lower the taxes the businesses will have to pay.

This has led to the development of a peculiar type of analysis usually called *economic impact analysis*. It is peculiar within economics because it typically describes economic ventures as having only benefits and no costs for the local community. In addition, it typically takes things that businesses would usually label costs and re-labels them as benefits. In this *economic impact analysis,* no economic choices or tradeoffs need to be made. The "analyst" typically presents an array of pure benefits to the community and implicitly suggests that it would be irrational not to embrace and approve such a free lunch. With only benefits and no costs, the proposed private venture is an offer that is simply too good to refuse.

It should be clear that something is missing from this type of public-relations-based *economic impact analysis,* namely the weighing of benefits and costs and the making of rational choices.[4] If there were only benefits and no costs associated with a proposed project, there would be no controversy about the proposal. It is *because* there are

[4] *Economic impact analysis* does have important uses. If, for instance, a very large project is proposed that may significantly boost the population, placing stress on public services such as schools, police and fire protection, and the local road and highway system, an economic impact analysis can provide warning of these potential disruptive impacts so that mitigation measures and their funding can be planned. Note that in this setting, particular costs associated with the project are explicitly investigated rather than just laying out pure benefits.

perceived costs (as well as benefits) that public controversy emerges. In that setting any economic analysis worthy of that label should attempt to weigh the benefits and costs so as to contribute to a rational public decision.

If BBER had carried out an economic analysis that looked at the full range of benefits and costs associated with the proposed Otter Creek coal mine and associated railroad, it would have included the short- and long-term changes that this industrial development of the Tongue River Valley would have caused including losses to recreation, hunting, fishing, wildlife, water quality, aesthetics, agricultural operations, air quality, fire danger, and associated revenues and costs. These industries and amenities provide substantial benefits to the state and the losses could be significant.

3. Mining Companies Regularly Reject the Development of Well Known Mineral Deposits Because Costs Exceed Benefits

As mentioned above, an *economic impact study* such as that done by the BBER for the proposed Otter Creek coal mine and Tongue River Railroad, focuses exclusively on the financial benefits to various parties who would work for, sell materials and equipment to, or receive tax revenues from the proposed mine and railroad. Of course, if that was all there was to the proposed mine, there would be no concern about or debate over the mine: It would be a pure "blessing," all private and public benefit, no public or external private cost. However, rational economic decision making usually involves carefully weighing the benefits of an action and comparing those benefits to the costs and deciding whether or not the benefits, on net, justify the costs. In that typical economic situation, an analysis that suggests that there are only benefits is not very helpful.

In the following section we very briefly review the most widely discussed potential public and private costs that are *external* to the Otter Creek Mine and Tongue River Railroad in the sense that they are costs that other individuals have to carry, uncompensated by Arch Coal. The point of listing these external costs is not to suggest that there are *only* costs associated with the proposed mine, but, rather, to make sure *all* benefits *and* costs are considered as they should be in any comprehensive and rational economic decision making.

It should be pointed out that this type of critical review of the benefits and costs associated with a proposed mine is not an anti-mining perspective. Mining companies carry out exactly this type of analysis in terms of their own private interests before they make investments in the development and production of a mineral resource. The fact is that most known mineral deposits are left in the ground undeveloped because mineral companies have concluded that the value of the minerals once extracted, processed, and refined does not justify the costs of producing them. The coal deposits in the Tongue River Valley have been known for a long time. In the early 1980s the BLM evaluated the coal for leasing. At the same time, the Montco Mine was proposed in the area, also to be served by the Tongue River Railroad. But neither the coal nor the railroad became a reality. The coal was left undeveloped not because of environmental hostility to mining but because with existing mining technologies and mineral prices at the time, the coal was too low grade and/or the cost too high to justify production. Mining was not economic. The point is that it is not "anti-mining" to leave a known mineral deposit in the ground and not mine it. That happens regularly in the mineral industry when analysis shows that the mineral values do not justify the costs of extraction, processing, and transportation. As a result, those mineral deposits are left in the ground, un-mined.

