1997 Annual Review and Forecast of

UTAH COAL

Production and Distribution

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STATE OF UTAH
NATURAL RESOURCES
Office of Energy & Resource Planning

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Executive Summary

While the United States set a new coal production record in 1997, Utah fell short of the all time high set the previous year by about half a million tons. The U.S. produced 1,088 million tons of coal, the fourth consecutive year that production exceeded the one billion ton mark. Utah produced 26.4 million tons of coal which was the second highest production ever. The U.S. exported 83.5 million tons of coal in 1997 which was lower than the previous two years. Utah exports were also lower than the previous two years and came in at 3.5 million tons. The value of coal produced in Utah was $485 million in 1997.

Utah's distributed 25.4 million tons of coal was lower than the previous two years. The major contributors to this diminished distribution were the exports outside of the country which decreased by almost 2 million tons, as well as electric utilities outside of Utah which decreased by approximately 1.6 million tons. During 1998, production and distribution should pass the 28 and 29 million ton mark respectively and set new all-time records.

Utah's coal mines remain the most productive underground mines in the United States. Productivity of Utah mines, just under two tons per miner-hour (tpmh) in 1980 and 1981, has been on the rise ever since, reaching new highs almost every year, with the exception of 1996 and 1997. In 1996 Utah's mines did not achieve a new record partly because of the start-up and development of the Willow Creek mine; while, in 1997, production per miner hour fell below that of 1996 because of difficulties encountered in the Willow Creek mine and transportation problems. The industry expects near record productivity in 1998.

The high productivity level of Utah mines is largely credited to excellent management, capable engineering and geological staff, a high degree of mechanization and the highly skilled workforce. These factors, in conjunction with the high seam thickness and favorable geology existing in Utah, have led to more competitive coal prices for Utah's coal mines which, in turn, have enhanced and guaranteed the success of the coal industry in the state.

Electric utilities consumed the bulk of Utah's coal production. Hunter, Huntington and Carbon Plants of Utah Power, and Intermountain Power Agency's (IPA) Intermountain Power Plant (IPP), purchased 13.271 million tons and consumed 12.721 million tons in 1997. Together these four plants purchased more than 50 percent of all coal produced in Utah, making the electric utility sector Utah's best coal customer. Deseret Generation and Transmission's Bonanza Plant consumed 1.5 million tons of Colorado coal but did not purchase any from Utah. Also, in 1997 electric utilities and cogeneration plants outside of Utah consumed 5.6 million tons of Utah produced coal. Altogether, electric utilities in the United States consumed 71.6 percent of the coal produced in Utah. Including those volumes exported to the Pacific Rim, electric utilities consumed 84.9 percent of all Utah produced coal.

During 1997, Utah purchased and consumed various amounts of coking coal from outside of Utah. Additional imports were required since Utah ceased production of metallurgical coal in 1994; these imports amounted to 1.1 million tons.

In 1997, industrial coal consumption was Utah's third largest consuming sector. Kennecott consumed 61 percent of the 0.67 million tons of Utah's industrial coal. Geneva Steel and various cement and lime plants in Utah consumed the balance. The out-of-state industrial consumption of Utah coal amounted to 2.2 million tons in 1997 and was used primarily by chemical and cement plants in California and cement plants in Nevada; about 0.18 million tons went to the other mountain states and 0.12 million tons to Missouri as well as a small amount to Hawaii.

Far behind the industrial sector, residential and commercial customers consumed almost 0.16 million tons of Utah coal.

Finally, the Pacific Rim countries of Japan, Korea and Taiwan consumed some 3.5 million tons of Utah coal, primarily for electric power generation. This market is expanding and should account for more than 4.6 million tons in 1998.

1997 Utah Coal Production

Production of coal in Utah reached more than 26.4 million tons, the second highest production level in 128 years of recorded production, only in 1996 was production higher than 1997. Gross production topped 27,333,000 tons and net production came in at 26,428,000 tons (Appendix, Tables 1 and 2).

MINER PRODUCTIVITY

In 1997 production fell short of the previous year by 2.4 percent and employment increased slightly, which caused productivity to decrease. The productivity of miner production per year fell from 13,034 tons in 1996 to 12,639 tons in 1997. The number of days worked per year rose from 235 to 247 thereby decreasing coal production per miner per day from 55.5 tons to 51.3 tons. Productivity per miner hour also decreased from the presently adjusted figure of 5.91 tons per miner hour to 5.57. This decrease in productivity could be explained by the development work which was undertaken by Cyprus Plateau at Willow Creek mine and also the inability of Union Pacific (U.P.) to transport the produced coal to the desired destination. At the same time, the number of workforce had been increased in anticipation of greater production levels.

During 1997, a total of 2,091 miners produced 26,428,000 tons of coal. Working an average of 247 days per year (515,480 miner days), miners produced an average of 5.57 tons per hour (Appendix, Table 1), a figure about 5.75 percent lower than 1996's 5.91 tons per hour. (Note: those figures are based on net production). On the basis of gross production, productivity was much higher.

Utah Coal Industry Production, Employment, Productivity and Prices

	Production	Employment	Productivity	Prices
	Million Short Tons	No. of Employees	Tons/Miner Hour	$/Ton
1981	13.80	4,166	1.99	26.87
1982	16.91	4,296	2.05	29.42
1983	11.82	2,707	2.59	28.32
1984	12.25	2,525	2.94	29.20
1985	12.83	2,563	2.80	27.69
1986	14.26	2,881	3.08	27.64
1987	16.52	2,650	3.25	25.67
1988	18.16	2,559	3.69	22.85
1989	20.51	2,471	4.42	22.01
1990	22.01	2,791	4.10	21.78
1991	21.87	2,292	4.79	21.56
1992	21.02	2,106	5.13	21.83
1993	21.72	2,161	5.47	21.17
1994	24.44	2,024	6.01	20.07
1995	25.05	1,989	6.41	19.11
1996	27.07	2,077	5.91	18.50
1997	26.43	2,091	5.57	18.34
1998	28.43	2,186	6.22	18.51

1998 values are forecast

MAJOR COAL FIELDS

The Wasatch Plateau coal field was again the major coal producer in 1997 (Appendix, Maps 1 and 2). More than 86.7 percent of Utah's 1997 coal production (22.9 million tons) came from this field while Book Cliffs accounted for the remaining 13.3 percent or 3.5 million tons. Emery coal field, the only other significant producer in recent years, did not produce any coal between 1992 and 1997. During 1998, Wasatch Plateau coal field is expected to produce a record of 23.9 million tons, representing 84.1 percent of total production.

In contrast, about 4.5 million tons or 15.9 percent of Utah's coal production is expected to come from Book Cliffs coal field. For the seventh year in a row, no production is likely from Emery coal field (Appendix, Table 3).

COAL PRODUCTION BY COUNTY

On a county basis, the majority of Utah's coal production has for the past several years shifted from Carbon County to Emery County. Sevier County's 1997 production remains stable and ranks third, just below Carbon.

Skyline mine which is now owned by Canyon Fuel Corp. and Starpoint mine of Cyprus Plateau shifted production from leases in Carbon to those in Emery County. The balance of coal production by county shifted dramatically from Carbon to Emery since these two mines combined accounted at the time for about 27 percent of total coal production in Utah. The actual shift by both mines started in 1991, became more pronounced in 1992, and almost completed itself in 1993 (Appendix, Table 4). Over time, however, Skyline mine production started shifting back to Carbon County, resulting in more production from Carbon County leases than Emery County in 1994. Compared to Skyline mine, the Starpoint mine shift was more accelerated. This shift was even more pronounced when Cyprus Plateau moved most of its coal operation from Starpoint mine to Willow Creek mine, located entirely in Carbon County.

FEDERAL, STATE, AND COUNTY LANDS

The volume of coal mined from federal leases during 1997 came in at 25.2 million tons. Its contribution, as a percentage of total state production, was about one percent below 1996 figures. This was the second highest percent of production from federal land. Only in 1996 was the percentage higher (96.8) or the tonnage greater (26 million tons).

State lands production had not reached the one-million-ton mark since 1980. In 1992, production easily surpassed this level with 1,384,000 tons of coal produced and again in 1993 with a record of 1,682,000 tons of production.

In 1994, production from state lands decreased to 1,227,000 tons, a figure still higher than at any time in the 1980s. During 1995, production from state lands was cut to less than half of the 1994 level. In 1996 it was lower by more than 125,000 tons than in 1995 and in 1997 it decreased again by 107,000 tons to a new low of 339,000 tons in almost a decade.

As a percentage of total production, the state lands production has only accounted for between one to five percent, which increased to above 6 and 7 percent in 1992 and 1993 respectively; in 1994, it fell back to 5 percent; in 1995 to 2.3 percent; and in 1996 to 1.6 percent. During 1997, state land production registered the lowest percentage production level in more than two decades.

Production from county lands has always been minimal and erratic. During 1997, county-owned lands did not produce any coal.

FEE LANDS

In 1992, for the first time in a decade, coal production from fee lands slipped below two million tons (1.735 million tons). In 1993, production decreased again by 50 percent to 826,000 tons, dropping further in 1994 to 415,000 tons or 1.7 percent of total production. In 1995 production moved up by 11 percent to 461,000 tons or 1.8 percent of total production and again in 1996 it came in at 614,000 tons or 2.3 percent of total production. During 1997, production from fee lands went up to 3.5 percent of the total production while, on a tonnage basis, production increased by 50 percent (from 614,000 to 928,000 tons) as compared to 1996. By contrast, coal produced from fee lands in 1983 amounted to almost 40 percent of total production (Appendix, Table 5).

LONGWALL PANELS AND CONTINUOUS MINERS

During 1997, eight operating longwall panels accounted for 72 percent of production or 19,052,000 tons. This amounted to an average of more than 2.38 million tons of coal production per panel, per year. Twenty-three continuous miners produced a total of 7,376,000 tons of coal for an average of 320,000 tons per machine, per year. In recent years, however, some machines have produced between 400,000 to almost 600,000 tons per year.

Utah Coal Markets: Distribution of Utah Coal

Distribution of Utah coal, which from 1990 to 1993 had been relatively unchanged and remained within a 1 percent range of 21.6 million tons, jumped by 6.9 percent in 1994 from 1993 levels. Between 1994 and 1995, distribution increased by 8.5 percent; distribution in 1996 was 9.3 percent greater than in 1995 and in 1997 it fell back to the 1995 level. Distribution of coal hit an all-time high of 23,441,000 tons in 1994 and set yet another record of 25,443,000 tons in 1995, but 1996 distribution surpassed these levels with 27,816,000 tons, an increase of more than two million tons, however in 1997 it stood at 25,457,000 tons.

Distribution of Utah coal to consumers in Utah stood at 14.03 million tons. This was the second highest rate of Utah coal consumption in Utah in 128 years of coal industry. The distribution to consumers in other states totaled 7.9 million tons, about 1.7 million tons less than in 1996. Overseas exports amounted to 3.5 million tons, about 2 million tons less than the 1996 export level.

ELECTRIC UTILITY MARKETS

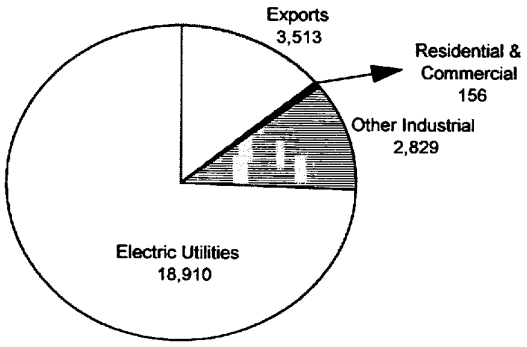
Over two decades ago, electric utility consumption of coal surpassed the consumption levels of industrial coal and coke plant coal. Electric utility consumption became the top market for Utah coal operators. Today about 72 percent of Utah's coal production is consumed to generate electricity in Utah and other states. Including exports, about 84.9 percent of Utah's coal production is consumed to generate electricity. This amounts to 88.1 percent of Utah's total coal distribution.

Distribution by State

About 57 percent of the out-of-state shipment went to coal-fired power plants and cogeneration facilities in Nevada and California. Tennessee and Illinois received the lion's share of Utah's electric utility coal to the east. Canyon Fuel, Co-op and White Oak were the major shippers of coal to Illinois while White Oak, Genwal and Canyon Fuel supplied the entirety of the shipment to Tennessee partly in compliance with the contract detailed in the 1994 coal report. The total shipment to these two states decreased considerably from 1996 levels.

The only other states to the East that received Utah coal for electric utility were Pennsylvania and Wisconsin (Appendix, Table 6).

1997 Distribution of Utah Coal by
Thousand Short Tons



Out-of-State Markets

Distribution of Utah coal to out-of-state markets during 1997 decreased by 22 percent from the 1996 level. Utah shipped a total of 5.6 million tons to out-of-state electric utility/cogeneration customers[1]. This was 1.7 million tons less than the previous year.

[1]The Energy Information Administration, in adhering to a more restricted definition of "electric utility" and "other industrial" coal consumption, classifies cogeneration consumption under the definition of "other industrial" coal. For purposes of this report, coal shipped for consumption to cogeneration facilities is considered "electric utility" consumption, since its main purpose is to generate electricity for sale.

