

OPEN FILE REPORT 85-5

The METAL INDUSTRY IN COLORADO:
FORECASTS TO THE YEAR 2002



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February 10, 1985

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EXECUTIVE SUMMARY

This project was prepared through a grant from the Department of Local Affairs. The objective of this report is to forecast metal mining activity in Colorado to the year 2002. Forecasts are presented for seven metals including gold, silver, lead, zinc, copper, molybdenum, and uranium. Using production as the basis, projections of employment, wages and the amount of local purchases are also included.

Trend analysis is used as the forecasting method. It consists of fitting a curve to the historical data and then using the curve to forecast future values. This method provides reasonable projections based on project goals, time, and funding constraints.

The data for the project came from many sources as noted in Appendix C. The Colorado Division of Mines and the U.S. Bureau of Mines were the primary sources. Uranium data are derived from available DOE information. However, data from 1980 is not available, and will likely not be available in the future. Hence uranium was dropped from the metals that were forecasted.

Trend analysis was applied to total metal production at the county level, but gave poor results. Therefore, aggregate state level forecasts were prepared and then proportioned to each producing county. The resultant state forecasts and graph are shown in Appendix B. After curve fitting to a power five, a linear trend was chosen for the forecast. The trend of real dollars uses the slope of the linear trend calculated on the deflated dollars and the 1983 preliminary estimate from the USBM. This removes the effect of inflation on the value of metals over the period 1977 to 1981. Employment is projected using a constant rate that reflects productivity in Colorado over the last five years. Wages paid are calculated from the Mining Wage Index projected at a constant 5 percent growth rate. This wage rate is multiplied times the employment. The local purchases are a percent of production value. The percentage that is developed comes from a mine model that was developed on the two molybdenum mines in the state. This reflects the fact that 90 percent of the total state metal value is produced by the two mines.

Forecasts are usually incorrect and a method of using actual data as it becomes available each year to correct the forecast is always needed. A method is included to modify the forecast as data becomes available to measure the error. There are two points where errors are foreseeable. The forecast of the state total will be one source of errors and the ratios used to divide the total to the county level will be the other. The errors can be adjusted by changing the equation of the curve, and the ratios.

PURPOSE

This project is one of a series funded by the Department of Local Affairs. Their purpose is to forecast economic and demographic impacts of resource development at the county level in Colorado. This specific report forecasts metal production to the year 2002 for seven (7) metals. These metals are gold(au), silver(ag), copper(cu), lead(pb), molybdenum(mo) and zinc(zn). Because of the lack of data after 1980, it was decided to exclude uranium from the metals being forecasted. In addition to the production of these metals, there are three other related items that are forecasted. They are employment, wages paid, and local purchases by the companies producing the metals. These related items are projected using the metal forecasts as a basis for forecasting. The methodologies and the associated strengths and weaknesses are also discussed.

Originally the individual metals were to be forecasted on a county by county basis. After some work with the data it became apparent that using an aggregate method was the way the counties could be forecasted with better results. In carrying out the forecast, several assumptions are made about metal production in Colorado. These are noted in the Forecast Section.

ACKNOWLEDGEMENTS

I want to thank Al Hornbaker for his guidance and help during the writing of this report, Pat Rogers for his timely and useful suggestions. Bill Crowl made the paper more useful by suggestions during the draft stage of the report. Also, I want to thank Debra Tully for her comments about the forecasting tools used in the report.

Mr. Steve Colby of Department of Local Affairs contributed advice and suggestions during the course of the research. Mr. Ron Cattany of Department of Natural Resources edited the report and also contributed numerous suggestions.

REVIEW OF FORECAST OPTIONS

Several forecast methods were evaluated for this project. They were:

Quantitative

- econometric modelling
- input-output analysis
- resource analysis and modelling
- regression analysis
- time series analysis
- trend analysis

Qualitative

- delphi method
- technological forecasting

Econometric modelling and Input-Output analysis are ruled out because of the time and funds required by these complex methods. Resource analysis would have taken too much time and would have been one or two people's calculation of available resources. Also, it is a variant of the delphi method and should be carried out by a team. Regression is rated highly. Time series is concerned with the annual changes in the data due to the fluctuation of seasons parameters. Trend analysis, a variant of time-series analysis is recommended for a project of this type.

Trend analysis combines Time Series and Regression. It fits the data to a line by regression assuming that the independent variable is time. If long range (2 years +) accuracy is the primary need, the delphi method would have been recommended. Trend analysis was chosen because it is good for forecasting from short to medium term with historical data. It also can be carried out quickly and takes little resources in terms of time and money. It uses regression techniques to fit to the historical data. The disadvantage is that the method is poor for long term forecasts because it is not able to predict "turning points". These are points where a new idea or technology changes the way the trends are produced.

The 'delphi method' can be considered as an option; however, it is not a method that gives good numbers for short range forecasts. The delphi method on the other hand, is a very good technique for long range forecasts. It is a qualitative method that uses teams of experts to come to a consensus of the future for some subject. The resources required for the delphi method are 3-6 months time, and a panel of experts.

SUMMARY OF HISTORICAL DATA

The data used for the forecast came from several sources. All sources are noted in Appendix C. The Colorado Division of Mines (CDM) has 95 percent of the data up to 1980. The 1981 and 1982 data are provided by the U.S. Bureau of Mines (USBM). The state totals from USBM are divided to the counties using the percent county ratio to total for the years 1976-80. At the time of the project, a preliminary estimate for 1985 became available from the USBM. Uranium data is not easily available. Some is listed in the C.D.M. data, and the remainder is obtained from historical information provided by W. Chenoweth. Unfortunately, the uranium data collection activity has been transferred from the DOE office in Grand Junction to Washington D.C.; therefore, it appears that data will not be available in the future. For some years, data on some or all metals in one or more counties has not been available and had to be estimated.

For most of the forecasting methods, historical data is needed. To carry out this project, we have collected historical data on the following items for the period of 1955 to 1982 (since no production data for 1983 was available):

1. Production data on a county by county basis for individual metals;
2. Mining employment data for each county on a mine by mine basis;
3. Metal prices;
4. Producer price index;
5. GNP deflator;
6. Mine and plant wage index; and
7. Miscellaneous indexes associated with the mining industry

There are several sources of production data for the state including the Colorado Division of Mines, the U.S. Bureau of Mines and the Department of Energy. There are two sources of employment data for mining in the state including the U.S. Mine Safety and Health Administration (MSHA) and the Colorado Division of Employment and Training. Metal prices are gathered from mining trade journals at the U.S. Bureau of Mines library at the Federal Center in Lakewood. Cost deflators are collected from copies of "Survey of Current Business" published by the Department of Commerce. For mining wages and the associated indexes of the mining industry, the quickest source is The Minerals Availability Field.