The public and the government agencies that represent them should carry out exactly the same sort of economic analysis but from a public perspective. The Otter Creek Mine

wishes to make use of public lands, water, air, and natural systems. The owners of those public resources, represented by various government agencies, need to analyze whether the benefits to the public will justify what will be lost to the public if these public resources are committed to Arch Coal's business plan. If the conclusion is that the cost to the public outweighs the benefits to the public, it would be rational for the public to reject Arch Coal's use of those public resources in the Tongue River Valley. Doing so would be no more irrational or anti-mining than similar decisions that mineral companies make on a routine basis to walk away from known mineral deposits on the grounds that they are "uneconomic."

4. The External Costs Associated with Coal Development in Montana's Tongue River Valley

The public costs associated with mining coal to be burned to generate electricity have been widely studied. The Energy Policy Act of 2005 contained a request by Congress that the National Academy of Sciences study and quantify as best it could the costs associated with our nation's production and use of fuel. In 2008 Congress directed the U.S. Treasury to fund that study. In 2009, in response to those Congressional requests, the National Research Council issued a report entitled ***Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use.***[5] One section of that report studied "Energy for Electricity" and, more specifically, "Electricity Production from Coal" (Chapter 2).

Among the non-market economic costs associated with coal mining and coal-fired electric generation, the National Academies of Science emphasized the following:

- Degradation of health and early death from coal mining itself and the air emissions associated with burning the coal.
- Damage to crops, forests, lakes and property from air emissions from the burning of coal.
- Depletion and degradation of water supplies from coal mining and coal combustion.
- Landscape damage from mountain top-removal, strip mining, and water pollution associated with underground coal mining.
- Reductions in visibility and recreational values from coal combustion emissions
- Release of greenhouse gases and contributions to global warming from methane emissions associated with coal mining and carbon emissions from coal combustion.

As requested by Congress the National Research Council sought to estimate as many of these costs in dollar terms as was possible. It focused on the most common air pollutants associated with burning coal: sulfur oxides and sulfate particulate, nitrogen oxides, and other particulates, especially very fine particulates. The study concluded that coal-fired electric generation was responsible for $62 billion in damages each year. The emissions from the average coal-fired plant imposed costs of $156 million per year. This came to about 3.2 cents per kwh generated. The climate change costs were estimated at $30 per ton of carbon dioxide equivalent or about 3 cents per kwh generated. Just these air emission from the combustion of coal added 6.2 cents to the cost of electricity. With average retail electricity prices across all consuming sectors at 9 cents per kwh, the air quality environmental damage added almost 70 percent to the private cost of electricity.

[5] National Research Council, Committee on Health, Environmental, and Other External Costs and Benefits of Energy Production and Consumption, ISBN: 978-0-309-14640-1, http://www.nap.edu/catalog/12794.html.

Of course, the Tongue River Valley has environmental characteristics that will be threatened by coal mining and its associated railroad. The proposed Otter Creek Mine and Tongue River Railroad in Montana's Tongue River Valley adds additional costs given the relatively pristine nature of the valley and its current use primarily for ranching. The mine and railroad would begin the industrialization of the Valley's landscapes and the division of the existing ranches there by the rail corridor. As a result, this particular coal development will cause short- and long-term changes including losses to recreation, hunting, fishing, wildlife, water quality, aesthetics, agricultural operations, air quality, fire danger, and associated revenues and costs. These industries and amenities provide substantial benefits to the state and as stated previously, the losses could be significant.

All coal mining sites are not the same. Some have higher environmental costs associated with coal mining than others. For that reason there may be higher costs associated with proceeding with the Otter Creek Mine than some other mine that might be developed instead.

5. The Importance of the Market for Otter Creek Coal when Measuring Positive Impacts

The BBER's projected expansive positive *economic impacts* of the Otter Creek coal mine on the Montana economy is tied to the BBER's assumed market for that coal. If that coal were to be sold into the U.S. domestic coal market, it would have to compete with other Montana coal mines serving the upper Midwest. That market is not growing. As U.S. EIA reported, during the first quarter of 2012 the use of coal to generate electricity fell to 32 percent of all electricity generated, the same as natural gas's share. At the same time, the carbon dioxide emissions from American energy use fell to their lowest level in two decades.[6] For that reason, Arch Coal's gain is likely to come at the cost of decreased sales by existing Montana coal mines. The positive impacts of the Otter Creek mine could be partially or wholly offset by the negative impacts associated with other Montana coal mines scaling back production or shutting down.