Distribution to Nevada

In Nevada, four electric power generation facilities burn bituminous or subituminous coal. Three of these plants, Nevada Power Company's Reid Gardner Plant, Sierra Pacific Power Company's North Valmy Plant, and Pinon Pine Power Plant, burn Utah coal.

In 1997 Reid Gardner Plant, rated at 636 megawatts (MW), purchased a total of 1.308 million tons of coal and burned 0.983 million tons of coal for a net generation of 3,054 gigawatt hours (GWh) of electricity. Approximately 1.26 million tons of this purchase came from Utah with the remaining 48,000 tons coming from Colorado. Before 1993, Reid Gardner's four units relied almost entirely on Utah coal. One of Nevada Power's four major contracts with Utah coal producers was with ARCO, which originally supplied the coal from its Gordon Creek mines and later from its Trail Mountain mine. In September 1992, ARCO sold Trail Mountain to PacifiCorp but continued to fulfill its contractual obligation to Nevada Power from its stockpile in Utah and through local purchases. However, between 1993 and 1997, ARCO fulfilled the major portion of its obligation from its West Elk mine in Colorado. During 1998, Nevada Power should increase its purchase of Utah Coal under contract with various coal operators in Central Utah. The coal burn from the Willows Creek Mine of Cyprus Plateau has been successful and the purchase of coal from that mine which started in 1997 should continue in 1998. Colorado could still supply a small portion of Nevada Power's requirements.

North Valmy Plant

The two units of the Sierra Pacific Power Company's North Valmy Plant (owned jointly with Idaho Power Company) have a combined generation capacity of 521 MW and require about 1.45 million tons of coal per year. In 1997, Utah coal shipments to North Valmy Plant totaled 1.1 million tons, which represented an increase of 10 percent over 1996. Sierra Pacific purchased a small additional amount of coal from Black Butte Coal Company near Rock Springs, Wyoming.

In 1997, the two units of North Valmy Plant burned 1.3 million tons of coal to generate 2,988 GWh of gross and 2,784 GWh of net electricity. During 1998, this plant is expected to generate about 3,745 GWh of gross or 3,500 GWh of net electricity by consuming 1.6 million tons of coal.

Despite considerable reduction in electric generation due to greater availability of hydropower from the Northwest and consumption of a much greater amount of natural gas for electric generation, the coal purchased from Utah increased by more than 10 percent. However, the coal purchased from Wyoming decreased considerably.

Pinon Pine Power Plant

Pinon Pine Power Plant began in September 1991 when nine projects were selected under Clean Coal Technology Programs (CCTP), Round IV. This 107 MW electric generation plant is located at Sierra Pacific Power Co.'s Tracy Station 17 miles east of Reno, Nevada.

The project's main objective is to demonstrate commercial feasibility of a low-Btu gas combustion turbine fed by an air-blown, pressurized, fluidized-bed Integrated Gasification Combined Cycle (IGCC) unit under an environmentally acceptable condition. During August 1992 the DOE and Sierra Pacific Power Co. (SPPC) signed a cooperative agreement to carry out the project. The DOE and SPPC provided the required funding of $308 million on an equal basis.

The core of the project is a fully conventional combined cycle power plant capable of operation on natural gas. The M.W. Kellogg Co. provided the technology for this advanced IGCC. The company used a Kellogg Rust Westinghouse (KRW) version of the World War II vintage coal gasification technology.

The project's Environmental Impact Statement (EIS) was completed on November 8, 1994, and construction began February 1995. In 1996, the power plant was completed and the unit went into commercial operation in December.

The coal gasifier was completed in early 1997. The coal gasifier converts coal into clean burning gas to be consumed in the General Electric combustion turbine. This unit will operate for the next four years as a demonstration unit and the cost of fuel and operation will be shared equally by DOE and SPPC.

The net design efficiency of this unit is about 40.7 percent, which is equivalent to a heat rate of 8,390 Btu/kWh. It is the most efficient coal-based unit in the country. Because the fuel produced by the gasifier is cleaned, the emission of NO_x and SO_2 is reduced by over 90 percent.

After this fuel is burned in the gas turbine to generate electricity, the excess heat from the turbine is used to produce steam. The steam is used in a steam turbine generator to generate more electricity.

The unit's advanced design boosts its efficiency by 20 percent over that of conventional power generators, a process which results in 25 percent less CO_2 emission for the generation of the same amount of electricity. This unit also uses 20 percent less water to generate the same amount of electricity as conventional generators which makes it a very desirable unit in the arid region of the American West.

The IGCC is designed to consume different grades of coal. On a regular basis, central Utah operators will supply the required coal, which could amount to 320,000 tons per year. At times, however, other coal, specifically high-sulfur coal from the Midwest, may be consumed to evaluate the technology's possible applicability elsewhere in the U.S. or abroad. This unit's flexibility of fuel usage allows it to use natural gas, coal or any combination of the two for maximum fuel cost savings. The unit's other advantage is its ability to generate electricity by consuming only natural gas when the gasifier is down for repair or maintenance.

During 1996 the coal purchased for this unit was minimal and for 1997 it was just over 10,000 tons, however, the plant operated only on natural gas during the entire year. It is anticipated that by the middle of 1998 coal consumption will start and reach into the area above 100,000 tons per year level.

California

More than 0.86 million tons of Utah coal went to cogeneration facilities in California. The electric utility market for Utah coal in California presently includes six coal-fired cogeneration units.

Stockton California Plant

Stockton, Calif., is the site of the first coal-fired cogeneration facility ever to burn Utah coal. This unit is operated by Air Products & Chemicals, Inc. and began commercial operation in March 1988. This 49.9 MW unit is capable of consuming 220,000 tons of coal per year to generate about 425 GWh of electricity.

In 1997, this plant purchased 87,500 tons of coal, all of which came from Utah. It consumed 104,000 tons of coal to generate a total of 432 GWh of gross or 389 GWh of net electricity. Just over 32 GWh of the electricity and all of the steam by-product were used by an adjacent corn wet milling plant owned by Corn Product Co. International. Pacific Gas and Electric Co. (PG&E) purchased the remainder 357 GWh. During 1997, this plant will purchase 111,000 tons of coal and is planning to generate 412 GWh of net electricity, most of which will be sold to PG&E.

Mt. Poso Plant

In May 1989, a second coal-fired cogeneration facility was commissioned. It is owned by Mt. Poso Cogeneration Co., a consortium of Ahlstrom Development Corp., Pacific Generation Co. and Bechtel Enterprises, Inc. This 49.9 MW plant is located in the San Joaquin Valley and is operated by Pyropacific Operating Company and Pacific Genera-

tion Company. During 1997, operators purchased 132,000 tons of Utah coal and burned 133,000 tons to generate 337 GWh of gross or 297 GWh of net electricity that was sold to PG&E. The operations in the Mt. Poso Field-West used the steam by-product for enhanced oil recovery. During 1998, this unit will consume 23 percent more coal and generate close to the same percentage more electricity.

ACE Plant

The largest coal-fired cogeneration facility in California, with 96 MW of installed electric generation capacity, is owned by ACE Cogeneration Co., which is in turn owned by Ahlstrom Development Corp., Constellation Holding, Inc. and Kerr McGee Chemical Company. This unit is located in Trona, California and started operation in September 1990. North American Chemical Company's two soda ash plants adjacent to the ACE Plant use the steam by-product. This unit has the capacity to burn 300,000 to 350,000 tons of coal per year to generate between 650 to 750 GWh of electricity. During 1997, the firm purchased 389,000 tons of Utah coal and burned 389,000 tons to generate 870 GWh of gross electricity. Southern California Edison Co. purchased the net 793 GWh of electricity. This unit is expected to burn about the same amount of coal during 1998.

Rio Bravo Plants

Ultra Power, Constellation and Hadson are the owners of a twin cogeneration plant in Bakersfield named Rio Bravo Poso and Rio Bravo Jasmin. Construction of this twin plant started on December 1987 and was completed on March 1990. The plant started commercial operation in September 1989 and came on-line early in 1990.

During 1997, Rio Bravo Poso purchased 64,000 tons of Utah coal, burning about 62,000 tons to generate 252 GWh of net electricity, which was ultimately sold to PG&E. The Rio Bravo organization used the steam by-product in its oil field for enhanced oil recovery operations. During 1998, this plant will consume 75,000 tons of coal and will generate 280 GWh of gross electricity. Rio Bravo Jasmin purchased 62,000 tons of Utah coal and burned 65,000 tons to generate 274 GWh of net electricity which was sold to Southern California Edison. Rio Bravo oil field also used the steam by-product of this unit for enhanced oil recovery. During 1998, this plant is expected to purchase and burn slightly more Utah coal, as compared with 1997, and generate close to the same amount of electricity.

Energy Factor Plant

Another cogeneration plant, Energy Factor, is located in Stockton. This 45 MW cogeneration plant was initially purchased by Sithe Energy in 1990 and then sold to a partnership of National Power Company and ESI in 1993. ESI, a wholly owned subsidiary of Florida Power Company, originally backed only this transaction, but later decided to take a more active role in the plant's daily operation. This plant is now operating under the name of Port of Stockton District Energy Facility (POSDEF) Power Company L.P. The steam by-product from this plant goes to three processing facilities within the same industrial complex: California Cedar Products Company, which manufactures cedar wood products including Dura Flame logs and Cargill and Liquid Sugar, both of which import raw sugar from Hawaii and manufacture various food products for human and animal consumption. This cogeneration unit can use about 200,000 tons of coal per year. The coal supply contract for this company is with Oxbow Carbon and Minerals, Inc. of Colorado (previously known as Pacific Basin Resources). During 1997, this company purchased 93,000 tons of coal, all of which came from Utah. This unit consumed 125,000 tons of coal to generate 278 GWh of gross electricity; 240 GWh net generation was sold to PG&E. For the foreseeable future, it is likely that all of the requirement of this unit will be supplied solely by Utah.

Shipments of coal for consumption by electric power plants in Nevada are expected

to increase by 5.4 percent from 1997's total to 2.5 million tons in 1998. During 1993, the amount of coal sold to electric utilities within the U.S. excluding Utah, Nevada and California - the main users of Utah coal - nearly doubled from 556,000 to 1,087,000 tons. During 1994, this consumption reached 1,710,000 tons, more than 200 percent over 1992 and about 60 percent over 1993 levels. In 1995, this consumption shot up to 3,395,000 tons, which was almost twice that of 1994. In 1996 this consuming sector surpassed 3.9 million tons, an increase of nearly 15 percent over 1995. During 1997 this consumption decreased to 2.44 million tons. States receiving electric utility coal from Utah included: Tennessee (1,499,000 tons); Illinois (647,000 tons); Pennsylvania (226,000 tons); and Wisconsin (72,000 tons). During 1998, this consumption should increase by 87 percent from 2.44 million tons to 4.56 million tons mostly due to greater shipments of coal to Illinois. Because of this increase, Utah coal distributed to all other states for electricity generation is expected to increase from 5.6 million tons in 1997 to 7.9 million tons in 1998.

Utah Markets

Coal consumed in Utah to generate electricity amounted to nearly 12.72 million tons in 1997, which exceeded expectations; in point of fact, Utah coal shipped to electric utility plants was 13.271 million tons.

Hunter Plants

PacifiCorp's Hunter I, II, and III, with availability of 86.17 percent and utilized availability of 95.16 percent, consumed 4.221 million tons of coal mostly from PacifiCorp's Cottonwood mine and some from Deer Creek mine to generate 8,871 GWh of net electricity. During 1998, this plant should be working at about 90 percent capacity factor resulting in 8.5 percent more coal burned and as much as 12 percent more electricity generation.

Huntington Plants

Huntington I and II, with plant availability of about 84.0 percent and utilized availability of 98.8 percent, consumed 2.687 million tons of coal produced from PacifiCorp's Deer Creek mine to generate 6,143 GWh of electricity. During 1998, this plant should be working at 87.0 percent availability and 100 percent utilized availability, resulting in 10 percent more coal burn and slightly higher than 9 percent more electricity generation.

Carbon Plant

Carbon Plant, with availability of 92.5 percent and utilized availability of 99.1 percent, consumed more than 654,000 tons of coal to generate 1,405 GWh of electricity. The coal for this plant was mostly produced by Deer Creek mine of PacifiCorp; some was purchased from other coal operators. It is very likely that the capacity factor for PacifiCorp's three plants could be as much as 6 percent higher in 1998 than in 1997, and coal consumption could increase from 7.56 to 8.19 million tons. In 1998, coal production for distribution to Utah electric utilities is likely to increase but not as much as the increase in consumption, which means that PacifiCorp would decrease its stockpiles to some extent.