FORECAST

Assumptions

As noted earlier, trend analysis was the method chosen to carry out the forecast. Several assumptions are accepted by choosing this method of forecasting:

1. Metal value produced is related to general business cycles of the economy, it is a variable dependent on time.
2. The aggregate value of all metals is a better forecasting variable than the individual metal values.
3. Colorado's market share for the metals does not change over time.
4. There is no substitution for the metals over the forecast period.
5. There is no depletion of the metal resources in a county over the period of the forecast.

Trend analysis fits the data to a curve by minimizing the mean square error by using the least squares method. The problem is to find and use a curve that most closely approximates the data. Any curve can be used from linear to quadratic to a polynomial of some power to a sine wave function. Forecasts were carried out from linear to a fifth power polynomial equation. The linear trend forecast was chosen for this report because the data it produced was the only one that reflected reality. Statistical tests were not used in this decision (In spite of the absence of a complete body of statistical theory for forecasting in time series, the venture can still be made). Application of forecasting methods will depend upon careful formulation and the judgement of experts. (Chou page 534). This forecast was carried out using linear trends. First, the data were smoothed using a three year moving average. A trend line was fitted to the smoothed data. The trend line is the forecast for the years 1984 to 2003.

Results

The graphs of the forecast and tables of forecast vlaues are in Appendix B.

Equations.

The general form of the forecast equations used in the process is:

$$Y = A + BX$$

Y is the metal value in \$000's

A is the line intercept

B is the slope fo the line

The equation for the forecast line is $Y = 23797 + 14318 X$

Other variables forecasted

a. Employment

Employment data is available for individual mines in the state for the last six years for MHSa on a county by county basis. The county totals are summed to the state level. This data is used to establish a value for the number of man-years per \$000's produced. Appendix A contains a table showing the employment figures for the state for the six years that are available from 1978-1983. These employment numbers are divided by the value produced each year. The numbers which range from 0.010 to 0.014 averaged to 0.012 over the five years. This value is considered a productivity ratio for the state. That is, it took 0.012 man-years to produce \$1000 of metal value in the state. This number is considered a stable amount unless there is some technological or social change that makes mining manpower more or less productive. The ratio is multiplied times the projected value each year to arrive at a total number employed for the entire state.

b. Wages

Wages are forecasted using the mining wage index. The index is inflated at a five percent rate from 1983 to 2002. That hourly amount is multiplied by 2080 hours to arrive at a yearly figure and then multiplied times the employment amount to arrive at a total yearly wage paid.

c. Local purchases

This variable is forecasted as a percentage of the production amount. the percent is developed from a mine model. The model is built using the 'Cost Estimation Handbook' by Clement and published by the USBM. The model developed is for a large underground mine. This is used since 90 percent of the total value in Colorado is produced by the two molybdenum mines. The amount will vary with the size and type of mine but it is felt that, on the average, it would be suitable. The total production amount was multiplied by 12 percent and this gives the amount of local purchases for each year.

d. Production

Future production projections are based on the linear trend, projection of historical production. As such it is subject to the shortcomings discussed in the following pages.

FUTURE MODIFICATION USING FORECASTING ERRORS

There are some basic tenets of forecasting. They are:

1. Forecasts are very rarely correct;
2. Forecasts are more accurate for families of items; and
3. Forecasts are less accurate the farther they are extended into the future.

It is understood that the forecast will have errors in it. This is especially true of long range forecasts. The errors in this forecast will be caused by four conditions:

1. Technological changes;
2. Short-term depletion of a resource in a county or area;
3. Change in the economy; and
4. New mines discovered and brought into operation.

Any of these four conditions will cause a basic structural change between the data and the fitted trend line. These changes are called "turning points". They are points where the time series can no longer be forecasted by previous historical data. Quantitative forecasting methods such as the method used here can not predict these turning points. Hence, a method must be used to utilize the errors in the forecast after the turning point occurs and is recognized. Also, the modification method must be able to adjust for errors in the basic equation.

Modifications of forecast using errors

As stated above, errors will occur and must be used to modify the forecast for future years. One method that will show if errors are occurring is to plot the value

$$(\text{actual/forecast}) \times 100 \text{ versus time}$$

This plot is shown in Figure 1. As shown any cluster of points that consistently fall above or below the 100 percent line indicates that the forecast contains an error. Any difference in the projected and the actual value is an error but errors must occur consistently on the plus or minus side of the actual for the projection to be in error. Therefore, deviations from the actual values can be expected. It takes more than one value to judge if the projection has a consistent error.