The BBER was quite explicit about this in its *economic impact* analysis of the Otter Creek mine, emphasizing their assumption that the Otter Creek mine would not displace other existing Montana or regional coal producers:

> Economic impacts occur because of events or activities that create new expenditures. Spending which is new—which is over and above existing expenditures **and does not simply displace spending elsewhere in the region**—not only adds to economic activity in its own right, but it also induces further spending as recipients of wages, sales and tax revenues spend a portion of their income in the local economy. (p. 19, emphasis added).
>
> ……
>
> Finally, the product produced by Otter Creek—**high quality coal delivered to domestic and overseas markets—does not displace or crowd out other Montana producers**. Thus its activities add to, rather than supplant or replace, other activities in the economy. The uses and demand for electricity worldwide continue to grow, and the prospects for the state with the nation's largest coal reserves to take advantage of the opportunity are very good. (p. 43, emphasis added)

In the second quote, BBER appears ambivalent over whether the market for Otter Creek coal will be overseas or U.S. domestic electric generators. But just pages earlier

[6] *Today in Energy*, U.S. Energy Information Administration, October 19, 2012, http://www.eia.gov/todayinenergy/detail.cfm?id=8450 ; *Today in Energy*, August 1, 2012, U.S. Energy Information Administration, http://www.eia.gov/todayinenergy/detail.cfm?id=7350 Of course some of the decline in carbon emissions was due to ongoing economic slowdown associated with the "Great Recession."

BBER was very explicit that it would be overseas markets that the Otter Creek Mine would serve:

> Domestic markets are unlikely to provide significant growth for Montana coal. The overall production of U.S. coal has been stable or declining due to increased environmental concerns about coal-fired electric generating plants.
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> The same is not true in Asia, especially Southeast Asia, where coal demand is mushrooming…If this growth in Asian demand materializes, it would have some very favorable impacts on Montana. (p. 16)
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> …….
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> It takes only a quick glance to see that the Montana coal fields are closer to Northwest ports than the Wyoming coal fields. The transportation situation may now be reversed. Just as Wyoming was in a favorable geographic position to serve the fast growth in the south and east, Montana is better situated to serve these fast growing Asian markets. (p. 17)

BBER's emphasis on export markets for Otter Creek coal appears to conflict with the Tongue River Railroad's recent filings with the Surface Transportation Board. In those filings the railroad submitted an Operating Plan (Exhibit D) that described the market it expected to serve: "Although US domestic electric utilities represent the prime demand potential for Otter Creek coal that the TRRC would haul, additional tonnages could be anticipated for export markets."[7] The BBER *economic impact* analysis, on the other hand, appears to explicitly rejected U.S. domestic sales as the likely market for Otter Creek coal.[8]

BBER's concern that Otter Creek coal not be sold into existing domestic markets for Montana coal is appropriate. If Otter Creek coal has to compete with existing Montana coal producers and displace them because the market is limited, then the economic gains to Otter Creek are largely offset by economic losses to other Montana coal mines.

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[7] P. 2. STB Finance Docket No. 30186, Tongue River Railroad Company, Inc. Revised Application for Construction and Operation Authority, October, 2012. In a December 17, 2012, filing the TRRR proposed an alternative route from Otter Creek to east-west rail lines. The new route would have a terminus significantly to the west of Miles city in the Colstrip area, clearly indicating that the TRRR's target market is likely to be to the west: west coast ports to reach Asian markets.

[8] One reason that exports to Asia from the PRB are so attractive to coal companies mining that coal is that the coal companies have been able to pay royalties on the basis of the domestic U.S. value of the coal which at the mine mouth is very low, about $10 per ton during 2012. That same coal, however, may be sold for $80 to $100 a ton in Asian markets. Of course the cost of moving the coal to Asian consumes a substantial portion of that sales price differential. The net value of the PRB coal in Asia, however, is still likely to be several-fold higher than its value in the US. In early January 2013, two members of the U.S. Senate Energy and Natural Resources Committee announced a probe into whether the royalty payments on exported U.S. coal are being calculated correctly. Increased royalty payments could make U.S. coal exports less profitable and possible turn more PRB coal back toward American domestic markets and competition with existing U.S. coal mines.