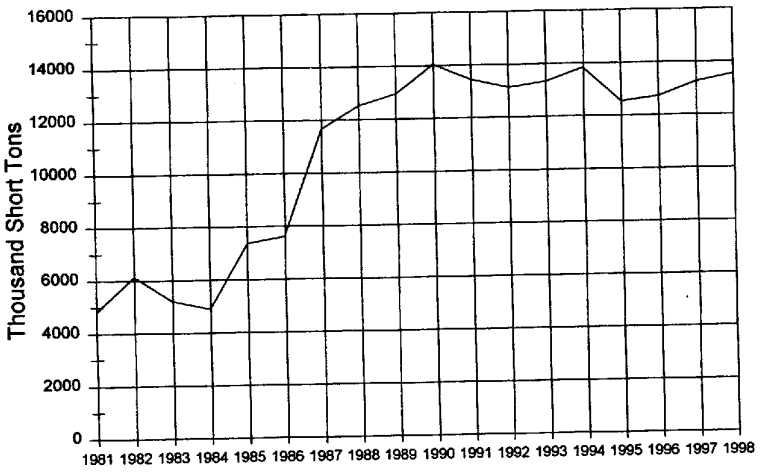
IPP Plants

In 1997, the Intermountain Power Plant (IPP), of Intermountain Power Agency (IPA), with availability of 93.52 percent, operated at utilized availability of 87.18 percent. The plant's two units, with the total nameplate capacity of 1,640 MW, burned 5.16 million tons of coal to generate 12,770 GWh. States primarily outside of Utah consumed the generated electricity. During 1998, this plant will burn approximately 5.24 million tons of coal to generate 12,735 GWh of electricity, nearly all of which will be sold outside of Utah. All of this coal may not come from Utah as there are indications that negotiations on coal purchase contracts with producers in Colorado had been conducted in early 1998. The higher availability of hydropower in the Northwest at times causes a decrease in coal burned during the Spring and Summer runoff as it did in 1996.

Bonanza Plant

During 1997, Deseret Generation and Transmission's (DG&T) Bonanza Plant with a rated peak capacity of 420 MW, had an availability of 94.8 percent and a load factor of 82.5 percent. This plant consumed 1.5 million tons of Colorado coal to generate 3,013 GWh of electricity. DG&T purchased 1.24 million tons of coal from the Deserado mine, located just 36 miles east of the plant in Colorado, and the remaining 271,000 tons were purchased from other Colorado producers. The total coal purchased in 1997 was 1.51 million tons. During 1998 the availability will increase to 96 percent. The capacity factor should increase to 94 percent and coal consumed will equal 1.7 million tons, resulting in 3,446 GWh of electricity generation.

Distribution of Coal to Utah Electric Utilities



1998 value is forecast

UTAH COKING COAL MARKETS

The market for coking coal in Utah is limited to Geneva Works Steel Mill in Orem, Utah, owned by Basic Manufacturing and Technology of Utah, Inc. Geneva Steel is the only integrated steel mill operating west of the Mississippi River. Located 45 miles south of Salt Lake City, the firm manufactures hot-rolled steel plate, sheet, and pipe for markets primarily in the western and central United States. Geneva's customers include service centers, distributors, steel processors and various end users which include: manufacturers of welded tubing; highway guardrail; storage tanks; railcars; ships; and agricultural and industrial equipment. Geneva is undergoing an extensive modernization program intended to enhance its competitive position by reducing operating costs, expanding product lines, improving quality and significantly increasing throughput capacity. With these improvements in place, Geneva Steel will strengthen its position as a low-cost steel producer while becoming one of the industry's more environmentally advanced steel mills. The company acquired the steel mill and related facilities in a leveraged buy out from USX Corporation in August 1987. Coal purchased by Geneva Works to make coke totaled 1.106 million tons during 1997. The plant consumed about the same amount of coal to make coke for steel production.

As the coke-making battery of Geneva Works ages, its capacity decreases, thus limiting the plant's steel-making capacity. During 1997, Geneva overcame this constraint by directly purchasing 352,000 tons of coke (49,000 tons from Japan and 303,000 tons from China) in addition to its own manufactured supply, to produce about 2.6 million tons of raw steel. To meet its requirement of low- to mid-volatile hard coking coal, Geneva Works has negotiated a long term contract with eastern producers and a five year,

500,000 ton-per-year transportation contract with Southern Pacific railroad, now part of Union Pacific railroad.

During 1997, Geneva bought 208,000 tons of low-volatile Pennsylvania coking coal from Cooney Brothers Coal Company of Cresson, Pennsylvania. In addition, Geneva bought 433,000 tons of high-volatile Colorado coking coal from San Born Creek mine of Oxbow Carbon and Mineral, Inc. (previously known as Pacific Basin Resources) of Littleton, Colorado. This coal is from the same seam as the coal Geneva purchased from Bear Coal Company, Inc. of Somerset, Colorado during early 1990s.

Geneva also bought and consumed 166,000 tons of coal from Wellmore Coal Company of Virginia, situated just east of Grundy which is on the north end of Highway 460 in Buchanan County in the toe of Virginia about 10 miles from the Kentucky border. In addition Geneva received one trainload (about 9,000 tons) of mid-volatile Virginia coking coal from Knox Creek Coal Company situated just west of Richlands, which is on Highway 460 and 19 in Russell County in the toe of Virginia near Graceland railroad station. These two companies are part of United Coal Company.

Furthermore, Geneva purchased 159,000 tons of high quality West Virginia coking coal from Commonwealth Coal Company's War Eagle mine situated just west of Balt which is on County Road 99 about 15 miles due west from Beckley in the south western part of West Virginia.

Lastly, Geneva bought 9,000 tons of mid-volatile West Virginia coking coal from Terry Eagle mine also situated in West Virginia. During 1998, Geneva will purchase a similar amount of coal as in 1997 and about the same amount of coke.

OTHER INDUSTRIAL COALMARKETS

Out-of-State Markets

Since 1989, when shipments of coal to other states for industrial consumption peaked at 2.4 million tons, consumption for this market sector has been declining, reaching only 2 million tons in 1992. During 1993, shipments increased for the first time in four years and in 1994 this trend continued as six operators shipped 2.32 million tons of industrial coal to ten states outside Utah. In 1995, there was a slight increase to 2.4 million tons but in 1996 this consumption decreased slightly to 2.34 million tons. During 1997 there was a further decrease to 2.16 million tons. The largest recipient of industrial coal was California. More than 75 percent of all industrial coal from Utah went to chemical and cement manufacturing plants in the Golden State. Nevada received 177,000 tons for use mainly in cement plants. This consumption was 3.3 percent less than the 183,000 tons the previous year. There was also a shipment of 120,000 tons to Missouri which was non-existent the previous year. Shipments to Arizona amounted to 79,000 tons. Washington shipments ranked fifth with 70,000 tons followed by Idaho which purchased 22,000 tons. Hawaii was a newcomer with 21,000 tons followed by Oregon with only 6,000 tons. In total, this consumption should increase to 2.5 million tons in 1998.

Utah Markets

In 1997, industrial consumption of coal in Utah increased by 28.6 percent to 665,000 tons from 517,000 tons the previous year. Kennecott Copper used more than 60 percent of the total to generate electricity.

Kennecott Copper

During 1997, Kennecott purchased 405,000 tons of Utah coal and consumed 403,000 tons during an eight-month period to generate 862 GWh of electricity. The coal purchase in 1997 increased by nearly 28 percent in comparison with the previous year's figure.

In 1998, Kennecott's coal-fired generation will jump 11 percent. Total coal consumption will amount to 436,000 tons.

Cement Manufacturers

Prior to 1995, Utah's cement manufacturers suspected increasing demand, due to the growth of the housing industry, and began to expand their cement production capacity. Production capacity also

increased due to the I-15 reconstruction project and various other state and county road expansions. Both Holnam and Ashgrove started to increase production prior to and during 1996 and by 1997 were producing considerably more cement.

Holnam

Devil's Slide Plant of Ideal Basic Industries, Inc., a leading cement producer based in Denver, Colorado, has been a part of Holnam since 1986. A series of mergers and acquisitions established Holnam, Inc., as one of the largest cement companies in North America. Dundee Cement Co., Santee Cement Co., Northwestern States Portland Cement Co., Ideal Basic Industries and United Cement Co. have all been brought together under the Holnam banner. Holderbank controls 89.3 percent of Holnam's common stock. In the consolidation process Holderbank's share in St. Lawrence cement was brought into Holnam, which now holds a 60 percent interest in St. Lawrence.

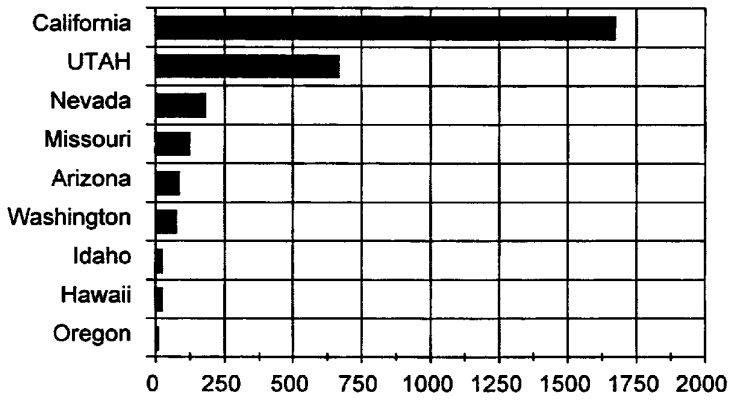
In 1986 Holderbank acquired a 66 percent interest in Ideal Basic Industries, Inc., which had encountered some financial difficulties and required financial restructuring. The nine-plant Ideal Basic system fit in well with the Dundee Cement Co. system, offering new markets to the West, Southwest, and Mid-Central regions of the United States. The whole establishment, comprised of 19 cement plants and 113 distribution terminals in most U.S. states and three provinces of Canada, is now referred to as Holnam.

Devil's Slide Plant switched from Wyoming coal to natural gas in 1991 and continued to burn natural gas until August 1992. In that year, the price of natural gas increased and coal consumption became more economical. During the remainder of 1992, Devil's Slide Plant used 27,000 tons of coal. A significant event occurred when this plant converted from natural gas to coal; it did not automatically switch to Wyoming coal as it had in the past but, instead, started using Utah coal.

During 1993 Devil's Slide Plant purchased 60,000 tons of coal, 40,000 tons of which came from Utah and the remainder from Wyoming. In 1994 the plant's purchase of Utah coal increased to 59,000 tons; the plant purchased only 4,000 tons of additional coal from Wyoming. By 1995 the plant purchased only Utah coal (25,000 tons). The plant used 30,600 tons of coal in total. Some of this coal came from the stockpile and was used with natural gas for summer use and treaded tires and diaper plastics (materials obtained from the Kimberly Clark plant in Ogden) to produce 351,000 tons of cement. In 1996 this plant purchased and consumed 29,000 tons of Utah coal plus some natural gas, tires from

Distribution of Utah Industrial Coal by State

Thousand Short Tons



Salt Lake Treading Co., and diaper plastics from Kimberly Clark to produce 350,000 tons of cement.

During most of 1997, Devil's Slide Plant purchased 26,000 tons of Utah Coal which was consumed in the old plant along with 0.623 billion cubic feet of natural gas as well as 6,100 tons of tires and 4,200 tons of Diaper plastics from the Kimberly Clark Plant in Ogden to produce 243,000 tons of clinkers. Then on November 11, 1997, the new plant went into operation and did not consume any coal but consumed 0.2 billion cubic feet of natural gas along with 700 tons of tires and 900 tons of plastic to produce 46,000 tons of clinkers to the end of the year.

For 1998 this plant will purchase and burn more than 50,000 tons of Utah coal to produce well over 400,000 tons of cement. Small amounts of natural gas will also be consumed along with similar amount of treaded tires and diaper plastics.

Ashgrove Cement

During 1996 Ashgrove Cement expanded operations to increase clinker production by 20-25 percent. The project actually started in 1995 and was completed in the early fourth quarter of 1996. Incorporation of the project into the operation took place in May and June of 1996 when the total clinker producing operation was shut down. During the remainder of 1996 and early 1997 Ashgrove solved the expansion problems but the production did not reach the intended target until June 1997 when Ashgrove decided to increase the capacity of the main fan. Ashgrove also added a 30,000 ton cement silo for more storage capacity. Throughout 1997 additional changes were made improving the clinker production capacity.

With completion of a new waste oil refining unit north of Salt Lake City, the economics of burning waste oil has now totally diminished. The changes made in the configuration of the clinker production system has also made using tires more difficult. During 1997 Ashgrove purchased 101,000 tons of coal and burned almost 103,000 tons in addition to a similar amount diesel fuel in gallons to produce 750,000 tons of clinkers which went into making 931,000 tons of cement. This was 60 percent more than the previous year.

Lime plant operators as well as other industrial entities including Geneva Steel — for its own electric generation — consumed nearly 96,000 tons of coal as well. Industrial coal consumption in Utah should increase by about 11.4 percent from 665,000 tons in 1997 to about 741,000 tons in 1998.