PLOTTING FORECASTING ERRORS

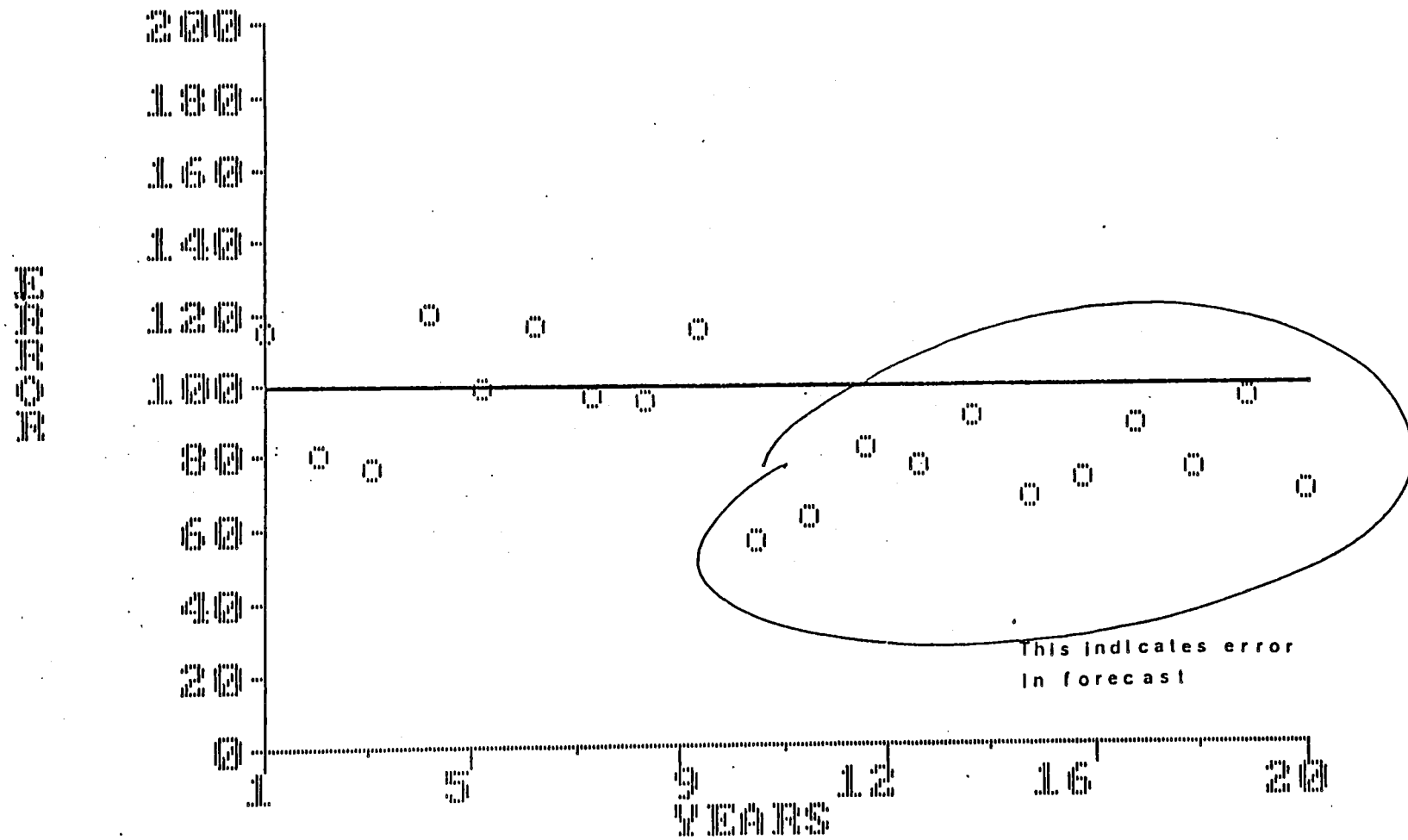


FIGURE 1

Modification of Production Forecast

The errors in the production forecast will occur because of:

Errors in the total forecast for the state, and
Errors in the ratios used to decompose the state total.

The line used for the forecast is:

$Y = a + bX$ a is the Y intercept of the line when $x=0$
 b is the slope of the line

In this case,

$Y = 23797 + 14318 X$ is the forecast equation for production.

Modification of State forecast errors

The slope of the equation may need revising after several actual values have been obtained. This refers to the earlier statement of plotting the % error (+ or -) over time. The slope is the amount of increase of the production over the past year.

This refers to the earlier statement of plotting the percentage error (+ or -) over time. The slope is the amount of increase of the production over the past year.

Modification of County ratios errors

Errors in the county ratios are more difficult to deal with. The ratios are developed from the Colorado Division of Mines which no longer provides such interpretation and from confidential USBM data for the years 1976 to 1980. The publicly available data from the USBM is only available for the state as a whole, although there will be some county totals available, but not all. If any county has a new mine startup or a significant size change, a modification in the county ratio will be necessary. The size of the mine and the commodity would tell the analyst how much of a change to make in the county ratio. Sometimes trade journal, press releases, and company annual reports will tell how much the mine is producing either in total dollar value or quantity of metal. Also, a drastic change in one or more metal prices will be an indication that a county ratio may need change. This is especially true when only one price change and a county relies on that metal for production value.

Modification of Employment Forecast

Projected employment is dependent upon the production value. The employment forecast uses a constant number that reflects the employment in mining over the last five years. Employment is not included for the counties that produced uranium. To determine if the number is changing, the USBM total value for the year should be divided into the MSHA employment value for the year. The resulting ratio should be compared to the value used for the projection -- 0.012. If there is a substantial change, the forecast can be recomputed by multiplying the new ratio times the projected metal values.

Modification of Wage Forecast

The wage forecast is dependent upon the employment forecast. The projected 1983 wage index is multiplied by the employment to arrive at total wages paid. If the growth of wages is different from the five percent rate, the index should be recomputed. Also, the wages will have to be recomputed using the new estimate of mining wage growth.

Modification of Local Purchase Forecast

Local purchase projections are based on the production value. This estimate is more difficult to measure and validate. The value of 12 percent is chosen based on a model Colorado. From the 'Cost Estimation Handbook by Clement et al' published by the U.S. Bureau of Mines for a mine in Colorado. The model is developed to reflect that 90 percent of the value produced in Colorado is mined at two mines that are underground with an open pit associated with one of the mines. If this basic relationship changes, a new model will have to be developed.

CONCLUSION

Trend analysis is used to fit a linear line to metal production in Colorado. This produced a forecast which can be used to study the impact the mineral industry will have in Colorado in the future. The strengths of this forecast are its simplicity and the ease of modification as new data becomes available. It can easily be recomputed using a hand-held calculator or a personal computer with a spreadsheet application.

The forecast's weakness is its inability to forecast "turning points" which may significantly increase or decrease metal production in the state. Also, uranium, which was important to production values in the past, is not included.

A turning point has been reached for the mining industry in the past three years. Because of this, this forecast is an upper limit to value of metal produced in Colorado. The next two years will provide data that can be used to recompute the slope of the production line to bring it more into alignment with the new trend.

The two molybdenum mines in the state account for more than 80% of the metal value produced. This ties the value produced directly to molybdenum. I suggest using commercially available molybdenum forecasts to get a trend for the major portion of the metal produced in the state.

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APPENDIX A

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COUNTY CODE LIST FOR TABLES

<u>CODE</u>	<u>COUNTY NAME</u>
ADAM	ADAMS
BOLD	BOULDER
CHAF	CHAFFEE
CLCK	CLEAR CREEK
COLO	COLORADO
CONE	CONEJOS
CUST	CUSTER
DLRS	DOLORES
EAGL	EAGLE
GARF	GARFIELD
GILP	GILPIN
GUNN	GUNNISON
HIND	HINSDALE
JEFF	JEFFERSON
LAKE	LAKE
LAPL	LA PLATA
MESA	MESA
MINE	MINERAL
MOFF	MOFFAT
MONT	MONTROSE
MOTZ	MONTEZUMA
OURY	OURAY
PARK	PARK
PUEB	PUEBLO
RIBL	RIO BLANCO
SAGU	SAGUACHE
SANJ	SAN JUAN
SANM	SAN MIGUEL
SUMM	SUMMIT
TELL	TELLER