Put slightly different, if the operating plan that the TRRR submitted to the STB is truthful and the Otter Creek coal will be sold primarily in U.S. domestic markets, then BBER's estimates of significant positive *economic impacts* from the Otter Creek mine in Montana are incorrect. The net impacts would be much lower.

This is not a new point. As the state of Montana was getting ready to lease its Otter Creek tracts, it commissioned Norwest Corporation to do two appraisals of that coal.[9] Norwest Corporation's study of the market for Otter Creek coal came to the following conclusions:[10]

i. The high-sodium character of the Otter Creek coal limits the market into which it can be sold.

ii. The market for Otter Creek coal is "a small number of Midwestern electric generating plants."

iii. Almost all of those Midwestern electric-generating plants are currently served by other Montana coal mines.

iv. Otter Creek coal will have to compete with and displace other Montana coal mines to gain a share of ("nudge into"[11]) that limited and shrinking market.

v. That competition will put downward pressure on the price for coal that all Montana mines will face as they compete for market share in this limited market.

The proposed Otter Creek Mine could bring a large amount of additional coal onto the market. Developing the first of the three Otter Creek tracts would produce 20 million tons of coal per year.[12] This is the level of production assumed in the BBER *economic impact* analysis. The appraisal of the Otter Creek tracts carried out for the State of Montana in 2006 and 2009 assumed that two mines would operate at Otter Creek, producing 37 million tons per year[13], almost twice as much. The latter amount of annual

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[9] Otter Creek Property Summary Report, Volume I of II, by Norwest Corporation submitted to Great Northern Properties and Montana Department of Natural Resources and Conservation, July 12, 2006. Also: Montana Otter Creek State Coal Valuation, Norwest Corporation, submitted to the Montana Department of Natural Resources & Conservation, Trust Land Management Division, January 30, 2009.

[10] See "The Value of the Otter Creek Coal Tracts to the State of Montana: The Dangers of Relying on the Norwest Corporation Appraisal, a report prepared for submission to the Montana Land Board on the Norwest Appraisal of the Otter Creek Tracts, Power Consulting (T.M. Power and D.S. Power), July 31, 2009.

[11] Otter Creek Property Summary Report, Volume I of II, submitted to Great Northern Properties and Montana Department of Natural Resources and Conservation, Norwest Corporation, July 12, 2006, p. 4-4.

[12] Ibid. p. 4.

[13] Norwest Corporation, Salt Lake City, Utah 84111, submitted to the Montana Department of Natural Resources & Conservation, Trust Land Management Division.

coal production would be a very large addition to Montana coal production which has averaged about 40 million tons a year recently.[14] Thus the Otter Creek Mine has the potential to almost double Montana coal production.

The Tongue River Railroad in its most recent filings with the Surface Transportation Board[15] has proposed shifting the destination of the railroad from Miles City to the Colstrip area. This would significantly reduce the length of the new railroad and clearly indicate a western destination for the coal rather than the eastern destination the TRRR had previously insisted was its marketing plan. The dramatically shortened railroad would require less investment and significantly reduce the construction cost and the projected job, income, and tax revenue impacts associated with the railroad.

Just as important, it would carry the coal from Otter Creek to within several hundred feet of the four Colstrip electric generating facilities currently served by the Western Energy mine at Colstrip. It is possible that Otter Creek could undersell Western Energy coal and displace that mine as the source of coal for the Colstrip plants. That, too, would reduce the positive impacts of the Otter Creek Mine on Montana as jobs, income, and tax revenue from Otter Creek came at the expense reduced jobs, income, and tax revenues from the Western Energy mine.

BBER has also carried out an *economic impact* analysis of the proposed expansion of the Spring Creek mine in Montana on the Wyoming-Montana border.[16] This mine would increase coal production by another 20 million tons. In that analysis BBER also assumed that the coal would be marketed in Asia and that Asian demand would be growing so rapidly that Montana coal mines would not be competing with each other in a way that leads some Montana mines to displace others. This allowed BBER to again project very substantial *economic impacts* from the Spring Creek expansion.