RESIDENTIAL AND COMMERCIAL COAL MARKETS

Out-of-State Markets

Since the mid-1980s when consumption stabilized at about 300,000 tons per year, demand for residential and commercial coal has been on the decline. By 1990, it stood at only 59,000 tons, its lowest level. In 1991, sales to the residential and commercial sector increased to 76,000 tons and in 1992, to 81,000 tons. During 1993, out-of-state consumption jumped by 63 percent to 134,000 tons; by 1994, this sector consumed 308,000 tons. This unusual increase was due mainly to consumption of 193,000 tons by Illinois, which did not buy any Utah coal in 1995 and further decreased to 51,000 tons in 1996, its lowest ever. During 1997 this sector increased to 60,000 tons. Washington and Idaho bought larger quantities. In contrast, Colorado and Nevada purchased relatively small amounts (Appendix, Table 6). Consumption by the residential and commercial sectors in these states will probably increase in the short term, though with some fluctuations. For 1998, a slight increase is very likely.

Utah Markets

During 1997, residential and commercial coal consumption in Utah decreased by 63 percent to 96,000 tons. This level of consumption was by far the lowest in the past 15 years.

In some counties such as Emery, Wayne, Millard, Juab, Sanpete, Sevier and Carbon the number of homes using coal for heating is between 15 to 20

percent. In comparison, the Wasatch Front counties of Salt Lake, Utah, Weber and Davis consume very little coal for home heating. Commercial consumption of coal for space heating in Davis, Weber and Salt Lake counties is also low.

Two elements affect residential and commercial consumption: environmental standards set by various air quality control agencies and the cost of fuel. When the price of natural gas is low there is a strong tendency on the part of the residential and commercial sector to consume more natural gas, but as the price of natural gas increases, the less expensive coal becomes more attractive in spite of environmental consideration. Utah coal producers might not see an increase in consumption of Utah coal by residential and commercial markets unless the price of natural gas increases again. For 1998, coal consumption will have an increase within the state of Utah but could remain the same or could slightly increase in states outside of Utah, resulting in a higher total consumption than in 1997.

Coal Imports

Utah imports coal for coking applications and a coal-fired power generation plant in Uintah County. There are no imports bound for the industrial, residential or commercial sectors. In 1997, companies operating in Utah imported 2.6 million tons of coal.

Utah previously imported low- to mid-volatile hard coking coal to mix with its own high volatile coking coal for Geneva Steel Mill. Since February of 1994, when the coal supply contract between Geneva and Sunnyside Reclamation and Salvage Company expired, Utah has relied entirely on out-of-state coking coal and coke for steel production, thus accounting for the major increase in the amount of imported coal to Utah. Imports of industrial coal to Utah were used primarily at Devil's Slide Plant located in Morgan near the Wyoming border. However, this plant's consumption is now being met by Utah coal, and further imports were ceased in favor of Utah coal. The only other coal import to Utah is about 1.5 million tons of electric utility coal used in Deseret Generation and Transmission's (DG&T) Bonanza Plant.

Bonanza Plant purchased 1.24 million tons of coal from Deserado mine in Colorado and the remaining 0.27 million tons of its requirement for 1997 electric generation also from Colorado. There was no purchase of coal from Utah operators. In 1998, imports will rebound as Bonanza Plant resumes a higher level of electric generation, while Geneva Works' coal imports should stay at just above the 1997 level. Holnam's Devil's Slide Plant purchased a little more than 9,000 tons of Wyoming coal when it switched from natural gas during the second half of 1992. During 1994, this plant purchased 4,000 tons of industrial coal from Wyoming. But, during the 1995-97 period it did not purchase any out-of-state at all. Furthermore, this firm is not expected to purchase any Wyoming coal in 1998.

There is no indication that coal will be imported into Utah for use by the residential and commercial sector in 1998. Altogether, the imports of coal into Utah are expected to increase to 2.8 million tons in 1998 from 2.6 million tons in 1997.

OVERSEAS EXPORTS

Utah's 1996 coal exports to overseas markets of 5.5 million tons which surpassed all previous export records and the second all-time high of 3.811 million tons in 1995 should remain as the respective records for another year.

During 1997 exports fell to 3.5 million tons, just under 2 million tons short of the 1996 export level. This short-fall in the level of exports could partially be attributable to the inability of the transportation sector to deliver coal from the mine to the export terminal.

Utah is uniquely situated in the coal export market. Its low cost, low sulfur and high Btu coal is closer to West Coast ports for shipment to Pacific

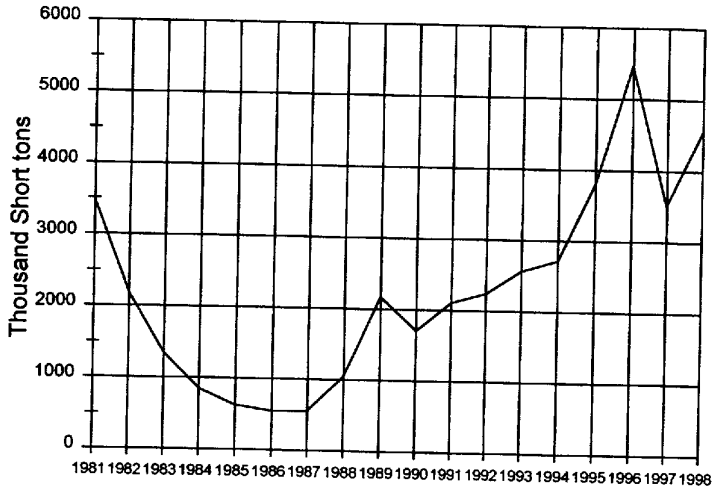
Rim countries than any other U.S. coal source. In the past, U.S. coal exceeded the cost of other coals in the Pacific Rim region, despite offering several quality advantages such as high Btu and low sulfur content. In addition to the coal quality, U.S. coal producers are considered the most reliable, an attribute of Utah's coal that Pacific Rim countries value very highly.

The cost of production and price of Utah coal steadily decreased over the past decade, largely as a result of increased productivity. Because of this productivity, Utah coal is nearly as competitive on a price-per-million Btu basis as coal produced in other countries. By 1995, Utah coal became quite competitive with Australian and other coals in the Pacific Rim. In 1996 the price of coal stayed relatively flat in the Pacific Rim market; indeed a ten cent drop per ton of coal did not have a significant effect. During 1997 Pacific Rim consumers managed to extract a $2.50 concession from the Australian producers. Utah coal producers were hoping to keep their concession below a one dollar level but were not totally successful in that endeavor. The level of concession ultimately matched the average of what the Australian coal producers agreed to and what Utah coal producers were hoping to give.

While the Pacific Rim market was one of the fastest growing markets in the world prior to 1997 the financial problems which surfaced during 1997 signaled a slowing down in the consumption and therefore the generation of electricity.

For 1998 this market should show some sign of strengthening and the export level of Utah coal to Pacific Rim could be raised by one million tons.

Utah Coal Exports to Pacific Rim Countries



1998 value is forecast

Activities of Utah Coal Operators

PacificCorp. Energy West

Energy West Mining Co., a subsidiary of PacifiCorp, had its most productive year of coal mining in 1997. It mined 8.41 million tons of raw coal. Deer Creek mine produced 4.48 million tons of coal. That's up from 4.34 million tons mined in 1996. This increase in production was made even though some adverse mining conditions were encountered during 1997.

1997 saw the second full year of longwall production in Trail Mountain mine. Production totaled 3.93 million tons at Trail Mountain. This is a large increase over 1996 when production for Trail Mountain mines was 3.83 million tons.

Trail Mountain mine coal was shipped by truck to the wash plant near Hunter Power Plant. There it was blended with other stockpiled coal to achieve the desired ash level. When blending alone couldn't produce the desired ash level, a portion of the coal was washed.

Energy West Mining is anticipating another successful mining year in 1998 with production continuing at or above 1997 levels in both Deer creek and Trail Mountain mines.

Canyon Fuel Company, LLC

For the second time in less than two years, the owner of the former Coastal States Energy Company mines announced that they no longer considered coal to be part of their core business. As a result, on April 2, 1997, ARCO Coal Company surprised many with the announcement that they would either sell or spin off their substantial coal holdings in both the Western United States and Australia, including their 65 percent ownership in Canyon Fuel Company, LLC (the former Coastal mines). The sale of the Western US properties to Arch Coal, Inc. was completed June 1, 1998. Arch Coal was formed on July 1, 1997, through the merger of Ashland Coal, Inc. of Hunting, WV and Arch Mineral Corp. of St. Louis. Arch has grown quickly from a mid-sized Eastern US Coal company to the United States' second largest producer of coal (110 million tons during 1997 with 9.4 percent of the domestic total, on a pro forma basis) and now has more revenues than any other US coal company ($1.8 billion in 1997, again on a pro forma basis).

Arch was previously the largest Eastern US producer of low-sulfur compliance coal. With the ARCO acquisition, Arch is now the third largest producer/shipper of compliance coal in the United States with coal shipments to 149 power plants in 30 states.

For 1997, Canyon Fuel Company produced and sold approximately 10.4 million tons of Utah compliance coal to both domestic and export consumers. Canyon Fuel coal moved not only into the traditional Western coal markets, but substantial tonnage was shipped to Midwestern utilities. With implementation of Phase 2 of the Clean Air Act Amendment, Arch expects that this compliance coal market will continue to expand and open new opportunities for Canyon Fuel's Utah coals.

White Oak Mining and Construction Company, Inc.

In 1997, White Oak produced approximately 886,000 tons of clean coal from its No. 2 mine. The coal was shipped to Eastern and Western customers as well as to the export market. The coal was produced from both the Upper and Lower O'Conner seams out of the No. 2 mine since faulting makes access to both seams possible.

Due to poor ground conditions encountered in the No. 2 mine during the summer of 1997, White Oak opened the No. 1 mine in September and idled the No. 2 mine in November, 1997. While the No. 2 mine is idle, work will be completed upgrading the mine's infrastructure, installing additional roof support, and sealing off areas of the mine. Production from the No. 2 mine is predicted to resume in mid-1998. This change in mining areas necessitated a reduction in the work force at White Oak -

from 115 in January, 1997 to 51 in December, 1997.

In December, 1997, White Oak was granted a lease modification from the BLM that added approximately 160 acres of coal reserves to the southern leases to enable mining to progress towards the outcrop of the O'Conner seams.

White Oak continues to evaluate the southern and eastern areas of it's leases for future production needs.

Horizon Mining, LLC

Horizon Mining, LLC was formed in August 1997 to operate the Horizon Mine which is located in Consumers Canyon near the site of the old mining operations of the Blue Blaze and National mines.

Work progressed during the fall of 1997 on the three rock slopes to access the Hiawatha seam, development of the bottom area of the mine, and construction of the surface facilities.

Coal production had been planned to commence in early 1998 with the development of the North Mains.

Andalex Resources, Inc.

Andalex concentrated its effort in 1997 on development and production of coal from Aberdeen mine and the design and permitting of the West Ridge mine.

The Pinnacle mine and Apex mine remained inactive during 1997. All Andalex's effort was directed toward production from Aberdeen mine. Three continuous miners were used for the development of gate roads and mains and a longwall was used to produce a total amount of 1.87 million tons of coal. The longwall panel was moved once during 1997 which was in January. During 1998 it was moved again, this was in February.

Genwal Resources, Inc.

In 1997 Genwal Resources, Inc. produced 2.7 million tons of coal. Work toward increasing the production to 3.5 million tons annually was nearly completed. The production increase was based upon two actions, one was purchasing a new longwall, which would allow mining thicker coal seams. The other was constructing a new truck loadout at the mine, removing a bottleneck.

In 1997, the new longwall was purchased and put into operation in September. Construction on expanding the surface facilities, including a new truck loadout, began in July. The new surface facilities were fully operational in January 1998.

The acquisition of additional reserves in the Mill Fork Lease Application has been delayed with the proposed swap of state coal lands in the Grand Staircase/Escalante National Monument for federal coal lands outside of the monument.

The market for Genwal's high quality coal remains to be power plants, cement plants, and exports.

Co-op Mining Company

Co-op Mining Company was started in 1940 and has operated continuously for the past 58 years. Co-op is an independent coal producer of lower sulfur, high Btu coal. Co-op operated in the Bear Canyon near Huntington, Utah. Annual production in the last several years has been 400,000 to 500,000 tons per year. 1998 tonnage is projected to be approximately 650,000 tons. Co-op's marketing has been directed at industrial consumers, households and Utah & Nevada utilities, with additional tonnage sold to the Midwestern market east of the Mississippi.

Co-op controls in excess of 30 million tons of coal reserves consisting of private, fee and federal coal. Approximately 75 percent of the reserves are private and fee coal. The balance consists of federal coal. The reserves are located east and west of Bear Canyon. Current mining operations are west of Bear Canyon.

There are three minable seams on the property. They are the Tank, Blind Canyon, and Hiawatha Seams. The Tank Seam is the top seam, the Blind Canyon Seam the middle, and the Hiawatha Seam the bottom. Co-op is presently mining in the Tank Seam. Seam thickness varies between 12' - 20' in the Blind Canyon, 5' - 9' in the

Hiawatha and 8' - 10' in the Tank Seam. Bear Canyon mine operates continuous miners and shuttle cars, and has the capability to run three sections. At the present time two sections are in operation. Present mining equipment would allow production of up to 1 million tons per year.

A modern screening facility, which allows participation in the industrial market for oil treated stoker and household coal, has been installed at the mine site. Co-op has the ability to ship unit-train shipments of up to 120 cars. The facility is designed to load 100 cars in less than 2 hours.