COUNTY AND COLORADO STATE TOTALS FOR COMBINED METAL PRODUCTION

YEARS	BOLD	CHAF	CLCK	CONE	CUST	DLRS	EAGL	GILP	GUNN	HIND	JEFF	LAKE	LAPL	MINE	MOTZ	OURY	PARK	SAGU	SANJ	SANM	SUMM	TELL	TOTAL
55	80	1	74	0	10	1433	9589	80	824	1	12	46643	17	718	0	603	6	27	277	5391	347	1708	67841
56	73	1	351	0	10	1562	8281	83	2764	0	12	45699	20	1044	0	711	8	28	282	9621	370	1866	72786
57	21	19	332	0	9	137	9172	20	1194	0	0	53960	28	890	0	625	31	38	222	9018	53	1650	77419
58	5	6	92	0	0	0	8667	4	0	0	0	30472	0	804	3	1821	211	270	140	5661	0	1530	49686
59	1	0	124	0	0	0	5616	2	0	0	0	45698	0	614	5	1854	145	117	0	5509	4	1176	60865
60	11	0	121	0	0	347	5541	1	125	7	0	62014	0	1165	0	2336	0	0	630	6741	1	1095	80135
61	0	0	13	0	0	299	7190	22	0	0	17	65000	1	1262	0	4079	0	0	50	6248	51	1183	85415
62	0	0	21	0	0	435	7566	17	0	0	17	46695	5	1510	0	2698	4	0	591	6336	5	0	65900
63	10	6	327	0	0	456	9057	2	892	2	3	66393	0	1181	8	2540	1	0	2235	7339	257	0	90709
64	0	18	183	0	15	420	9227	9	2516	0	2	72832	7	1602	7	2466	4	0	4016	7716	25	0	101065
65	0	0	0	0	35	645	8371	0	2806	0	0	78026	0	1573	0	2582	2	0	5138	7639	24	0	106841
66	0	0	16	25	35	1087	9255	1	3043	0	0	87212	0	1401	0	3268	1	0	5356	9424	0	0	120924
67	18	0	2134	18	0	963	7281	6	1281	55	0	94189	0	1520	0	3143	0	0	5012	9093	0	0	125513
68	7	0	13156	38	0	831	7100	2	0	5	0	83870	0	1544	0	3266	17	0	4757	8994	0	0	123587
69	4	0	12871	100	1	1101	5049	1	411	0	2	90054	0	3218	0	3038	17	0	6614	9181	0	0	131662
70	20	0	14007	75	3	1247	4888	0	117	0	2	100722	0	4788	0	3259	2	0	7061	8338	0	0	144529
71	8	0	12544	3	0	705	5120	10	14	0	0	95035	0	2800	0	3607	2	0	6681	8787	0	0	135316
72	4	0	12073	92	0	474	4423	12	0	0	0	95196	0	3184	0	6992	4	0	6918	9960	0	0	139332
73	2	0	9178	99	0	471	4626	1	0	0	0	94282	0	5100	0	5133	5	0	9531	10250	0	47	138725
74	2	0	8131	69	0	474	7444	11	297	0	23	125541	0	6396	5	8412	0	0	10500	16243	0	0	103556
75	73	0	8447	0	0	161	6320	23	241	0	0	154902	0	13785	0	9226	0	0	10478	14825	0	64	210545
76	1	0	8665	0	0	483	5499	50	0	165	0	186209	0	6609	0	9253	0	0	8764	13955	0	418	240071
77	156	0	87416	0	0	0	5409	4	0	16	0	203548	0	9035	0	4726	6	0	13644	11609	0	534	336103
78	304	0	145067	0	0	0	1206	0	0	0	0	247069	0	11334	0	2916	15	0	6800	8748	0	0	423459
79	534	0	281539	0	0	0	2822	18	0	0	0	345949	0	17382	0	0	270	0	2335	0	0	1250	652099
80	224	0	303788	0	0	0	4938	83	0	0	0	341095	0	25603	0	867	1500	0	19480	0	50	1365	690993
81	250	0	232055	0	0	0	3315	75	0	0	0	287530	0	15395	0	1480	975	0	24570	0	95	1655	567395
82	60	0	160335	0	0	0	0	110	0	0	0	214855	5	10755	0	5	570	0	25090	35	0	3240	415060

Metals included are Au, Ag, Pb, Cu, Mo, and Zn.

For county names, see County Code List.

HISTORICAL URANIUM PRODUCTION DATA \$000's

YEAR	GARF	JEFF	MESA	MOFF	MONT	RIBL	SANM	SAGU	TOTAL
62		1802			19558				21360
63					14191				14191
64					10771				10771
65	3445	0	3938	0	8090	48	7998	0	23519
66	3823	1195	4315	0	11678	95	5698	245	27049
67	3888	3051	5508	0	7551	42	4247	0	24287
68	2810	2306	4788	0	8860	43	3866	0	22673
69	2965	3472	2968	0	7932	6	3027	0	20370
70	3286	5315	2435	0	5828	0	2672	612	20148
71	193	2957	1682	0	4283	0	3114	14	12243
72	231	5511	627	0	1863	0	2842	26	11100
73	5	4444	394	0	703	0	1964	0	7510
74	263	5357	847	0	1769	0	3993	0	12229
75	236	3723	1211	0	3256	0	4138	0	12564
76	0	2243	1841	0	4587	10	4165	0	12846
77	0	2035	2187	1050	20200	117	7647	138	33374
78	0	2962	2433	869	14698	107	7619	174	28862
79	0	5565	3160	772	19014	130	11168	0	39809
80		5481	1336	303	13371	0	3722	2017	26230

*

For county names, see County Code List.

