

**Report on the Economic Analysis
of the 2/18/11 Draft Environmental Impact Statement
For the Northern Arizona Proposed Withdrawal¹**

By Richard Merritt
Elliott D. Pollack & Company
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Elliott D. Pollack & Company was retained by the Grand Canyon Trust to evaluate the economic impact portions of the Draft Environmental Impact Statement (DEIS) for the proposed withdrawal of approximately 1 million acres of land in northern Arizona from new mining claims. The proposed withdrawal is in response to increased mining interests in the region's uranium deposits in and around the Grand Canyon.

Summary of Findings

Throughout the DEIS, we note a variety of inconsistencies in the use of data and inaccuracies in modeling the economic impact of the withdrawal that cause us to seriously question the veracity of the final conclusions related to the four withdrawal alternatives. Most of our concerns fall under questioning of the methodology of the economic impact analysis and its assumptions.

The analysis presented in the DEIS related to the economic impact of uranium mining in northern Arizona contains errors in inputs and assumptions as well as interpretation of the economic output and value added of mining activities. These errors demonstrate a serious misunderstanding of economic impact theory on the part of the authors.

We question the assumption for the average uranium ore body per mine of 3 million pounds or 1,500 tons of U3O8. This assumption is more than twice the expected output from existing mines that are currently in production or permitted and planned for production in the near future. It is a fundamental assumption that is used throughout the economic analysis.

The economic impact analysis of uranium mining extends well beyond the two counties in Arizona. If the DEIS is to evaluate the impact of mining on northern Arizona, there is little need to extend the impact to the distant San Juan County, Utah where processing of the uranium ore will occur. That processing operation is wholly separate from the mining of the ore and does not impact northern Arizona.

¹ <http://www.blm.gov/az/st/en/prog/mining/timeout.html>

By including the uranium processing operation in Blanding, Utah in the economic impact assessment on northern Arizona, the economic impact of mining is greatly expanded in the report and could mislead lay persons on the true impact of uranium mining in northern Arizona. In addition, any profits related to the sale of yellow cake will flow out of the U.S. to the Canadian company that operates the Blanding, Utah mill and its shareholders. This fact is not addressed anywhere in the DEIS.

The economic impact of mining in northern Arizona should be based on the value of the ore as it is extracted from the ground and transported to Utah. We would recommend that the DEIS address this issue which would permit the development of estimates of the economic impact of uranium mining on northern Arizona.

Methodology and Assumptions

Following are our questions regarding the methodology and assumptions related to the economic impact of the proposed withdrawal.

1. Comments related to Appendix B Locatable Mineral Resources – Reasonably Foreseeable Development Scenarios.
 - The assumption for the average uranium ore body per mine of 3 million pounds of U3O8 exceeds the expected output from four existing mines that are currently in production or permitted and planned for production in the near future. Those four mines, Arizona 1, Kanab North, Pinenut and Canyon, are expected to average 1.2 million pounds of U3O8 (Tables B-11 and B-12 on page B-35). We question whether the assumptions used in the development of withdrawal scenarios seriously overstate the potential mine output for northern Arizona and, as a result, overstate the economic impacts of mining on the region.

Output from Existing Mines Northern Arizona			
Mine	Ore Tonnage	Grade of Uranium Ore	Lbs U3O8
Arizona 1	70,294	0.68%	956,000
Kanab North	36,122	0.53%	383,000
Pinenut	99,200	1.02%	2,024,000
Canyon	70,500	1.08%	1,523,000
Total	276,116	0.88%	4,886,000
Average	69,029	0.88%	1,221,500

Sources: Tables B-11 and B-12, Page B-35, Appendix B, DEIS

- Similarly related to Table B-12 on page B-35, the ore tonnage for the existing four mines is listed as 276,166 or 69,000 tons per mine. The number of haul trips for 26 new mines of 289,120 calculates to 11,120

haul trips per mine or 278,000 tons of ore per mine based on 25 tons per haul trip. We question how the ore tonnage for each new mine (278,000) nearly equals the total ore tonnage for the four existing mines (276,116). These estimates extend the production time estimated for each mine to three years when the new mines might require fewer production years. This assumption drives the economic impact analysis and could lead to overstating the expected impact in northern Arizona.