The Arch Coal Otter Creek Mine and Cloud Peak Spring Creek Mine are not the only expanding sources of coal in Montana. Signal Peak Mine in the Bull Mountains has leased additional coal and plans to expand production. Ambre Energy which co-owns the Decker Mine with Cloud Peak Energy has settled its legal dispute with Cloud Peak and plans to operate the mine well beyond Cloud Peak's planned closure date and to expand production. Cloud Peak has bought coal properties in southern Montana and northern Wyoming that include the permitted Youngs Creek Mine and a potential CX Ranch mine.

As BBER points out, the key to the competitiveness of this expanded Montana coal production in Asian markets is the construction of several coal ports on the west coast of the United States. None of those coal ports have been approved yet and considerable controversy surrounds them. If they do not get built and these new mines and mine expansions have to serve domestic U.S. markets, the BBER's estimates of

[14] Coal Tables Workbook--2008 Update, Department of Environmental Quality, State of Montana, Table C-2. www.deq.state.mt.us/energy/HistoricalEnergy/index.asp
[15] December 17, 2012.
[16] The Economic Impact of Increased Production at the Spring Creek Mine, prepared for the Montana Chamber of Commerce, October 2012.

the positive *economic impacts* will prove to be significant exaggerations as competition among Montana mines for a limited and shrinking domestic market eliminates most of the positive *economic impacts.*

6. The Higher Environmental Costs Associated with the Otter Creek Mine

The proposed Otter Creek Mine is unusual in that it would be located where there is no railroad infrastructure to transport the coal. To make the mine viable, a railroad will have to be built into the Tongue River Valley either from Miles City or from Colstrip. This is an indication of how relatively pristine the Tongue River Valley in Montana is. It is largely ranch country with very few substantial settlements and very little non-agricultural development. The coal mining and railroad will go a significant way towards industrializing the valley, splitting ranches, increasing highway traffic to bring in workers and supplies, etc.

The high environmental and social costs of locating a mine in the Tongue River Valley is what makes that coal development so controversial. The BBER *impact analysis* turns some of these additional *costs* into a "benefit." Since a railroad has to be built, that higher construction cost is treated as part of the employment, income, and tax revenue "benefits." Anything that raises the cost of a project without rendering it uneconomic is treated as an "economic benefit" under the *economic impact analysis* approach.

There are many alternative sources of coal in Montana's Powder River Basin. The BBER has analyzed another mine that we have already mentioned, the 20 million ton per year expansion of the Spring Creek Mine about 50 miles south of Otter Creek on the Montana side of the border with Wyoming. The employment, income, and tax revenue impacts of additional coal mining are likely to be more or less similar wherever the additional coal is mined.

The environmental and social impacts associated with coal mine development, however, may vary dramatically from one site to another. Entering a pristine agricultural valley to build a railroad and a coal mine is unlikely to be the least social cost way of obtaining coal when there are already coal mines sited where railroad infrastructure is in place or nearby and where land has already been committed to coal production. One serious problem with using *economic impact analysis* to evaluate coal mining proposals is that most of the public costs are ignored, all sites become generic sites, and unusual costs can be turned into a significant positive impact. This does not lay the basis of rational mine siting or economic decision making.

7. Exaggerating Pay Levels Associated with Coal Mining

The BBER *economic impact* analysis suggests that when the mine is built and fully operating in 2019 there will be 346 workers employed directly at the mine and another 51 working with the railroads transporting the coal out of Montana. In addition there would be jobs associated with supplying the mine with materials, equipment, and services, as well jobs associated with all of the new job-holders spending their paychecks in local businesses. Those *indirect* and *induced* jobs were projected to total 1,343. Thus the BBER projects a total of 1,740 new jobs associated with the operation of the Otter Creek Coal Mine. Note that the projected total job impact is over four times the number of jobs directly associated with the mine and railroad serving it.

The payroll associated with all of these jobs was estimated by the BBER to be $119.4 million per year. Dividing this payroll by the number of jobs gives us the average annual wage associated with each of these jobs. The average annual wage is almost $67,000 per year. This would not be a startling pay level for a miner or a railroad worker. In 2010, the annual wage in mining in Montana was $81,000 and the average wage in transportation in the state was $96,000. But only 20 percent of the total jobs estimated by BBER would be in mining and only 3 percent would be with railroads. The rest of the jobs are distributed across the whole of the economy including low paid jobs such as those in retail trade (14 percent of the job impact) or in entertainment, food service, and accommodations (8 percent of the jobs impact). Pay in these jobs was $27,000 and $18,000 respectively in 2010. If the job impacts estimated by BBER are assigned the 2010 average pay associated with each industry, the average pay for all of the jobs projected to be caused by the Otter Creek Mine would be $38,000 a year, not $67,000, only about half the level estimated by the BBER.