* Data unavailable after 1980

PERCENT OF INDIVIDUAL COUNTY PRODUCTION TO TOTAL COLORADO PRODUCTION

YEARS	BOLD	CHAF	CLCK	CONE	CUST	DLRS	EAGL	GILP	GUNN	HIND	JEFF	LAKE	LAPL	TOTAL
55	0.12	0.00	0.11	0.00	0.01	2.11	14.13	0.12	1.21	0.00	0.02	68.75	0.03	67841
56	0.10	0.00	0.48	0.00	0.01	2.15	11.38	0.11	3.80	0.00	0.02	62.79	0.03	72786
57	0.03	0.02	0.43	0.00	0.01	0.18	11.85	0.03	1.54	0.00	0.00	69.70	0.04	77419
58	0.01	0.01	0.19	0.00	0.00	0.00	17.44	0.01	0.00	0.00	0.00	61.33	0.00	49686
59	0.00	0.00	0.20	0.00	0.00	0.00	9.23	0.00	0.00	0.00	0.00	75.08	0.00	60065
60	0.01	0.00	0.15	0.00	0.00	0.43	6.91	0.00	0.16	0.01	0.00	77.39	0.00	80135
61	0.00	0.00	0.02	0.00	0.00	0.35	8.42	0.03	0.00	0.00	0.02	76.10	0.00	85415
62	0.00	0.00	0.03	0.00	0.00	0.66	11.48	0.03	0.00	0.00	0.03	70.86	0.01	65900
63	0.01	0.01	0.36	0.00	0.00	0.50	9.98	0.00	0.98	0.00	0.00	73.19	0.00	90709
64	0.00	0.02	0.18	0.00	0.01	0.42	9.13	0.01	2.49	0.00	0.00	72.06	0.01	101065
65	0.00	0.00	0.00	0.00	0.03	0.60	7.84	0.00	2.63	0.00	0.00	73.03	0.00	106841
66	0.00	0.00	0.01	0.02	0.03	0.90	7.66	0.00	3.18	0.00	0.00	72.18	0.00	120824
67	0.01	0.00	1.70	0.01	0.00	0.77	5.80	0.00	1.02	0.04	0.00	75.04	0.00	125513
68	0.01	0.00	10.65	0.03	0.00	0.67	5.74	0.00	0.00	0.00	0.00	67.86	0.00	123587
69	0.00	0.00	9.78	0.08	0.00	0.84	3.83	0.00	0.31	0.00	0.00	68.40	0.00	131662
70	0.01	0.00	9.69	0.05	0.00	0.86	3.38	0.00	0.08	0.00	0.00	69.69	0.00	144529
71	0.01	0.00	9.27	0.00	0.00	0.52	3.78	0.01	0.01	0.00	0.00	70.23	0.00	135316
72	0.00	0.00	8.66	0.07	0.00	0.34	3.17	0.01	0.00	0.00	0.00	68.32	0.00	139332
73	0.00	0.00	6.62	0.07	0.00	0.34	3.33	0.00	0.00	0.00	0.00	67.96	0.00	138725
74	0.00	0.00	4.43	0.04	0.00	0.26	4.06	0.01	0.16	0.00	0.01	68.39	0.00	103556
75	0.03	0.00	3.87	0.00	0.00	0.07	2.89	0.01	0.11	0.00	0.00	70.88	0.00	218545
76	0.00	0.00	3.61	0.00	0.00	0.20	2.29	0.02	0.00	0.07	0.00	77.56	0.00	240071
77	0.05	0.00	26.01	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00	60.56	0.00	336103
78	0.07	0.00	34.26	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	58.35	0.00	423459
79	0.08	0.00	43.17	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	53.05	0.00	652099
80	0.03	0.00	43.46	0.00	0.00	0.00	0.71	0.01	0.00	0.00	0.00	48.00	0.00	690993
81	0.04	0.00	40.90	0.00	0.00	0.00	0.58	0.01	0.00	0.00	0.00	50.68	0.00	567395
82	0.01	0.00	38.56	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	51.67	0.00	415060

Metals included are Ag, Au, Cu, Mo, Pb, and Zn.

For county names, see County Code List.

PERCENT OF INDIVIDUAL COUNTY PRODUCTION TO TOTAL COLORADO PRODUCTION

YEARS	MINE	NOTZ	OURY	PARK	SAGU	SANJ	SANM	SUMM	TELL	TOTAL
55	1.06	0.00	0.89	0.01	0.04	0.41	7.95	0.51	2.52	67841
56	1.43	0.00	0.98	0.01	0.04	0.39	13.22	0.51	2.56	72786
57	1.15	0.00	0.81	0.04	0.05	0.29	11.65	0.07	2.13	77419
58	1.62	0.01	3.67	0.42	0.54	0.28	11.39	0.00	3.08	49686
59	1.01	0.01	3.05	0.24	0.19	0.00	9.05	0.01	1.93	60865
60	1.45	0.00	2.92	0.00	0.00	0.79	8.41	0.00	1.37	80135
61	1.48	0.00	4.78	0.00	0.00	0.06	7.31	0.06	1.39	85415
62	2.29	0.00	4.09	0.01	0.00	0.90	9.61	0.01	0.00	65900
63	1.30	0.01	2.80	0.00	0.00	2.46	8.09	0.28	0.00	90709
64	1.59	0.01	2.44	0.00	0.00	3.97	7.63	0.02	0.00	101065
65	1.47	0.00	2.42	0.00	0.00	4.81	7.15	0.02	0.00	106841
66	1.16	0.00	2.70	0.00	0.20	4.43	7.79	0.00	0.00	120924
67	1.21	0.00	2.50	0.00	0.00	4.63	7.24	0.00	0.00	125513
68	1.25	0.00	2.64	0.01	0.00	3.85	7.28	0.00	0.00	123587
69	2.44	0.00	2.31	0.01	0.00	4.19	6.97	0.00	0.00	131662
70	3.31	0.00	2.25	0.00	0.00	4.89	5.77	0.00	0.00	144529
71	2.07	0.00	2.67	0.00	0.00	4.94	6.49	0.00	0.00	135316
72	2.29	0.00	5.02	0.00	0.00	4.97	7.15	0.00	0.00	139332
73	3.68	0.00	3.70	0.00	0.00	6.87	7.39	0.00	0.03	138725
74	3.48	0.00	4.58	0.00	0.00	5.72	8.85	0.00	0.00	183556
75	6.31	0.00	4.22	0.00	0.00	4.79	6.78	0.00	0.03	218545
76	2.75	0.00	3.85	0.00	0.00	3.65	5.01	0.00	0.17	240071
77	2.69	0.00	1.41	0.00	0.00	4.06	3.45	0.00	0.16	336103
78	2.68	0.00	0.69	0.00	0.00	1.61	2.07	0.00	0.00	423459
79	2.67	0.00	0.00	0.04	0.00	0.36	0.00	0.00	0.19	652099
80	3.66	0.00	0.12	0.21	0.00	2.79	0.00	0.01	0.20	698993
81	2.71	0.00	0.26	0.17	0.00	4.33	0.00	0.02	0.29	567395
82	2.59	0.00	0.00	0.14	0.00	6.23	0.01	0.00	0.78	415860

Metals included are Ag, Au, Cu, Mo, Pb, and Zn.

For county names see county code list.