- The source of the estimated output of 3 million pounds of U3O8 per mine is indicated on page B-26 of Appendix B as the American Clean Energy Resources Trust (ACERT), which has a vested interest in the uranium assets of northern Arizona on behalf of its members. ACERT issued an economic impact report prepared by Tetra Tech entitled “Economic Impact of Uranium Mining on Coconino & Mohave Counties, Arizona” in September 2009. That report outlines historic mining activity in the region in Table 2 on page 9. A copy of the table follows:

Mine Name	Production Period	Tons Mined	Grade of U3O8	Total Pounds U3O8
Hack Canyon I	1981-1987	133,822	0.530	1,419,623
Hack Canyon II	1980-1987	497,099	0.704	7,000,273
Hack Canyon III	1981-1987	111,263	0.504	1,121,748
Pigeon	1985-1990	408,794	0.643	5,651,862
Kanab North	1988-1991	260,818	0.531	2,767,570
Pinenut	1988-	25,807	1.020	526,350
Hermit	1989-1990	36,339	0.760	552,449
Total		1,473,942	0.647	19,039,875
Average		210,563		2,719,982
Median		133,822		1,419,623

Source: Economic Impact of Uranium Mining on Cononino & Mohave Counties, Arizona prepared for ACERT by Tetra Tech, Golden Colorado, page 9. Data as reported in the 1998 International Uranium Corporation United States Securities and Exchange Commission Registration Statement.

In actuality, according to the table, the historic output per mine in northern Arizona is 2.7 million pounds of U3O8, not 3 million pounds. This overstates the average output by more than 10%. In addition, the data is skewed by the output of The Hack Canyon II mine at 7 million pounds of U3O8. A more logical output estimate may be the median value rather than the average due to the extremely high output of one mine. The median value is 1.4 million pounds. Also, the number of tons of ore mined in the seven mines averages 210,563 with a median value of 133,822 tons. These actual production values are much less than the forecasted 278,000 tons of ore produced per mine contained in the DEIS. Once again, the overstatement of the forecast estimates in the DEIS creates an overstatement of the economic impact of mining on northern Arizona.

- The Denison Mines’ website contains a table of expected ore tonnage and uranium output for the Arizona 1 mine and the four additional mines that are planned and permitted in the region. The estimates were obtained from technical reports prepared by Scott Wilson, an engineering firm that is now part of URS Corporation. Those forecasts show similar results as previously mentioned – that the mining of ore and output of U3O8 is much less than 3 million pounds of U3O8 per mine. In the case of the five mines noted below, the amount of ore mined averages 92,840 tons, producing nearly 1.1 million pounds of U3O8.

Expected Production From Dennison Mines' Arizona Strip Mines				
Mine	Classification	Ore Tons	Grade (%U3O8)	Lbs U3O8
Arizona1	Inferred	70,300	0.680	956,000
Pinenut	Inferred	99,200	0.440	873,000
Canyon	Inferred	70,500	1.080	1,523,000
EZ1	Inferred	110,500	0.510	1,127,000
EZ2	Inferred	113,700	0.430	978,000
Total		464,200	0.588	5,457,000
Average		92,840	0.588	1,091,400

Source: Dennison Mines' Website, Scott Wilson technical reports

In summary, the estimated output of 278,000 tons of ore and 3 million pounds of U3O8 from each mine appears to seriously overstate the expected economic impact of uranium mining on northern Arizona. These assumptions need further investigation and support.

2. We question why the economic impact analysis considers the impact of uranium mining on five counties in Arizona and Utah when all mining activities will be conducted in just two Arizona counties: Coconino and Mohave. While there certainly will be employment and spending impacts on nearby Utah communities in Washington and Kane Counties related to the North and East Parcels, the much more distant San Juan County will have few direct impacts except for the fact that the uranium ore will be processed in Blanding, Utah at Denison Mines’ White Mesa Mill. However, that processing operation is wholly separate from the mining of the ore. If the BLM truly desires to evaluate the impact of mining on northern Arizona, then the economic impact analysis should be focused on the mining activities that occur only in Arizona. Virtually all environmental assessments of the impact of mining in the DEIS focus just on Arizona, not Utah. The economic impact assessment should be conducted in a similar manner.

By including the uranium processing operation in Blanding, Utah in the economic impact assessment on northern Arizona, the economic impact of mining is greatly expanded in the report and could mislead lay persons on the true impact of

uranium mining in northern Arizona. A major assumption of the economic impact analysis is the market price of uranium yellow cake, the finished product after the ore has been processed. That price of yellow cake is a primary assumption that flows through the entire economic impact analysis and establishes the ultimate economic output (the value of industrial production) of uranium mining. However, the yellow cake is processed in Utah, not Arizona, and is sold out of Utah by Denison Mines, a Canadian company. The economic impact of the processing operation benefits Utah, particularly San Juan County, and not Arizona. In addition, any profits related to the sale of yellow cake will flow out of the U.S. to the Canadian company and its shareholders. This fact is not addressed anywhere in the DEIS.