The reason for this exaggeration of the pay associated with jobs related to the operation of the Otter Creek Mine is that the BBER estimated the pay level for the year in which the mine was fully operating, 2019. In addition non-wage benefits were included in the statement of the “pay levels.” Thus the cost of health insurance and retirement plans were included. As a result of the assumed real increase in pay levels between 2010 and 2019, annual pay level (with benefits) in mining and railroads was assumed to rise to six-figure levels by 2019 ($120,000 per year). Pay in the other jobs was assumed to rise to $53,000. A four percent annual real increase in pay levels would have this impact.

Although it is no doubt pleasant to contemplate what pay levels might be in the future and add to that the monetary value of benefits to come up with startlingly high pay levels, most people do not think about jobs and paychecks in those wishful terms. Pay levels in the mining and railroad jobs are already dramatically higher when compared to pay in most other jobs. There is no need to overstate all pay levels to “sweeten the pot.” *All* jobs created cannot be well above average.

8. Exaggerating the Number and Stability of the Direct Jobs Created by the Otter Creek Mine

The BBER's estimates of jobs created suggest more permanence and stability than is appropriate when discussing mining jobs and jobs regularly affected by technological change and market conditions.

For instance the BBER reports that almost 2,000 jobs will be created during the construction of the mine facilities and railroad. Of course that construction employment would be at that level only briefly, for two years, and many of the jobs would last for an even shorter period of time as one part after another of the project is finished. The total construction workforce would fall rapidly towards zero beginning in the third year. Those jobs are obviously good for the specialized construction workers who come in to fill them, but they do not provide stable employment for local communities in the vicinity of the mine.

The mining jobs created once the mine is operating will be subject to two forces that add considerable uncertainty about future employment. First, mining employment fluctuates with the level of demand for the mineral being produced. The stagnation and decline in demand for coal within the United States due to the lingering Great Recession, the uncertainty about future regulation of coal burning, and the very low natural gas prices has already impacted employment in the American coal mining industry with layoffs at both Montana and Wyoming coal mines. Coal companies are hoping that coal exports can stabilize and even increase the demand for U.S. coal, but that will depend on the development of costly export infrastructure and the competitiveness of American coal in international markets.

In addition, technological change has operated to displace workers in the mining sectors. More and more sophisticated equipment has been deployed. This boosts the productivity of miners, justifying their high pay levels, but it also systematically reduces the number of workers who are needed for any given level of output. The BBER estimates of the miners needed at the Otter Creek Mine shows the number falling from 346 when the mine begins production in 2017 to 224 in 2036. Over a third of the mining jobs would be lost over the life of the mine with job losses beginning almost immediately after the startup of the mine. The same is true of the railroad jobs.

9. Putting the Projected Job Gains into the Perspective of a Growing Economy

The BBER estimates that 346 jobs will be created at the mine and that the railroad will employ another 51. That represents just shy of 400 jobs directly associated with the new mine. BBER expects that another 1,343 jobs will be created in businesses that supply the mine with materials, equipment, and services and in the businesses where workers spend their paychecks. That would be a total of 1,740 total jobs that BBER expects to be created as a result of the operation of the mine.

That, of course, is a large number of jobs. The BBER characterizes these jobs as having a "significant" impact on the overall Montana economy, making it larger and more prosperous. That suggests that we can put these jobs in a meaningful context by comparing them to the overall Montana economy. In 2011 there were 629,000 jobs in the Montana economy. The 400 direct jobs in the new mine and railroad would represent six-hundredths of one percent of all jobs, 1 out of every 1,600 existing jobs. The 1,740 total jobs the BBER projects represents three-tenths of one percent of all jobs, one out of every 362 jobs.