PROJECTED COUNTY METAL PRODUCTION \$000's

YEAR	TOTAL	BOLD 0.04	CLCK 32.85	DLRS 0.00	EAGL 0.00	GILP 0.01	HIND 0.01	LAKE 57.24	MINE 2.82	DURY 0.90	PARK 0.08	SANJ 3.29	SANM 1.62	SUMM 0.004	TELL 0.26
55	67841	80	74	1433	9589	80	1	46643	718	603	6	277	5391	347	1708
56	72786	73	351	1562	8281	83	0	45699	1044	711	8	282	9621	370	1866
57	77419	21	332	137	9172	20	0	53960	890	625	31	222	9018	53	1650
58	49686	5	92	0	8667	4	0	30472	804	1821	211	140	5661	0	1530
59	60865	1	124	0	5616	2	0	45698	614	1854	145	0	5509	4	1176
60	80135	11	121	347	5541	1	7	62014	1165	2336	0	630	6741	1	1095
61	85415	0	13	299	7190	22	0	65000	1262	4079	0	50	6248	51	1183
62	65900	0	21	435	7566	17	0	46695	1510	2698	4	591	6336	5	0
63	90709	10	327	456	9057	2	2	66393	1181	2540	1	2235	7339	257	0
64	101065	0	183	420	9227	9	0	72832	1602	2466	4	4016	7716	25	0
65	106841	0	0	645	8371	0	0	78026	1573	2582	2	5138	7639	24	0
66	120924	0	16	1087	9255	1	0	87212	1401	3268	1	5356	9424	0	0
67	125513	18	2134	963	7281	6	55	94189	1520	3143	0	5812	9093	0	0
68	123587	7	13156	831	7100	2	5	83870	1544	3266	17	4757	8994	0	0
69	131662	4	12871	1101	5049	1	0	90054	3218	3038	17	6614	9181	0	0
70	144529	20	14007	1247	4888	0	0	100722	4788	3259	2	7061	8338	0	0
71	135316	8	12544	705	5120	10	0	95035	2800	3607	2	6681	8787	0	0
72	139332	4	12073	474	4423	12	0	95196	3184	6992	4	6918	9960	0	0
73	138725	2	9178	471	4626	1	0	94282	5100	5133	5	9531	10250	0	47
74	103556	2	8131	474	7444	11	0	125541	6396	8412	0	10508	16243	0	0
75	218545	73	8447	161	6320	23	0	154902	13785	9226	0	10478	14825	0	64
76	240071	1	8665	483	5499	50	165	186209	6609	9253	0	8764	13955	0	418
77	336183	156	87416	0	5409	4	16	203548	9035	4726	6	13644	11609	0	534
78	423459	304	145067	0	1206	0	0	247069	11334	2916	15	6800	8748	0	0
79	652099	534	281539	0	2822	18	0	345949	17382	0	270	2335	0	0	1250
80	698993	224	303788	0	4938	83	0	341095	25603	867	1500	19480	0	50	1365
81	567395	250	232055	0	3315	75	0	287530	15395	1480	975	24570	0	95	1655
82	415860	60	160335	0	0	110	0	214055	10755	5	570	25890	35	0	3240
83	349821	140	114916	0	0	35	35	200238	9865	3148	280	11509	5667	14	910
84	354676	142	116511	0	0	35	35	203017	10002	3192	284	11669	5746	14	922
85	359530	144	118106	0	0	36	36	205795	10139	3236	288	11829	5824	14	935
86	364385	146	119700	0	0	36	36	208574	10276	3279	292	11988	5903	15	947
87	369239	148	121295	0	0	37	37	211352	10413	3323	295	12148	5982	15	960
88	374094	150	122890	0	0	37	37	214131	10549	3367	299	12308	6060	15	973
89	378948	152	124484	0	0	38	38	216910	10686	3411	303	12467	6139	15	985
90	383803	154	126079	0	0	38	38	219689	10823	3454	307	12627	6218	15	998
91	388657	155	127674	0	0	39	39	222467	10960	3498	311	12787	6296	16	1011
92	393512	157	129269	0	0	39	39	225246	11097	3542	315	12947	6375	16	1023
93	398366	159	130863	0	0	40	40	228025	11234	3585	319	13106	6454	16	1036
94	403221	161	132458	0	0	40	40	230804	11371	3629	323	13266	6532	16	1048
95	408075	163	134053	0	0	41	41	233582	11508	3673	326	13426	6611	16	1061
96	412930	165	135648	0	0	41	41	236361	11645	3716	330	13585	6689	17	1074
97	417784	167	137242	0	0	42	42	239140	11782	3760	334	13745	6768	17	1086
98	422639	169	138837	0	0	42	42	241919	11918	3804	338	13905	6847	17	1099
99	427493	171	140431	0	0	43	43	244697	12055	3847	342	14065	6925	17	1111
100	432348	173	142026	0	0	43	43	247476	12192	3891	346	14224	7004	17	1124
101	437202	175	143621	0	0	44	44	250254	12329	3935	350	14384	7083	17	1137
102	442057	177	145216	0	0	44	44	253033	12466	3979	354	14544	7161	18	1149

* Eagle Mine closed 1982. County ratio changed to 0

COLORADO STATE EMPLOYMENT - HISTORICAL DATA

SOURCE: MINE SAFETY AND HEALTH ADMINISTRATION

YEARS	BOLD	CHAF	CLCK	CONE	CUST	DLRS	EAGL	GILP	GUNN	HIND	JEFF	LAKE	LAPL
78	28	2	1582	0	0	8	52	5	26	0	177	3103	2
79	28	0	2002	0	0	26	37	7	126	0	224	3260	0
80	65	0	2182	20	0	39	35	31	121	15	210	3435	3
81	85	29	2071	44	3	41	51	127	139	29	196	3308	22
82	42	0	1141	23	3	82	43	63	16	15	198	1428	20
83	59	3	366	6	0	10	27	36	27	23	168	510	13

YEARS	DURY	PARK	SAGU	SANJ	SANM	SUMM	TELL	TOTAL	TOTAL \$000 PRODUCTION	MANYEARS PER PRODUCTION \$000
78	154	14	49	225	310	9	82	5981	423459	0.014
79	24	30	121	171	274	10	41	6557	652099	0.010
80	77	119	265	263	275	38	73	7586	698993	0.011
81	98	182	202	423	173	43	213	7770	567395	0.014
82	49	143	93	264	138	10	225	4159	415860	0.010
83	61	97	83	354	72	14	177	2216		

AVERAGE
78 TO 82 0.012

PROJECTED COUNTY MINING EMPLOYMENT

TOTAL	BOLD	CLCK	DLRS	EAGL	GILP	HIND	LAKE	MINE	OURY	PARK	SANJ	SANM	SUMM	TELL
YEAR EMPLOYED	@ 0.04	@ 32.85	@ 0.00	@ * 0.00	@ 0.01	@ 0.01	@ 57.24	@ 2.82	@ 0.90	@ 0.08	@ 3.29	@ 1.62	@ 0.004	@ 0.26
78	5981													
79	6587													
80	7586													
81	7770													
82	4159													
83	4198	2	1379	0	0	0	2403	118	38	3	138	68	0	11
84	4256	2	1398	0	0	0	2436	120	38	3	140	69	0	11
85	4314	2	1417	0	0	0	2469	122	39	3	142	70	0	11
86	4373	2	1437	0	0	0	2503	123	39	3	144	71	0	11
87	4431	2	1456	0	0	0	2536	125	40	4	146	72	0	12
88	4489	2	1475	0	0	0	2570	127	40	4	148	73	0	12
89	4547	2	1494	0	0	0	2603	128	41	4	150	74	0	12
90	4606	2	1513	0	0	0	2636	130	41	4	152	75	0	12
91	4664	2	1532	0	0	0	2670	132	42	4	153	76	0	12
92	4722	2	1551	0	0	0	2703	133	42	4	155	76	0	12
93	4780	2	1570	0	0	0	2736	135	43	4	157	77	0	12
94	4839	2	1590	0	0	0	2770	136	44	4	159	78	0	13
95	4897	2	1609	0	0	0	2803	138	44	4	161	79	0	13
96	4955	2	1628	0	0	0	2836	140	45	4	163	80	0	13
97	5013	2	1647	0	0	1	2869	141	45	4	165	81	0	13
98	5072	2	1666	0	0	1	2903	143	46	4	167	82	0	13
99	5130	2	1685	0	0	1	2936	145	46	4	169	83	0	13
100	5188	2	1704	0	0	1	2970	146	47	4	171	84	0	13
101	5246	2	1723	0	0	1	3003	148	47	4	173	85	0	14
102	5305	2	1743	0	0	1	3037	150	48	4	175	86	0	14