Cyprus Plateau Mining Company

Cyprus Plateau Mining Co., produced coal from two operations in 1997; the Star Point No. 2 mine in the Wasatch Plateau and the Willow Creek mine in the northern Book Cliffs Coal Field. Both operations continued to market high quality steam and industrial grade coal products for the western United States and the Pacific Rim export market.

Both operations were in transition in 1997 with the Star Point mine mining its last longwall panel during the year and Willow Creek mine developing the first gate roads to house a complete new longwall unit. After evaluation, two high production room and pillar continuous miner sections were initiated at Star Point to supplement lost longwall production. These sections were developed in areas adjacent to previously mined panels and utilized flexibility and aggressive mining practices to achieve high levels of productivity.

During this time, new facilities at the Willow Creek mine were completed and occupied, major underground conveyor structure installations were completed, and extensive geotechnical (methane desorption and in-situ horizontal stress monitoring) studies were completed. However, in-seam rock splits (splays) encountered in the latter part of the year delayed advance until late year when all sections had advanced back into thick coal. As planned, the new longwall will initially mine coal in the D Seam for about five years and then move to the adjacent underlying Kenilworth Seam and then on to the A Seam. Extensive reclamation was also done on pre-existing old Castle Gate mine works on the west side of the Price River Canyon.

Coal Leasing Activity in Utah

White Oak Coal Company

During 1997 there was no coal lease sale in Utah. There was however one coal lease modification in December 1997 when 160 acres of coal property adjacent to White Oak mine was sold to While Oak Mining and Construction Company. During 1998, to date, there has been only one federal coal lease sale in Utah.

Horizon Coal Co.

On August 10, 1995, Horizon Coal Corporation of Wise, Virginia applied for a lease by application (LBA) covering an area of 1,280 acres in Township 13S and Range 8E, covering all or parts of sections 6, 7, 8, 17 and 18, containing 8 million tons of coal. The National Environmental Policy Act (NEPA) compliance document for Beaver Creek Tract was prepared by a third party contractor.

In a public auction which was held on May 14, 1998 for the sale of 1,288.49 acres of Beaver Creek Track, Horizon Mining LLC's bid of $315,000 was accepted. The lease which was offered for sale was located in Carbon County, Utah, approximately 15 miles northwest of Price, Utah; and, was delineated as follows:

T, 13 S., R. 8 E., SLM, Utah
Sec. 6, SESW, S2SE, NWSE;
Sec. 7, lots 1-3, E2, E2W2;
Sec. 8, SWNE, NWNW, S2NW, N2SW,
SWSW, W2SE;
Sec. 17, N2NW, SWNE;
Sec. 18, NENE.
Containing 1,288.49 acres

One economically recoverable coal bed, the Hiawatha Seam is found in this tract. The seam averages 6.7 feet in thickness. This tract contains an estimated 6.3 million tons of recoverable high volatile B bituminous coal.

The lease was sold at $245 per acre or 5¢ per recoverable ton of coal. This lease was essential for Horizon as their previous lease holding was sufficient for one year of operation, now they can operate for 10-15 years during which time they can build up their reserve base by purchasing more federal coal leases.

Genwal Resources, Inc.

On February 4, 1993, Genwal, which is now a 50/50 subsidiary of Intermountain Power Agency (IPA) and Andalex Resources, filed an LBA for 4,051 acres of federal coal leases covering all or parts of sections 1, 10, 11, 12, 13, 14 and 15 of Township 16S and Range 6E and sections 6, 7 and 8 of Township 16S and Range 7E, called Mill Fork Canyon, on land adjoining its presently operating mine and the previously purchased LBA. Since there was some unleased federal coal east and south of Genwal's application area that should have been added to the LBA to avoid a bypass situation, the Tract Delineation Team considered it prudent to add these areas to the tract being offered for auction. Originally Genwal did not include this area in its LBA because of the quality of coal, seam thickness and possible environmental concerns associated with hydrology and escarpment protection existing in the area. Studies conducted by the Forest Service in years previous to the submission of the application concluded that the aforementioned land could be leased. The environmental analysis for the tract based on the presently available information will determine the feasibility of leasing the delineated tract. The final proposed tract to be leased will contain 6,442.82 acres covering all or parts of sections 1, 10, 11, 12, 13, 14, 15, 22, 23 and 24 of Township 16S and Range 6E and sections 4, 5, 6, 7, 8, 9 and 18 of Township 16S and Range 7E, containing 68 million tons of recoverable coal in Blind Canyon Seam and Hiawatha Seam. This LBA may go out for bid late this year.

PacifiCorp Electric Operation

PacifiCorp Electric Operations (Utah Power) of Salt Lake City submitted an LBA on February 26, 1991, for 7,864 acres in the North Trail Mountain/Cottonwood Creek area of Wasatch Plateau coal field in Emery County covering all or parts of sections 2, 3, 4, 9,

10, 11, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32 and 33 of Township 17S and Range 6E. This application is in full conformity with responsible and prudent coal operation.

In reviewing this LBA the Tract Delineation Team noted some areas where adjustments could be made in the tract configuration. The western edge of the tract in some areas was identified by the Forest Service in their forest plan as being unsuitable for coal leasing because of the need to protect the escarpment along Joe's Valley. However, they recommended the inclusion of additional land to fill the gap left between the LBA and their existing leases. As a result the recommended tract by the Tract Delineation Team, the Cottonwood Canyon Tract shall include all or parts of sections 2, 3, 4, 9, 10, 11, 12, 13, 14, 15, 16, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32 and 33 in Township 17S Range 11E, in total 9,243.87 acres containing 75 million tons of recoverable coal. Since the EIS for this was going to take some time to be completed by the public sector there was an offer by BLM to PacifiCorp to allow the study to be conducted by a third party. This tract could go on sale in early 1999.

Canyon Fuel Coal Co.

On December 16, 1996, Canyon Fuel filed for a LBA covering an area of 5,858 acres of federal coal leases named "the Pines" in Wasatch Plateau coal field. The requested lease contains some 50 million tons of coal existing in all or parts of sections 35 and 36 of Township 20S and Range 5E, and sections 1, 2, 3, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25 and 26 of Township 21S and Range 5E. Delineation of the tract is being finalized and the lease will go to auction late 1998 or early 1999.

Also, in 1998, Canyon Fuel Company LLC submitted a lease by application for 2612.16 acres of federal land called Flat Canyon Tract. The lease covers all or part of Section 21, 28 and 33 of Township 13S, Range 6E and all of Section 4 and 5 of Township 14S Range 6E. The field operation by BLM for this application is underway.

Andalex Resources

During March 1997 Andalex Resources purchased B Canyon coal reserve from BP America, a British Petroleum subsidiary, and started the process of permitting the mine. Andalex plans to have the mine producing coal in the year 2000 from a longwall operation which should be producing at a minimum rate of 3 million tons per year. B Canyon reserve (renamed West Ridge) should increase Andalex's reserve of recoverable coal by at least 40 million tons.

AMCA Coal Company, the leasing agent for Andalex Resources, filed for a LBA in July 1997 for 1,600 acres of federal coal lease property existing in all or parts of sections 1, 3 and 12 of Township 14S and Range 13E, and sections 6, 7 and 18 of Township 14S and Range 14E, and section 35 of Township 13S and Range 13 E, containing some 10 million tons of recoverable coal. This LBA, called Bear Canyon, is adjacent to the above mentioned lease. The BLM is now collecting baseline data and consulting with Andalex to find the best way to accomplish NEPA compliance. The sale of this tract is still in the distant future.

On May 20, 1998 Andalex Resources Inc. submitted its final version of emergency lease by application for 462.73 acres of federal land by the name of Summit Creek Tract. This land is contiguous with an existing federal lease held by Andalex covering all or parts of Sections 29, 30, 31 and 32 of Township 12S and Range 11E.

Outlook for Utah's Coal Industry

FORECAST FOR 1998

Prices

Over the past 13 years, coal prices in Utah have declined. In 1984 Utah coal, on average, sold for $29.20 per ton. During 1997, the same coal sold for $18.32 per ton. This represents a decrease of 37.2 percent in current dollars, but a decrease of almost 59 percent on a constant dollar basis.

From 1990 to 1993, average prices fluctuated around $21 per ton and hit a new low of $20.07 in 1994. In 1995, another new low was established at $19.11 then another one in 1996 at $18.50 and finally still another low in 1997 at $18.32. Even though this appears to be a decline in coal prices, in reality, it is not.

The increase in sales occurred mostly in markets which were at the lower end of price scale while some reduction of delivery occurred in markets which were at the upper end of the price scale. This, therefore, indicates a possible "bottoming out." In the near term, the average price will most likely remain stable; for 1998, the average price of coal will probably be about $18.51 per ton.

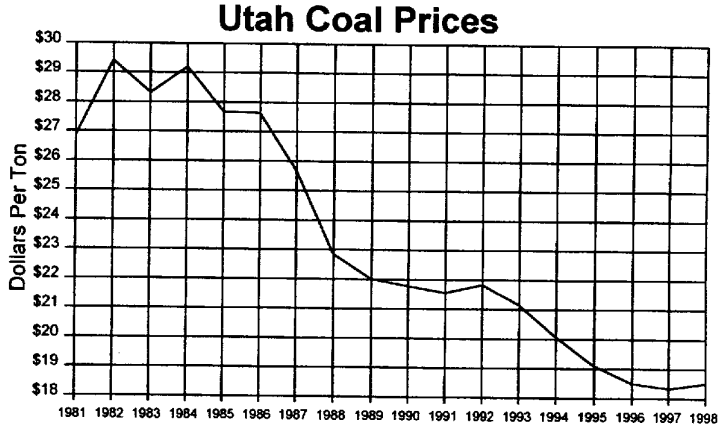
The average spot price of coal stood at $14.33 during the 1996 period, fluctuating between $13.50 and $15.07, started to rise during the first quarter of 1997, and ended the year at $16.63 per ton for an average value of $16.51. During the first quarter of 1998 the spot price of Utah coal was around $16.70. The firming up of the spot price had more to do with the supply than the demand.

During 1998 Utah coal production will likely increase by 2.0 million tons, from 26.4 to 28.4 million tons. This could lead to some softening of the spot prices though we do not believe it would go below $16.50 per ton.

Skyline production should increase by more than 10 percent. White Oak's production could experience some decrease as Horizon Coal came on line. Soldier Canyon, Andalex and Co-op should stay relatively stable. Plateau, should have the highest increase which could be as much as 40 percent. Genwal should experience a good increase in production which could reach as high as 20 percent. Finally, Sufco should have a moderate increase of around 5 percent.

The current dollar prices will start moving up after 1997; however, the price of coal as measured in constant dollars is expected to continue to fall slightly. In other words, even though the average dollar price per ton will accelerate, the rate of increase should not exceed the rate of inflation.

Utah's spot coal price changes are not only a function of demand changes or Utah's coal supply but also a function of



1998 value is forecast

the availability of coal in the neighboring states, more importantly Colorado. Just as much as Cyprus' Twenty Mile mine production problems contributed to the tightening of Utah's spot prices in 1996, an existence of over supply in Colorado could play a part in softening the spot price of Utah coal.

It is important to bear in mind that Utah's coal prices are also influenced by the world price of coal. The correlation may not be high, but the existence of a strong influence cannot be denied. During 1996 world coal prices remained relatively flat but started to fall off in 1997. Coal operators in Utah agreed to a concession of one-dollar-plus per ton. In 1998 there was another concession of about one dollar per ton of coal exported to the Pacific Rim countries of Japan and Korea. However, the contract with Tai Power may be such that the concession made to Japanese coal importers would not affect it materially. Other countries such as Australia and South Africa gave concessions ranging up to $3.00 per tonne (metric ton).

Even though the Australian exporters may have given concessions amounting to $3.00 per tonne this may not be as severe as it seems because all export contracts in Japan are written in U.S. dollars. As Australian dollars devaluates with respect to U.S. dollars the amount of Australian dollar received from the Japanese importers increases there by defraying the effect of the previously agreed upon concession. If the FAS price of Australian coal goes from $37.00 to $34.00 per tonne but the Australian dollar devaluates by 9 percent the actual Australian dollar received by them will be greater.

Though export prices for Utah producers were not a determining factor in overall coal prices, and the sale takes place on marginal production, it should be realized that as the amount and the percentage of the exported coal relative to total production increases, the effect of the export price on the average price of coal becomes more relevant.

Other factors also tend to soften prices. Technological developments in coal production and handling continue to lower the break-even point for production and to reduce prices overall. Large volume production allows operators to reduce profit margin per ton by lowering prices and still keep overall profit high. The abundance of coal supply on the international market will continue to exert pressure on Utah producers to keep prices competitive.

World recoverable coal reserves stand at 1.131 trillion tons. World production and consumption is around five billion tons per year implying that, at the present rate of consumption, the world has an adequate supply for the next 226 years. This, of course, is based on the recoverable reserves that are known and reported at this time. There are many coal reserves that remain undiscovered and some that are discovered but not reported or are underreported.

There is also some question about the "recoverable" fraction of the recoverable reserves. By "recoverable" we refer to resources that we can mine efficiently with today's technology. However, future technology may allow a greater percent of the resource to be recovered, hence a much greater recoverable reserve.