We can also use the growth of the Montana economy over the last two decades to tell us how long it would take for a normally growing Montana economy to create this number of jobs. The average number of jobs created each year between 1990 and 2007 when the Great Recession hit the U.S. and Montana economies was 12,200 jobs. The BBER's REMI model projection of how the Montana economy would perform going forward for the next decade *without* the Otter Creek mine has 16,200 jobs being created each year. If we look at 17 years going forward to match the 17-year 1990-2007 period, the REMI Base Case run projected 11,500 jobs would be created each year. We will use the actual performance of the Montana economy in jobs creation before the Great Recession hit as a measure of "normal" job growth.

The approximately 400 direct jobs associated with the Otter Creek Mine would represent about 12 **days** of normal job growth in the Montana economy. The heath care sector would create this number of jobs in 4.6 months and the construction industry would create this number of jobs in 2.4 months. Clearly the 400 jobs does not represent a major or "significant" number of new jobs in the Montana economy as a whole.

If one trusts the projections of "indirect" and "induced" jobs, jobs that the coal mine and railroad do not directly fill, then instead of looking at about 400 jobs we are looking at 1,740 jobs. The Montana economy tends to create this number of jobs every 1.7 months. The construction industry creates this number of jobs every 10 months. The health sectors create this number of jobs every one and two-third years. From this perspective, even this level of job creation does not represent a significant acceleration of the growth of the Montana economy.

10. Otter Creek Coal: A Bonanza for the Government?

The BBER projects that the Otter Creek Mine will have a larger impact on employment and revenues in government agencies than employment and earnings in mining or railroads. This seems to be a bizarre result. The increase in government jobs is projected to be 402 (Figure 5.3). The total mining jobs are 346 while the additional railroad jobs is 51 for a total of 397 jobs directly associated with the mine and railroad. The mine impacts government employment more than it does mining employment!

The wage and salary disbursements by the mine to its workers are projected to be $88.1 million before benefits are added in and Social Security and Medicare taxes subtracted out. The increase in state tax revenues from the operation of the mine is estimated by BBER to be $91.6 million, larger than the mining payroll (Table 5.1 and Table 5.3).

These flows of revenues to governments are tied to both the specific taxes levied on the coal mining activities as well as the additional revenues that flow in because of the expanded economy, larger population, and higher level of economic activity.

What is missing from this discussion of a bonanza of tax revenues for local and state governments is a discussion of the increased demands for government services that will accompany the increase in the size of the population, the size of the commercial infrastructure, and the use of public services. BBER treats the increase in population and demand for public services as part of the positive *impacts* associated with the mine rather than as a potential cost imposed on the government.

BBER sees the unusually high wages associated with the coal mine and railroad jobs as well as other spinoff or ripple effect jobs drawing “a significant increase in the population of southeastern Montana resulting from coal development.” (p. 40) In addition, since the BBER assumed that the coal severance tax from the mined coal would go to reduce income tax rates, citizens will see their after-tax pay rise. This too will encourage in-migration to eastern Montana and other parts of Montana. The BBER projects that “by the year 2031 the Otter Creek Mine will be responsible for the addition of almost 5,400 more people throughout the state, with roughly half living in eastern Montana.” (p. 40) This “increase in population will create additional demand for housing, health care, consumer goods, and government services.” (p. 40)

Schools will be one of the public services impacted: “Since younger people are more mobile, population migration has particular impacts on the younger aged cohorts. Of particular interest to rural school districts in the slower growing areas of the state is the impact of coal development on the school-aged population…These population impacts build over time, such that in year 2031 we would expect the total increase [in student population] to approach 1,500. This could stabilize or increase the demand for public schooling in the affected communities.” (p. 41) The same could be said for the increased need for policing, fire protection, road maintenance, park services, etc.

In general, taxes are the **cost** we pay to obtain valuable and productive public services. Yet in the *economic impact* analysis, this cost is treated as a benefit. An actual *economic* analysis would proceed to examine the increased demand for public services, the size of the flow of additional revenues to government agencies, and seek to determine whether the new tax revenues will cover the costs of the new public services. If not, there will be a net cost imposed on the public in the form of allowing the public service to degrade in quality or taxes will have to be raised on citizens and businesses. On the other hand, if the flow of revenues more than covers the cost of expanding the public services to serve the new population, then there may be a "bonus" that can help improve the quality and range of public services or reduce the tax burden on the citizenry or both. In the latter setting, there may be a net positive balance in the public sector, but the size of the net positive balance will be smaller than the total flow of revenue to the government.