PROJECTED ANNUAL COUNTY WAGES FROM MINING

YEAR	TOTAL WAGES	BOLD @ 0.04	CLCK @ 32.85	DLRS @ 0.00	EAGL @ * 0.00	GILP @ 0.01	HIND @ 0.01	LAKE @ 57.24	MINE @ 2.82	OURY @ 0.90	PARK @ 0.08	SANJ @ 3.29	SANM @ 1.62	SUMM @ 0.004	TELL @ 0.26
83	98928	40	32498	0	0	10	10	56626	2790	890	79	3255	1603	4	257
84	105316	42	34596	0	0	11	11	60283	2970	948	84	3465	1706	4	274
85	112096	45	36824	0	0	11	11	64164	3161	1009	90	3688	1816	4	291
86	119290	48	39187	0	0	12	12	68282	3364	1074	95	3925	1932	5	310
87	126923	51	41694	0	0	13	13	72651	3579	1142	102	4176	2056	5	330
88	135021	54	44354	0	0	14	14	77286	3808	1215	108	4442	2187	5	351
89	143612	57	47177	0	0	14	14	82204	4050	1293	115	4725	2327	6	373
90	152724	61	50170	0	0	15	15	87419	4307	1375	122	5025	2474	6	397
91	162389	65	53345	0	0	16	16	92951	4579	1462	130	5343	2631	6	422
92	172638	69	56712	0	0	17	17	98818	4868	1554	138	5680	2797	7	449
93	183506	73	60282	0	0	18	18	105039	5175	1652	147	6037	2973	7	477
94	195029	78	64067	0	0	20	20	111635	5500	1755	156	6416	3159	8	507
95	207246	83	68080	0	0	21	21	118628	5844	1865	166	6818	3357	8	539
96	220197	88	72335	0	0	22	22	126041	6210	1982	176	7244	3567	9	573
97	233925	94	76844	0	0	23	23	133899	6597	2105	187	7696	3790	9	608
98	248475	99	81624	0	0	25	25	142227	7007	2236	199	8175	4025	10	646
99	263896	106	86690	0	0	26	26	151054	7442	2375	211	8682	4275	11	686
100	280237	112	92058	0	0	28	28	160408	7903	2522	224	9220	4540	11	729
101	297553	119	97746	0	0	30	30	170319	8391	2678	238	9789	4820	12	774
102	315900	126	103773	0	0	32	32	180821	8908	2843	253	10393	5118	13	821

* Eagle Mine closed 1982. County ratio changed to 0

PROJECTED LOCAL PURCHASES BY COUNTY AT 12% (\$000's)

YEAR	TOTAL	BOLD 0.04	CLCK 32.85	DLRS 0.00	EAGL 0.00	GILP 0.01	HIND 0.01	LAKE 57.24	MINE 2.82	OURY 0.90	PARK 0.08	SANJ 3.29	SANM 1.62	SUMM 0.004	TELL 0.26
55	8141	10	9	172	1151	10	0	5597	86	72	1	33	647	42	205
56	8734	9	42	187	994	10	0	5484	125	85	1	34	1155	44	224
57	9290	3	40	16	1101	2	0	6475	107	75	4	27	1082	6	198
58	5962	1	11	0	1040	0	0	3657	96	219	25	17	679	0	184
59	7304	0	15	0	674	0	0	5484	74	222	17	0	661	0	141
60	9616	1	15	42	665	0	1	7442	140	280	0	76	809	0	131
61	10250	0	2	36	863	3	0	7800	151	489	0	6	750	6	142
62	7908	0	3	52	908	2	0	5603	181	324	0	71	760	1	0
63	10885	1	39	55	1087	0	0	7967	142	305	0	268	881	31	0
64	12128	0	22	50	1107	1	0	8740	192	296	0	482	926	3	0
65	12821	0	0	77	1005	0	0	9363	189	310	0	617	917	3	0
66	14511	0	2	130	1111	0	0	10465	168	392	0	643	1131	0	0
67	15062	2	256	116	874	1	7	11303	182	377	0	697	1091	0	0
68	14830	1	1579	100	852	0	1	10064	185	392	2	571	1079	0	0
69	15799	0	1545	132	606	0	0	10806	386	365	2	794	1102	0	0
70	17343	2	1681	150	587	0	0	12087	575	391	0	847	1001	0	0
71	16238	1	1505	85	614	1	0	11404	336	433	0	802	1054	0	0
72	16720	0	1449	57	531	1	0	11424	382	839	0	830	1195	0	0
73	16647	0	1101	57	555	0	0	11314	612	616	1	1144	1230	0	6
74	22027	0	976	57	893	1	0	15065	768	1009	0	1261	1949	0	0
75	26225	9	1014	19	758	3	0	18588	1654	1107	0	1257	1779	0	8
76	28009	0	1040	58	660	6	20	22345	793	1110	0	1052	1675	0	50
77	40332	19	10490	0	649	0	2	24426	1084	567	1	1637	1393	0	64
78	50815	36	17408	0	145	0	0	29648	1360	350	2	816	1050	0	0
79	78252	64	33785	0	339	2	0	41514	2086	0	32	280	0	0	150
80	83879	27	36455	0	593	10	0	40931	3072	104	180	2338	0	6	164
81	68087	30	27847	0	398	9	0	34504	1847	178	117	2948	0	11	199
82	49903	7	19240	0	0	13	0	25783	1291	1	68	3107	4	0	389
83	41979	17	13790	0	0	4	4	24029	1184	378	34	1381	680	2	109
84	42561	17	13981	0	0	4	4	24362	1200	383	34	1400	689	2	111
85	43144	17	14173	0	0	4	4	24695	1217	388	35	1419	699	2	112
86	43726	17	14364	0	0	4	4	25029	1233	394	35	1439	708	2	114
87	44309	18	14555	0	0	4	4	25362	1250	399	35	1458	718	2	115
88	44891	18	14747	0	0	4	4	25696	1266	404	36	1477	727	2	117
89	45474	18	14938	0	0	5	5	26029	1282	409	36	1496	737	2	118
90	46056	18	15130	0	0	5	5	26363	1299	415	37	1515	746	2	120
91	46639	19	15321	0	0	5	5	26696	1315	420	37	1534	756	2	121
92	47221	19	15512	0	0	5	5	27030	1332	425	38	1554	765	2	123
93	47804	19	15704	0	0	5	5	27363	1348	430	38	1573	774	2	124
94	48387	19	15895	0	0	5	5	27696	1364	435	39	1592	784	2	126
95	48969	20	16086	0	0	5	5	28030	1381	441	39	1611	793	2	127
96	49552	20	16278	0	0	5	5	28363	1397	446	40	1630	803	2	129
97	50134	20	16469	0	0	5	5	28697	1414	451	40	1649	812	2	130
98	50717	20	16660	0	0	5	5	29030	1430	456	41	1669	822	2	132
99	51299	21	16852	0	0	5	5	29364	1447	462	41	1688	831	2	133
100	51882	21	17043	0	0	5	5	29697	1463	467	42	1707	840	2	135
101	52464	21	17235	0	0	5	5	30031	1479	472	42	1726	850	2	136
102	53047	21	17426	0	0	5	5	30364	1496	477	42	1745	859	2	138