Instead, the economic impact of mining in northern Arizona should be based on the value of the ore as it is extracted from the ground and transported to Utah. Clearly there is a value to be placed on this ore and, in fact, Denison Mines' White Mesa Plant is purchasing ore from mines in northern Arizona controlled by independent parties. Denison Mines' Independent Miner – Ore Schedule of February 1, 2011 for Arizona Strip uranium ore provides pricing for a ton of ore ranging from \$227.50 per ton with a uranium grade of 0.34% to \$966.08 per ton with a uranium grade of 1.05% (based on a uranium sales value of \$73 per pound). Assuming the grade of the ore averages 0.60%, the mining and hauling operation would account for approximately 60% of the value of the finished uranium yellow cake. At a price of \$62.50 per pound (the average price of uranium yellow cake in January 2011), the uranium ore would be worth approximately 57% of the value of yellow cake (uranium spot price hit low of \$53 on 3/18 and as of 3/21 was \$60.)

A second source of information was found in a technical report prepared by Scott Wilson, an engineering firm that is now part of URS Corporation. The report entitled "Technical Report on the EZ1 and EZ2 Breccia Pipes, Arizona Strip District, U.S.A." was prepared for Denison Mines Corporation and downloaded from their website. The table references historic operating costs from the late 1990s. While dated, the information indicates that mining and transportation represents about 58% of total operating costs. This source could be used to address the value of output from uranium mines in northern Arizona.

TABLE 18-1 HISTORICAL OPERATING COST ESTIMATES BY ENERGY FUELS					
Denison Mines Corp. - Arizona Strip Project					
Mine	Mining \$/ton	Haulage \$/ton	Total Mining & Haulage	Milling \$/ton	Total \$/ton
Canyon (1984)	\$38.85	\$22.00	\$60.85	\$43.00	\$103.85
Arizona 1 (1993)	\$34.28	\$25.17	\$59.45	\$53.24	\$112.69
Pinenut (1996)	\$39.72	\$34.87	\$74.59	\$41.36	\$115.95
Average	\$37.62	\$27.35	\$64.96	\$45.87	\$110.83

% of Total Cost	Mining	Haulage	Total Mining & Haulage	Milling \$/ton
Canyon (1984)	37.4%	21.2%	58.6%	41.4%
Arizona 1 (1993)	30.4%	22.3%	52.8%	47.2%
Pinenut (1996)	34.3%	30.1%	64.3%	35.7%
Average	33.9%	24.7%	58.6%	41.4%

Source: Technical Report on the EZ1 and EZ2 Breccia Pipes, Arizona Strip District, U.S.A. prepared for Dennison Mines Corp.

Holding costs for Arizona Strip properties are minimal and consist entirely of annual fees for unpatented mining claims on BLM land.

Table 3.16-21 on page 3-276 estimates the value of estimated total available uranium resources in the proposed withdrawal area at \$2,917,640,000 based on 33,155 tons of U3O8 at \$40 per pound. Based on information available, a portion of this value, perhaps 55% to 60%, is related to the value of the raw ore delivered to Blanding, Utah. At a price of \$40 per pound for yellow cake, \$22 to \$24 per pound may be related to the value of the raw ore. This value establishes the ultimate output of the northern Arizona mining operation and is the basis for modeling the economic impact.

3. Comments related to Chapter 3, Section 3.15 Social Conditions.

- Page 3-251: The authors use Bureau of Economic Analysis (BEA) data for evaluation of employment related to mining and tourism. While the data is useful in certain analyses, it is not current and is only available through 2009. Employment data available from the Bureau of Labor Statistics (BLS) is current on a monthly basis and provides a more realistic picture of employment trends. BLS data is the most widely referenced by the media since it estimates job gains and losses on a monthly basis. BEA data, alternatively, includes both full-time and part-time jobs as well as double counting of jobs for those persons with two jobs. As a result, BEA employment data is upwards of 1/3rd higher than BLS data. While a small issue, we believe BLS data should be used as well in the analysis.
- Table 3.16-20 on page 3-275 shows that Arizona, Colorado and Utah possess only 10% to 11% of uranium reserves. With reserves available in other states, we question why the reserves near the Grand Canyon, one of the wonders of the world and the major tourism generator in northern Arizona, would be put at risk to uranium exploration and mining.

4. Comments related to Chapter 4, Section 4.16 Economic Conditions. This section outlines the economic impact assessment methodology and assumptions of uranium mining and final impact estimates for each alternative.