The rate of consumption also directly affects the remaining number of years of supply. As the world's population increases, the demand for energy, including coal, will increase. As developing countries with high growth rates expand and add energy-intensive industries, the demand for energy and coal will increase in tandem. Presumably, at the same time, new technologies will help us achieve much greater efficiency in our energy conversion. Today, on average, we burn 10,080 Btu (0.84 lb. of 12,000 Btu per pound of coal) to generate 1 kWh of electricity which has 3,413 Btu. In other words, in the process of conversion we lose 6,667 Btu or 66.1 percent and end up with 33.9 percent of the energy used. Sierra Pacific's

Pinon Pine Power Project is now operating at about 40 percent efficiency. By the first decade of the next century, many of our energy conversion units will have a heat rate of 6,800 Btu/kWh or slightly more than 50 percent efficiency. This, in reality, means that by the first decade of the next century we should be able to use the same amount of coal to generate 50 percent more electricity than we do today, implying that our reserve-to-production ratio will increase, thus extending the life of our reserves. This leads to the conclusion that the world has a vast coal reserve and this supply overhang will ultimately keep the supply up and the price down.

On the other hand, there are also other forces acting to move the price of coal up, specifically western coal. As we approach the year 2000, when the second phase of the Clean Air Act Amendments of 1990 becomes effective, we will experience a renewed wave of interest in low sulfur coal throughout the country. From mid-1998 into 1999 we should see some strong interest in western coal again. Utah's coal production, now at the upper percentage of capacity, should respond to the greater demand by showing some firming up in the price of coal.

Production

Utah coal production for 1998 will surpass 28 million tons, reaching an all-time high in the industry's 129-year of recorded history. Three factors will account for the record: 1) greater steam coal consumption by the electric utilities in the east; 2) greater level of exports; and 3) increased industrial consumption of the coal in the west. All this however is contingent upon one factor and that is the ability of the transportation sector to deliver the coal to the intended destination.

Electric utilities in the west as well as electric utilities in the east will continue using greater amounts of Utah coal in the years to come. In 1998, shipments of coal to electric utilities in the east will increase by 86 percent while shipments to the west will go up by only 4 percent. In addition, shipments to Pacific Rim countries will increase after the completion of the $180 million expansion of the Port of Los Angeles Dry Bulk Terminal.

In June 1995, the Phase II design and engineering contract was awarded to Jacobs Engineering Group, Inc. of Pasadena. Coal will be unloaded from unit trains by tandem railcar dumper and stockpiled by an overhead traveling stacker. Pile activators and belt conveyors will then reclaim the coal and convey it over land to the ocean-going vessels. This project, which will initially handle seven to eight million tons of coal per year, is now completed. The success of this terminal is virtually guaranteed in light of the diversity of shareholders representing every facet of the coal market including coal producers, transporters and consumers. Industry analysts believe consumption of Utah coal will increase by 30 percent in 1998 and could reach six million tons by the end of the decade.

Distribution

During 1998, distribution of Utah coal most probably will surpass 29 million tons while production will top 28 million tons. Distribution of electric utility coal to out-of-state customers will increase by as much as 2.3 million tons from 5.6 to 7.9 million tons.

On January 1, 1995, TVA and White Oak Mining and Construction Company, Inc. signed a ten year contract for annual delivery of 1.5 million tons of coal per year. Another 10-year coal contract for delivery of one half million tons per year was signed on the same date between TVA and Genwal Coal Company. This was the first time in a decade that Utah coal started to flow to electric utilities in the east on a long term basis even though numerous spot sales had been made to that sector of the country.

This two million tons of additional coal through 2005 was a boost to Utah's coal production. It will lead to more jobs in Utah's coal industry as well as many indirect jobs in

local communities. In addition to TVA Utah now has two companies sending coal to two electric utilities in Illinois. There are also other companies sending electric utility coal to Pennsylvania and Wisconsin. Our forecast for the first decade of the 21st century shows that electric utility coal going east should be above 5 million tons per year.

Distribution of Utah coal to electric utilities within the state should show very little year-to-year change, unless new facilities are built or some of the older units are retired. Currently, there is no indication that either will happen. Older units experience more down-time due to maintenance and repair, so a slight decrease in distribution is expected; however companies could increase their electric generation marginally by ramping up their operation. The only unit that could materially affect electric utility coal consumption within the state is Intermountain Power Agency's IPP plant. During years with higher precipitation in the Pacific Northwest, more hydropower becomes available at costs below those of coal. This will, to some extent, curtail the operation of IPP units resulting in less consumption of Utah coal. For 1998, this unit will purchase and burn about 0.1 million tons more than it did in 1997. PacifiCorp distribution will also increase by another 0.15 million tons while the consumption of coal and generation of electricity at the plants increases. DG&T's Bonanza Plant is not forecasted to use any Utah coal in 1998. During the first decade of the next century, the electric utility sector's consumption of Utah coal within the state should increase from 13.27 in 1997 to close to 14.0 million tons per year.

Distribution of Utah industrial coal within and outside the state during 1998 will increase by almost half a million tons, increasing only slightly in the future as only out-of-state consumption increases. This trend should continue through the first decade of the 21st century.

Distribution to the residential and commercial sector will also increase during 1998. However, any movement in this consuming sector is ultimately tied to the price of natural gas. Some commercial operations may begin switching from natural gas to coal which should result in increased coal consumption.

Finally, in the export market during 1998, distribution will increase by about 30 percent, or more than one million tons to 4.6 million tons. The forecast for this consuming sector for the first decade of the next century is above ten million tons per year.

The general outlook for Utah's coal industry is bright despite some coal operators having moved their operations to other states, sold, or otherwise disposed of their Utah coal properties. Still we have seen a number of companies expand operation and double in size within a span of three or four years. Many companies have applied for new federal coal leases, indicating continuing interest in Utah's coal reserves. Finally, a new mine opened in 1996 and another in 1997, an activity that bodes well for the future of Utah coal. This likely is the beginning of many more mines opening in Utah as some of the older mines curtail operation and relocate to new locations.

Coal production in Utah has enjoyed steady growth since the mid-1980s and has more than doubled in size within the past decade. Despite coal prices that have declined steadily for a decade, coal production in Utah has increased. This is indicative of a strong and healthy coal industry.

In 1998, all consuming coal sectors within and outside of Utah are expected to have moderate growth. The coal contracts with eastern utilities should add permanence to electric utility consumption outside of Utah. The forecast of total production for the first decade of the 21st century is about 36 million tons.

Federal, Legislative, and Other Issues

• Electric utility deregulation undoubtedly will set in motion forces, by far much greater than any in the previous decade, which would affect the coal industry-electric utility relationship. These forces will not necessarily be detrimental to the coal industry and they might even be favorable. As the electric utility industry starts to reshape itself for better positioning in the new changing environment the coal industry has to adjust itself to these new changes. A new trend of vertical integration may emerge as we have seen recently being initiated by the PacifiCorp tender offer for the Energy Group, one of whose holdings is Peabody Coal Company. This action owes its impetus to electric utility deregulation. Zeigler Coal Company is also on a similar path. Before long we should observe other mergers and integration which should add to the momentum of streamlining. Natural gas will invariably become a part of this equation. Whether it is on the basis of pure economic forces or environmental regulation we should see a greater participation on the part of natural gas in the energy mix. The coal industry may not have to carry the entire burden of this greater use of natural gas. Other resources in the energy mix might carry their own share.

There is no doubt that change is imminent and the better the coal industry prepares itself and welcomes the change the more successful the industry will be in years to come. These changes are not restricted to the electrical utility, coal or natural gas industries but may also affect the railroad industry. Most of the one billion plus tons of coal produced in this country is moved by railroad. If the railroad industry does not reduce its costs, coal may lose market share to natural gas, something that neither the coal industry nor the railroad industry can afford.

There are two schools of thought as to which energy sector, natural gas or coal, would emerge as the more predominant in the new deregulated environment. Natural gas has the advantage of being cleaner and emitting less CO2 for delivered Btu than coal. The reserves of natural gas available for electricity generation are abundant and more people believe in its value than ever before. Coal on the other hand has always been abundant and its lower price per delivered Btu has always sustained its attractiveness worldwide. Fuel switching in favor of natural gas will decrease coal consumption to some extent. The use of more natural gas would not however significantly erode the total tonnage consumed. On the other hand clean coal technology, a multi-billion dollar government-industry cooperation, has come a long way in ensuring the greater use of coal-fueled electric generation.

The new technology would reduce the SO_2 and NO_x emission and, by increasing the efficiency in thermal conversion into electricity, would reduce the CO_2 emission per unit of generated electricity. These lower levels of emission combined with our willingness to rethink and reinvent a new workable relationship between the coal producers, electric utility generators, and the transportation sector would go a long way in decreasing the price of coal-based electric generation and guarantee a flourishing future for a more environmentally friendly coal industry.

The electric utility-coal industry relationship has been evolving over the past decade and a half by expanding the parameters of product specification, increased price flexibility, and shorter term contracts as well as relying more on spot markets. This mutually beneficial relationship is now a prelude to much more proactive and inspired initiatives. The impetus of change is here and we have only two choices. Either we can act or react. If we wait too long or try to react toward the changes we might come out on the losing end. The only way to come out ahead is to act with decisiveness now. The representatives of the coal industry

should start to think and chart their way through the possible mergers, integrations, and other forces shaping the industry in order to create an environment in which not only we can survive but also thrive. We should be willing to move ahead taking initiative to guarantee our future success rather than wait and try to react toward the new emerging industrial environment.

Grand Staircase-Escalante National Monument Task Force

• On September 18, 1996, President Clinton declared 1.7 million acres of Central Southern Utah the "Grand Staircase-Escalante National Monument." This monument was left in the care of the Bureau of Land Management (BLM) to develop a management plan, working closely with the state of Utah.

A task force was later organized with headquarters in Cedar City. On the state side, the task force included a geologist (from Utah Geological Survey), a wildlife biologist (from Division of Wildlife Resources), a paleontologist (from State Parks), an economist/planner (from the five-county Association of Governments) and a historian/social anthropologist (from University of Nevada assigned through Utah Travel Council), working closely with a number of BLM employees in similar capacities.

The main purpose of the task force is to identify the scope of activities to be conducted within the monument's boundary in order to preserve Utahns' rights and honor the valid existing rights of those who possessed it before the declaration of the monument. One task the BLM has responsibility for is the exchange of land belonging to School and Institutional Trust Lands Administration, which is interspersed within the 1.7 million acres, with other lands outside of that designated area.

It is the policy of BLM to carry out this land exchange on an equal value basis. This policy is something that requires further review, discussion and negotiation and, at this time, is beyond the scope of this report. In any case the BLM policy is something that should not be taken as given and is definitely worthy of a serious review.

Usually, independent appraisers are hired to determine the value of the land subject to exchange. One of the factors that affects how independent appraises determinate land value is the presence of minerals.

Kaiparowits coal field which, according to a recent USGS study, contains 62 billion tons of in-place coal, is located mostly within the monument. To assess the value of this coal reserve BLM hired BXG, Inc., a Colorado coal consulting firm, in January 1997. BXG issued their findings in March 1997. Mr. David Tabet of Utah Geological Survey and F.R. Jahanbani of the Office of Energy and Resource Planning, conducted a detailed review. On the basis of this analysis, the Department of Natural Resources (DNR) concluded that the report seriously underestimates the extent and quality of the Kaiparowits coal field. Some of the points which DNR questioned are listed below.

• BXG's estimates of recoverable reserves contained on Kaiparowits Plateau were based on recovery rates of coal resources in Appalachian coal fields of the eastern United States. On this basis, they calculated that Kaiparowits coal fields contained between 4 billion to 6 billion tons of recoverable coal. DNR emphatically challenge BXG's use of Appalachian coal fields as an indicator of recovery rates that could be obtained by mining coal on Kaiparowits Plateau.

Due to more favorable geology of the Kaiparowits coal fields (such as seam thickness and more horizontal geometry of coal seams, and the use of more advanced longwall mining technology), it is our opinion that the BXG study underestimates economically recoverable coal reserves by at least one-half.

Present longwall mining techniques recover up to 70 percent of a given seam. By applying a very conservative recovery rate of a little over 30 percent, as suggested by

Doelling and Smith (1982)[2], to over thirty billion tons of minable coal in various beds, we believe a more accurate estimate of economically recoverable reserves would be 11.3 billion tons. At least 6.75 billion tons of this are high-Btu, low-sulfur coal. In addition, the average coal quality of the Tropic and Escalante areas suggests additional recoverable reserves of compliance coal exist

• The most troubling assumption BXG incorporates into its market analysis is the assignment of an average coal quality for the entire Kaiparowits Plateau coal field. According to their report, average coal quality in Kaiparowits is estimated at 0.73 percent sulfur and 10,400 Btu/lb. BXG observes that this is significantly lower than Utah's current average for compliance coal produced on Wasatch Plateau of 11,671 Btu/lb. and 0.47 percent sulfur. In doing so, BXG fails to differentiate between distinctly different coal qualities of the three regions (Tropic, Escalante and Smoky Mountain) that comprise the greater Kaiparowits Plateau coal field.