- Pages 4-245 and 4-246 do not identify the economic impact multipliers used in the analysis nor the year in which the dollars are stated (such as, for instance, constant 2008 or inflated dollars). The value of uranium is not identified nor how the wages of mining employees are calculated. While IMPLAN is identified as the input/output modeling system, the inputs to the system are not identified in the chapter.
- Under Section 4.16.2 Impacts of Alternative A: No Action, employment per mine is incorrectly stated as 75 employees per mine based on seven years of planning and permitting, mine development, mine production, and reclamation with a maximum of six mines operating at one time. Employment in economic impact analysis is typically based on person-years of employment. In actuality, each mine will have 200 person-years of employment over seven years or an average of 28.6 employees per year. This miscalculation of mining employment is the most serious error in the economic impact analysis and calls into question the accuracy of the conclusions of all four withdrawal alternatives.

The authors of the impact analysis also indicate that direct employment under Alternative A over 20 years is 2,250 employees or 112 per year. This calculation is in error. Actual direct employment under the assumptions, in fact, totals 5,855 person-years over 20 years or an average of 308 direct jobs per year.

With these miscalculations, the direct, indirect and induced employment and output of the mining operation outlined in this section are in error.

- The text related to Table 4.16-3 states a total of \$5.46 billion in value added and output related to uranium mining, comprised of \$2.06 billion in value added and \$3.39 billion in output. According to IMPLAN and economic theory, value added is a part of output and the two values cannot be added together to arrive at a total estimated impact. Following are the definitions from IMPLAN.

Value Added: The difference between an industry's or an establishments total output and the cost of its intermediate inputs. It equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported).

Output: Output represents the value of industry production. In IMPLAN these are annual production estimates for the year of the data set and are in producer prices. For manufacturers this would be sales plus/minus change in inventory.

The attempt to combine value added and output represents a serious misunderstanding of economic impact theory on the part of the authors of Chapter 4. These errors flow throughout the four withdrawal alternatives as well as for calculation of indirect and induced impacts.

- The inputs to Table 4.16-3 are not identified in the DEIS. We are not able to analyze the table due to the lack of identification of inputs and the errors noted above. The same situation applies to Table 4.16-4.
- Even in the event that Table 4.16-3 was accurate, the output of \$3.39 billion is higher than the value of estimated total available uranium resources in the proposed withdrawal area of \$2.92 billion based on 33,155 tons of U3O8 at \$40 per pound (see Comment 2 of this report related to Table 3.16-21 of the DEIS Chapter 3). The value of the output of withdrawal Alternative A cannot be larger than the \$2.92 billion unless some undisclosed assumptions are provided to explain how they arrived at a higher number. As noted previously, this is just one instance of the inconsistency in the data presented in the economic impact analysis of the DEIS.
- The same comments outlined above apply to Withdrawal Alternatives B, C and D.

Present Valid New Information Relevant to the Analysis

Elliott D. Pollack & Company would be willing to assist in the economic impact analysis for the proposed withdrawal alternatives. However, due to the lack of accurate assumptions and inputs to economic modeling, we are unable to provide new information relevant to the analysis. With proper development of inputs and estimated value of the uranium ore, economic analysis could be undertaken.

Biography of Richard Merritt – President of Elliott D. Pollack & Company

Mr. Merritt has more than thirty-five years of experience in economic development consulting and real estate development. He specializes in economic and fiscal impact analysis, economic development strategies, and real estate market and financial feasibility. Some of his significant accomplishments include co-authoring the *Arizona Statewide Economic Study* that established an economic development strategy for the State of Arizona and its regions. Mr. Merritt authored the *Arizona Affordable Housing Profile*, a study funded by HUD and the Arizona Department of Housing, which examined the housing inventory in each community and county in the State, the affordability of that housing, and efforts being undertaken by those communities to produce new affordable units. In addition, Mr. Merritt and associates of the firm have produced a number of economic impact reports for private clients on mining in Arizona.

Mr. Merritt also managed economic and fiscal impact studies of Bank One Ballpark in Downtown Phoenix and the Arizona Tourism and Sports Authority, the entity charged with constructing a multi-purpose stadium for the Fiesta Bowl and Arizona Cardinals in Glendale. Prior to his present employment, Mr. Merritt worked for retail and land development companies in Greater Phoenix and served as Planning Director and Manager of the Community Development Department for the Town of Gilbert, Arizona.

Mr. Merritt has a Masters of Business Administration from Arizona State University and a Bachelors of Community Planning from the University of Cincinnati. He is a Charter Member of the American Institute of Certified Planners and is an active member in Valley Partnership and Lambda Alpha, an international land economics fraternity.