Averaging the coal quality across the entire plateau dilutes the quality of Smoky Mountain coal field. These recoverable reserves total 6.75 billion tons and average 11,207 Btu/lb. and 0.68 percent sulfur, ranking these reserves as a high-Btu compliance coal. Coal companies would view these reserves as the most logical target for initial future development.

By averaging coal quality across the entire Kaiparowits Plateau, BXG draws a blanket conclusion that Kaiparowits coal is disadvantaged on the basis of lower coal quality. This is not the case. Comparisons with the quality of coal mined on Wasatch Plateau and Book Cliffs indicate that coal from Smoky Mountain coal field exhibits Btu and sulfur attributes that are comparable to compliance coals from these areas in central Utah.

• The BXG report also developed estimates for production costs in order to evaluate market potential vis-a-vis other Utah and Colorado mines that produce high-Btu, low-sulfur coal. Using historical data from underground coal mines in the West and BXG's coal mine cost model for Utah, a series of cost estimates were prepared for a generic longwall mine on Kaiparowits Plateau. According to the model, a mine at this location producing 5 million tons per year would require a sale price of $16.87 FOB mine to be economically viable.

Again, a number of inaccurate assumptions were used by BXG in their analysis. The result is that their model reports operating and capital costs for mines in Kaiparowits Plateau coal fields that are higher than we believe the costs are likely to be.

First, for purposes of comparison, the relevant coal field is the higher quality coal of the Smoky Mountain area of south Kaiparowits, not the entire plateau. Second, mine operators in Smoky Mountain coal field are likely to have higher rates of productivity than reported by BXG. BGX assigns a labor productivity rate to the Kaiparowits cost model that is based on data from all Western longwall coal mines between 1990 and 1995.

Utah's underground coal mines are the most productive mines in the entire U.S. The geology of Smoky Mountain coal field would tend to make new mines even more productive than mines in central Utah and much more productive than all other longwall operations in the Western U.S.

Third, the thick, flat nature of Kaiparowits coal beds and their shallow over-burden would result in lower costs for roof support and minimize operational down-time required to move longwall equipment. The lack of previous mine workings will lower development costs associated with constructing long entry tunnels to

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[2]*Overview of Utah Coal Fields, 1982, in* Gurgel, K.D., ed., Proceedings Fifth Symposium on the Geology of Rocky Mountain Coal 1982: Utah Geological and Mineral Survey Bulletin 118, p. 1-30. H.H. Doelling and M.R. Smith, 1987.

work around old workings.

Finally, the non-gaseous nature of the coal seams would reduce the cost required for more extensive ventilation systems typically required in central Utah's coal fields. These factors, including higher productivity and lower development and operating costs, will lower the costs of mining coal in Smoky Mountain coal field on Kaiparowits Plateau. BXG states in their report that the models were run using a contingency factor of 20 percent, a relatively conservative estimate compared with the 10-percent factor typically used for Utah mines.

Based on DNR's analysis of their assumptions, BXG's use of an additional 10 percent contingency expense in their Kaiparowits cost model is not justified. Using assumptions that more accurately reflect likely mining conditions, expected FOB mine costs of a ton of coal mined from Smoky Mountain field will be lower than BXG's estimate by a minimum of $2 per ton.

• Another weakness of the BXG report is its estimate and comparison of transportation costs. The BLM's consultant estimates the cost of transporting a ton of coal to a rail load-out facility in Utah to be 7.5 cents per ton-mile. In New Mexico and Arizona, where truck hauling would be required to a railhead at Flagstaff, the BXG report assigns a truck transportation charge of 10 cents per ton-mile. According to transportation companies, a more accurate figure for coal haulage cost for proposed mines in the area would be 20 to 25 percent lower. Accordingly, the BXG report overestimates the transportation costs of a new mine in Smoky Mountain coal field by 25 to 33 percent.

• Forecasts developed by BXG for markets currently supplied by Utah coal mines project demand to rise from 28 mmtpy in 1996 to 35 mmtpy by 2015. By analyzing projected production from existing mines, mine expansions and planned new mines in central Utah, BXG reports that future demand can be supplied by Wasatch Plateau and Book Cliffs until 2018. Therefore, they conclude it is unlikely that a lower quality, higher delivered cost product (Kaiparowits coal) could compete in this market before 2020.

DNR took issue with a number of assumptions that underlie the BXG analysis of future demand for Utah-produced coal. First, forecasts of demand by DNR's Office of Energy and Resource Planning (OERP) exceed BXG's by an average of 2.7 mmtpy between 1996 to 2020. Underestimating demand has significant impact on the timing of reserve depletion at existing Utah mines, which in turn retards the time frame under which new sources of coal will need to be found. OERP's forecasts suggest demand will outstrip central Utah production by several million tons starting in 2015 when reserves at Skyline and Willow Creek mines are projected to be exhausted. At this time there will be a need for a new coal supply. Based on an evaluation of coal quality and estimates of cost of production, OERP projects that coal from the Smoky Mountain area of Kaiparowits Plateau would be a viable source of coal supply by as early as 2014, six years earlier than forecasted by the BXG study.

Second, DNR also disagrees with BXG's characterization of utility demand for Utah coal. BXG estimates utility and industrial demand falling from 22.4 mmtpy in 1997 to 15.2 mmtpy by the year 2003. While this represents a significant decline of over 32 percent, BXG provides no justification or explanation of the assumptions that underlie this decline.

• BXG has gone to great lengths to establish a case against Kaiparowits coal as an economically viable source of supply for steam coal markets. The BXG report concludes that while sufficient reserves exist to support mine development on Kaiparowits Plateau, lower average quality coal and higher production and transportation costs will keep this coal out of the current term contract and spot markets and will hamper future efforts to establish a market for this coal until central Utah coal fields are mined out.

Debate about whether Kaiparowits coal is economical - given current market conditions - is not relevant to the fact that central Utah coal reserves are in decline. As supplies tighten and costs of production increase in the future, Kaiparowits coal will become increasingly competitive with mines in central Utah. DNR's critique of the BXG report demonstrates that coal mined from Smoky Mountain coal field of Kaiparowits Plateau is of sufficient quantity and quality to make it a major player in the future coal supply market of Utah. This coal field is likely to have production costs that could make it an economically viable source of supply for many Western utility and industrial coal markets within the next few years and certainly by 2014.

• The land exchange agreement which was unveiled on May 8, 1998 by Secretary of the Interior Bruce Babbitt and Governor Mike Leavitt of Utah was indeed a long awaited one. It was, no doubt, the designation of the Grand Staircase - Escalante National Monument by President Clinton on September 18, 1996 that gave the additional impetus to culminate this federal government/state land exchange that had been in the process of negotiation for many years, if not decades.

This agreement encompasses the exchange of state land, tribal land, federal land, mineral rights on state land, tribal land, federal land as well as royalties on minerals and lump sum payment in cash. As part of the exchange the federal government will receive:

- $177,956.72 acres of surface and mineral state holdings and an additional 24,001.03 acres of mineral only properties captured within the Grand Staircase - Escalante National Monument;
- 69,688.93 acres of surface and mineral property captured in Arches National Park, Capitol Reef National Park, Dinosaur National Monument, Glen Canyon National Recreation Area, and Flaming Gorge National Recreation Area;
- 45,241 acres of surface and mineral properties captured in the Navajo and Goshute Indian Reservation;
- 70,106.71 acres of surface and mineral property captured within Wasatch - Cache National Forest, Sawtooth National Forest, Ashley National Forest, Uintah National Forest, Manti-La Sal National Forest, Fishlake National Forest, Dixie National Forest, and Desert Range Experimental Station; and,
- Four tracts in the Alton Coal Field tracts previously designated unsuitable for mining (these lands are already accounted for in the Grand Staircase - Escalante National Monument acreage totals) for a total of 366,095 acres of land plus an additional mineral rights covering 66,479.27 acres.

The state of Utah on behalf of trust lands administration will receive:

- $50 million in cash;
- 13 million (1998 dollars) payable out of the Federal share of royalties from future coal sales at the Cottonwood Coal tract;
- 597.76 acres (surface and minerals) at the Blue Mountain telecommunications site in Uintah County;
- 2,998.63 acres (surface and minerals) in and around the Beaver Mountain Ski Resort;
- 1,920.00 acres (surface and minerals) at the Warner Valley tract, acquired primarily for surface development;
- 34,248.30 acres (surface and minerals) at the Big Water tract, acquired primarily for surface development;
- 12,797.50 acres (surface and minerals) at the Hatch tract, acquired primarily for surface development;
- 58,608.65 acres (surface and minerals) at the Ferron tract, containing an estimated 2 billion tons of in-place coal resource and 185 billion cubic of recoverable coalbed methane gas;

- 881.01 acres (surface and minerals) at the West Ridge tract, containing an estimated 4 million tons of recoverable coal;
- 2,228.96 acres (surface and minerals) at the Millard County tract, containing valuable limestone resources;
- 4,004.30 acres (surface and minerals) at the Duchesne County tract, containing speculative oil and gas potential;
- 2,600.76 acres (surface and minerals) at the Uintah County No. 1 and No. 2 tracts, containing speculative tar sands deposits;
- 5,562.82 acres (mineral only) at the Mill Fork tract, this property will revert to federal control after 22.3 million tons of coal are produced and sold from the tract;
- 9,597.02 acres (mineral only) at the North Horn tract, this property will revert to federal control after 100 million tons of coal are produced and sold from the tract;
- 5,113.84 acres (mineral only) at the Muddy and Dugout Canyon tracts, these properties will revert to federal control after 34 million tons of coal are produced and sold from the tracts.

Grand Total: $63 million, 120,885.87 acres of developable surface and mineral lands in addition to 20,273.68 acres of known mineral only properties.

In addition to the surface real estate development potential of the acquired lands, the properties are estimated to contain in excess of 185 billion cubic feet of recoverable coalbed methane, 160 million tons of recoverable coal, in-place coal resources in excess of 2 billion tons, valuable limestone resources and other speculative mineral assets.

This bill was sponsored by Utah Representative James Hansen and introduced into the House on May 12, 1998. Two of the five cosponsors were also Utah Representatives Merrill Cook and Christopher Cannon. The bill passed the house by voice vote on June 24, 1998 and was sent to the Senate. This bill was referred to the Committee on Energy and Natural Resources on June 25, 1998 and to the Subcommittee on Forests and Public Lands on June 26, 1998.

The bill has now passed the committee and is awaiting the reconvening of the full Senate in September for further action.

- Kaiser Steel Corp. as early as 1986 had plans to build a qualifying facility to utilize its coal refuse pile as was detailed in 1980 Federal Energy Regulatory Commission (FERC) order pursuant to Section 201 of Public Utility Regulatory Policies Act (PURPA) which actively encourages small power production in the country. When in 1988 Kaiser Steel Corp. and its subsidiary Kaiser Coal Company filed for bankruptcy, Sunnyside Salvage and Reclamation Company of Boulder, Colorado was formed to acquire the Sunnyside property of Kaiser Coal Company, which it did in 1989.

Sunnyside Coal Company operated successfully until February 1994 when its coal supply contract with Geneva Steel ran out and was not renewed.

Among the assets that Sunnyside Coal acquired from Kaiser was a 10 million tons plus coal refuse pile that had been accumulated for more than half a century. This refuse pile was both an asset and a liability. It is difficult to determine whether the coal pile had a positive or negative value. If nothing was going to be done with it Sunnyside Coal Company had to remove it to meet federal reclamation regulation when it was going to stop operation. This dilemma was to some extent alleviated when Environmental Power Corp. (EPC) of Delaware formed a Utah subsidiary by the name of Sunnyside Power Corp. to take over Kaiser's plans for qualifying facilities and Sunnyside Coal Company's refuse pile to build a facility that would generate electricity. The land that the coal refuse pile was sitting on was purchased for $1.2 million.

After four years of planning, preparation, negotiation,

capitalization and construction, Sunnyside Power Company started generation of electricity in 1993. This plant now utilizes between 300,000 to 350,000 tons of material from the refuse pile which was accumulated on the fee land and was subsequently conveyed by Kaiser Coal Company to Sunnyside Reclamation and Salvage Company and later the land that it sits on was sold to Sunnyside Power Co.

The consumption of the refuse pile to generate electricity by an independent company as part of the Public Utilities Regulatory Policies Act of 1978 (PURPA), which created a regulatory framework for encouraging electricity generation by renewable energy producers and cogenerators was not considered by this office at the time as a coal operation for the following reasons:

1) It was difficult to determine when the original coal was mined and from what leases. The majority of leases which were used in mining were privately held, some were federal leases and part of these leases bordered state leases. Therefore, it was very difficult, if not impossible to determine with any degree of accuracy from which lease the coal that was being used had come from.

2) The coal was stored on the private land and not the federal land.

3) The refuse pile was not directly sold as fuel to be used for a specific purpose.

4) The refuse pile was owned by Sunnyside Power Company and was consumed without changing hands to determine the price per ton of the fuel which was consumed.

5) When the land which the refuse pile sits on was purchased by Sunnyside Power Company it was not clear how much of the actual money that changed hands was for the land, how much for the refuse pile which was to be used as a fuel, or how much was for the rent of the land which was used to store the refuse pile upon, etc. making it extremely difficult to put a price on the present value of the refuse pile as a fuel source.

6) The ownership of the refuse pile had changed hands. If there were any royalty to be collected it should have taken place when the land and the pile were sold by the original owner. Now that the power plant is burning the refuse pile which it has already obtained and owns, it is difficult to collect royalty.

7) Finally, the amount of money that changed hands for the price of the land ($1.2 million) if it were for the value of the refuse pile it would make it about 11¢ per ton which makes the royalty value for the refuse pile less than one cent per ton, something that may not be economical to assert, assess, monitor and collect royalty on.

Appendix

Table 1 **Historical Production, Distribution, and Consumption of Coal in Utah**

Thousand Short Tons

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
1 PRODUCTION	14,269	16,521	18,164	20,517	22,012	21,875	21,015	21,723	24,422	25,051	27,071	**26,428**	28,425
2 DISTRIBUTION	13,243	16,989	18,244	20,289	21,680	21,673	21,339	21,935	23,441	25,443	27,816	**25,407**	29,467
3 E U OUTSID UTAH	2,989	3,182	2,797	2,623	3,373	3,608	4,000	3,914	4,841	6,570	7,258	**5,639**	7,883
4 E U IN UTAH	7,614	11,677	12,533	12,963	14,053	13,472	13,136	13,343	13,839	12,550	12,728	**14,780**	15,286
6 C P IN UTAH	868	291	1,259	1,277	1,296	1,310	1,182	1,089	1,198	1,062	1,120	**1,106**	1,110
7 IND OUTSIDE UTAH	1,745	1,813	1,996	2,401	2,327	2,158	2,006	2,146	2,322	2,399	2,339	**2,164**	2,535
8 IND IN UTAH	374	349	739	810	619	624	497	614	647	642	517	**665**	741
9 R/C OUTSIDE UTAH	81	83	88	84	59	76	81	134	308	68	51	**60**	61
10 R/C IN UTAH	191	204	236	323	382	320	347	228	157	182	260	**96**	128
11 OVERSEAS EXPORTS	551	555	1,044	2,175	1,708	2,112	2,245	2,567	2,717	3,811	5,468	**3,513**	4,566
12 TOTAL IMPORTS	1,145	1,165	2,448	2,367	2,137	2,007	2,155	2,100	2,588	1,841	1,925	**2,615**	2,843
13 IMPORTS E U	659	905	1,300	1,400	1,449	1,310	1,517	1,501	1,495	779	805	**1,509**	1,733
14 IMPORTS C P	383	160	1,088	922	679	695	629	579	1,089	1,062	1,120	**1,106**	1,110
15 IMPORTS IND	103	100	60	45	7	2	9	20	4	0	0	**0**	0
16 IMPORTS R/C	0	0	0	0	2	0	0	0	0	0	0	**0**	0
17 COAL OPERATORS	16	16	15	14	13	12	12	11	10	9	9	**9**	9
18 ACTIVE MINES	21	20	21	20	18	16	16	15	14	12	12	**13**	13
19 EMPLOYEES	2,881	2,650	2,559	2,471	2,791	2,292	2,106	2,161	2,024	1,989	2,077	**2,091**	2,186
20 PRODUCTIVITY,T/MH	3.08	3.25	3.69	4.42	4.10	4.79	5.13	5.47	6.01	6.41	5.91	**5.57**	6.22
21 AVERAGE PRICE $/TON	27.64	25.67	22.85	22.01	21.78	21.56	21.83	21.17	20.07	19.11	18.50	**18.34**	18.51
22 TOTAL VALUE $MM	394.0	417.0	415.0	451.0	479.4	471.6	458.8	459.9	490.2	478.7	500.8	**484.7**	526.1

Values for 1998 are forecast.

All distributions include imports. EU=Electric Utilities, CP=Coke plants, IND = Industrial, R/C=Residential and Commercial

Table 2 **Net Coal Production in Utah by Coal Mine, 1997**

Thousand Short Tons

Company	Mine	County	Coal Field	Production
Energy West	Deer Creek	Emery	Wasatch Plateau	4,480
	Trail Mountain	Emery	Wasatch Plateau	3,712
Canyon Fuel	Skyline #1 and #3	Emery/Carbon	Wasatch Plateau	4,315
	Soldier Canyon	Carbon	Book Cliffs	1,150
	Sufco	Sevier	Wasatch Plateau	4,939
White Oak	White Oak #2	Carbon	Wasatch Plateau	886
	Horizon	Carbon	Wasatch Plateau	0
Andalex Resources	Aberdeen	Carbon	Book Cliffs	1,872
Genwal	Crandall Canyon	Emery	Wasatch Plateau	2,662
Co-op	Bear Canyon	Emery	Wasatch Plateau	570
Cyprus Plateau	Star Point #2	Emery/Carbon	Wasatch Plateau	1,352
	Willow Creek	Carbon	Book Cliffs	447
Coval	Coval	Carbon	Book Cliffs	43
Total				**26,428**

Table 3 **Coal Production in Utah by Coal Field, 1982-1997**

Thousand Short Tons

Year	Wasatch Plateau	Book Cliffs	Emery	Sego	Coalville	Others	Total
1870-1981	166,404	234,547	5,723	2,654	4,262	2,332	415,922
1982	12,342	3,718	852	0	0	0	16,912
1983	10,173	1,568	88	0	0	0	11,829
1984	10,266	1,993	0	0	0	0	12,259
1985	9,386	2,805	640	0	0	0	12,831
1986	10,906	2,860	503	0	0	0	14,269
1987	13,871	2,348	269	0	33	0	16,521
1988	15,218	2,363	548	0	35	0	18,164
1989	17,146	2,785	586	0	0	0	20,517
1990	18,591	3,085	336	0	0	0	22,012
1991	18,934	2,941	0	0	0	0	21,875
1992	18,631	2,384	0	0	0	0	21,015
1993	19,399	2,324	0	0	0	0	21,723
1994	22,079	2,343	0	0	0	0	24,422
1995	22,631	2,420	0	0	0	0	25,051
1996	23,616	3,455	0	0	0	0	27,071
1997	22,916	3,512	0	0	0	0	26,428
1998	23,905	4,520	0	0	0	0	28,425
Cumulative Production	432,509	277,451	9,545	2,654	4,330	2,332	728,821

Values for 1998 are forecast and are not included in the total

Table 5 **Coal Production in Utah by Landownership**

Thousand Short Tons

Year	Federal Land		State Land		County Land		Fee Land		Total
	Production	Percent	Production	Percent	Production	Percent	Production	Percent	
1980	8,663	65.5%	1,105	8.3%	0	0.0%	3,468	26.2%	13,236
1981	8,719	63.1%	929	6.7%	0	0.0%	4,160	30.1%	13,808
1982	10,925	64.6%	998	5.9%	0	0.0%	4,989	29.5%	16,912
1983	6,725	56.9%	419	3.5%	0	0.0%	4,685	39.6%	11,829
1984	8,096	66.0%	285	2.3%	0	0.0%	3,878	31.6%	12,259
1985	9,178	71.5%	510	4.0%	0	0.0%	3,143	24.5%	12,831
1986	11,075	77.6%	502	3.5%	0	0.0%	2,692	18.9%	14,269
1987	13,343	80.8%	488	3.0%	0	0.0%	2,690	16.3%	16,521
1988	15,887	87.5%	263	1.4%	0	0.0%	2,014	11.1%	18,164
1989	16,931	82.5%	375	1.8%	153	0.7%	3,058	14.9%	20,517
1990	17,136	77.8%	794	3.6%	606	2.8%	3,476	15.8%	22,012
1991	18,425	84.2%	942	4.3%	144	0.7%	2,364	10.8%	21,875
1992	17,760	84.5%	1,384	6.6%	136	0.6%	1,735	8.3%	21,015
1993	19,099	87.9%	1,682	7.7%	116	0.5%	826	3.8%	21,723
1994	22,537	92.3%	1,227	5.0%	243	1.0%	415	1.7%	24,422
1995	23,730	94.7%	571	2.3%	289	1.2%	461	1.8%	25,051
1996	25,996	96.0%	446	1.6%	15	0.1%	614	2.3%	27,071
1997	25,161	95.2%	339	1.3%	0	0.0%	928	3.5%	26,428
1998	26,975	94.9%	597	2.1%	313	1.1%	540	1.9%	28,425

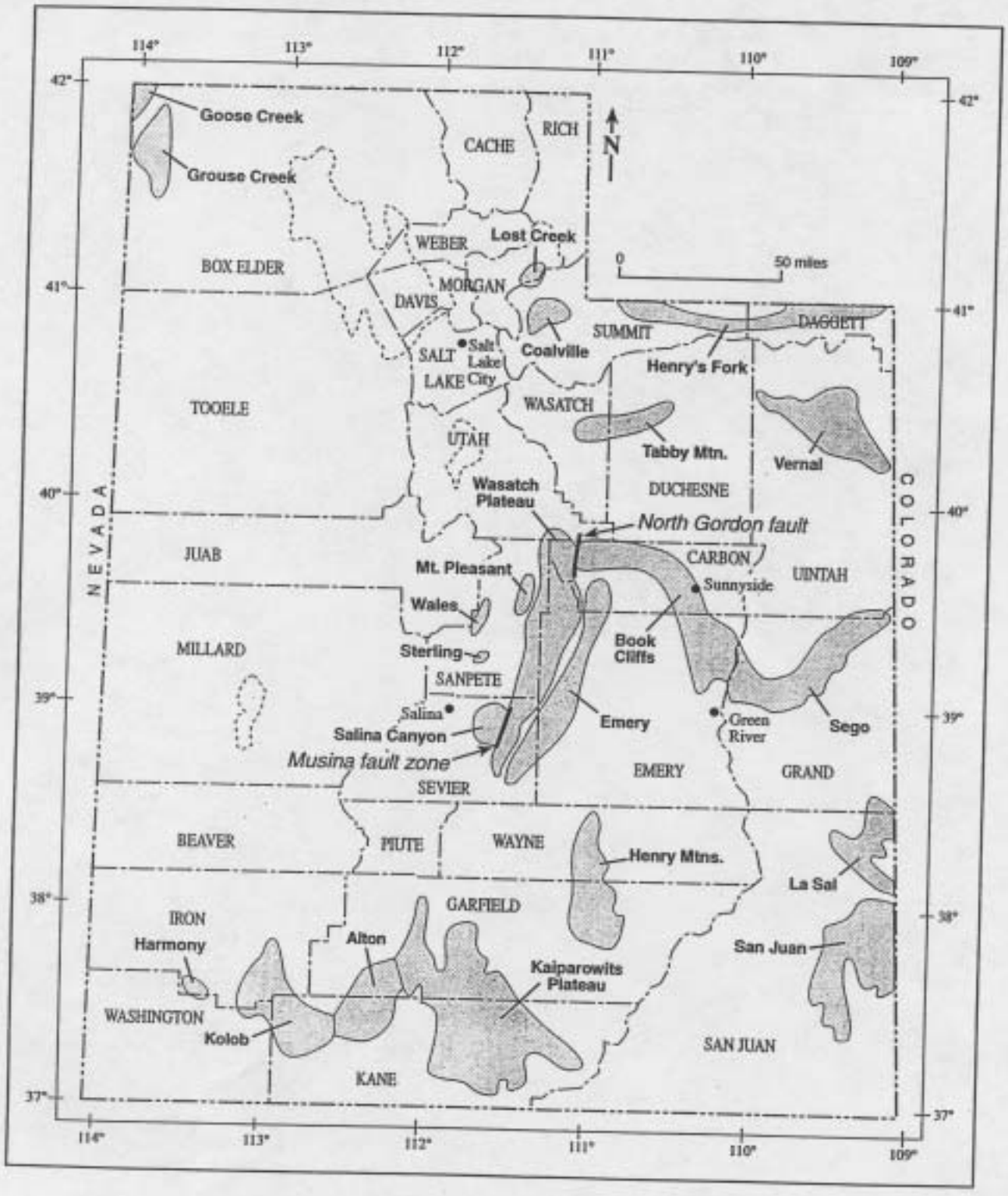
Values for 1998 are forecast.

Table 6 **Distribution of Utah Coal 1997**

By Destination and End-Use, thousand Short Tons

Destination	Electric Utilities	Other Industrial	Residential & Commercial	Total
California	819	1,669	0	2,488
Colorado	0	0	2	2
Hawaii	0	21	0	21
Idaho	0	22	22	44
Illinois	647	0	0	647
Missouri		120		120
Nevada	2,376	177	1	2,554
Oregon	0	6	0	6
Pennsylvania	226	0	0	226
Tennessee	1,498	0	0	1,498
Utah	**13,271**	**665**	**96**	**14,032**
Washington	0	70	35	105
Wisconsin	72	0	0	72
Pacific Rim	3,513	0	0	3,513
Total	**22,422**	2,829	156	25,407

Map 1 **Coal Fields of Utah**



Map 2 **Coal Mines and Load Outs of Wasatch Plateau and Book Cliffs Coal Fields**