* Eagle Mine closed 1982. County ratio changed to 0

METAL PRICES

YEAR	Au \$/Oz	Ag \$/Oz	Mo \$/lb	Pb \$/lb	Zn \$/lb	Cu \$/lb	U \$/lb
1965	35.00	1.29	1.55	0.16	0.15	0.35	US GOVT ONLY
1966	35.00	1.29	1.55	0.15	0.15	0.37	8.00
1967	35.00	1.55	1.62	0.14	0.14	0.39	8.00
1968	39.26	2.14	1.62	0.13	0.14	0.42	6.56
1969	41.51	1.79	1.72	0.15	0.15	0.48	6.16
1970	36.41	1.77	1.72	0.16	0.15	0.58	6.24
1971	41.52	1.55	1.72	0.14	0.16	0.52	6.48
1972	58.60	1.69	1.72	0.15	0.18	0.51	5.95
1973	97.81	2.56	1.72	0.16	0.21	0.60	7.10
1974	159.74	4.71	2.02	0.23	0.36	0.77	11.03
1975	161.49	4.42	2.48	0.22	0.39	0.64	23.68
1976	125.32	4.35	2.94	0.23	0.37	0.70	39.70
1977	148.31	4.62	3.68	0.30	0.34	0.67	42.20
1978	193.55	5.40	4.52	0.34	0.31	0.67	43.23
1979	307.50	11.09	7.60	0.53	0.37	0.93	42.57
1980	612.56	20.63	9.82	0.42	0.37	1.02	31.79
1981	459.64	10.52	4.30	0.37	0.45	0.85	24.19
1982	375.91	7.95	3.95	0.26	0.35	0.74	19.90
JAN 83	445.43	10.59	2.50	0.22	0.39	0.78	20.25
JUN 83	437.56	12.98	3.60	0.19	0.40	0.79	23.50
JAN 84	394.00	9.54	3.40	0.26	0.51	0.71	20.50

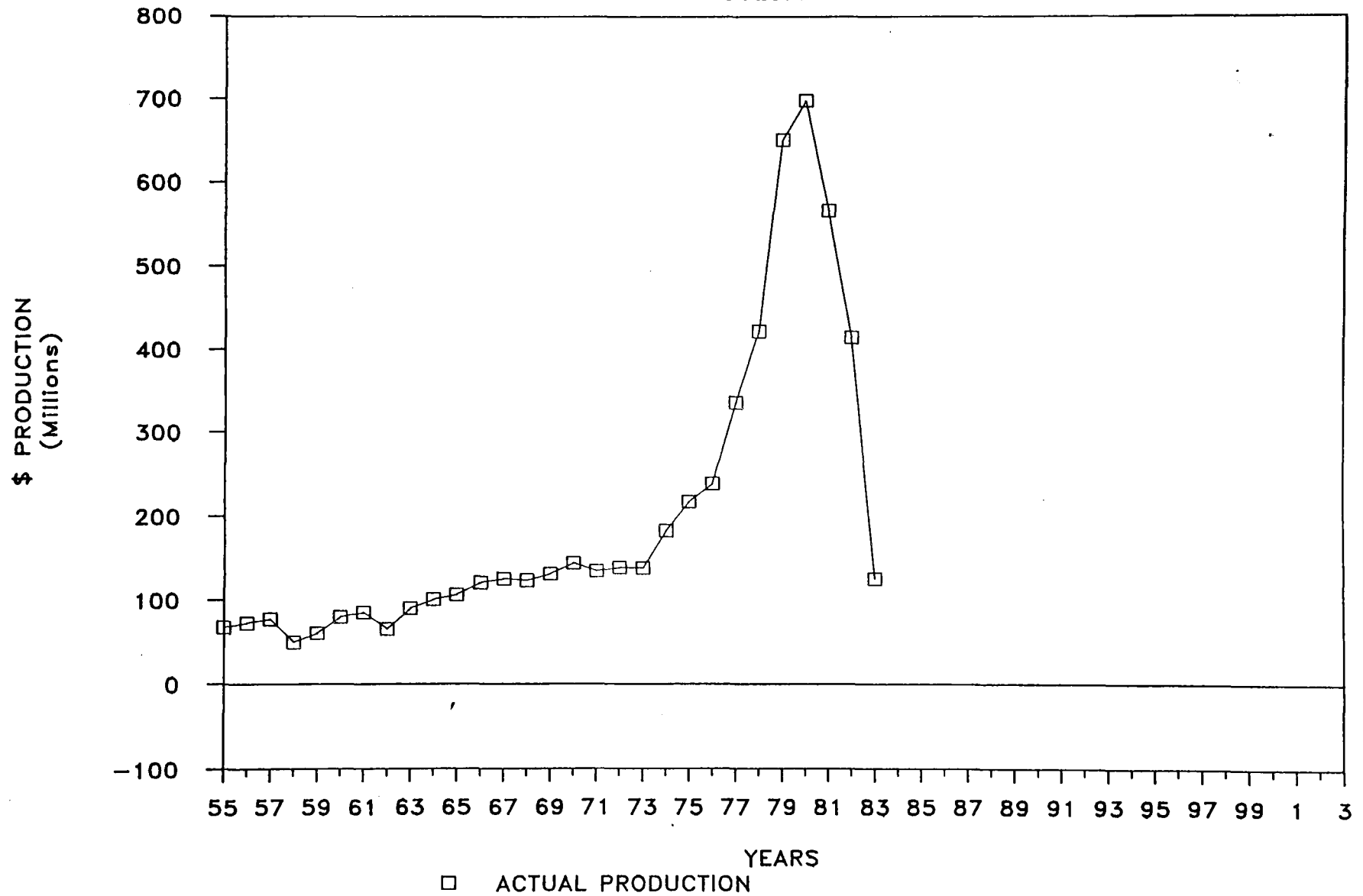
APPENDIX B

GRAPHS

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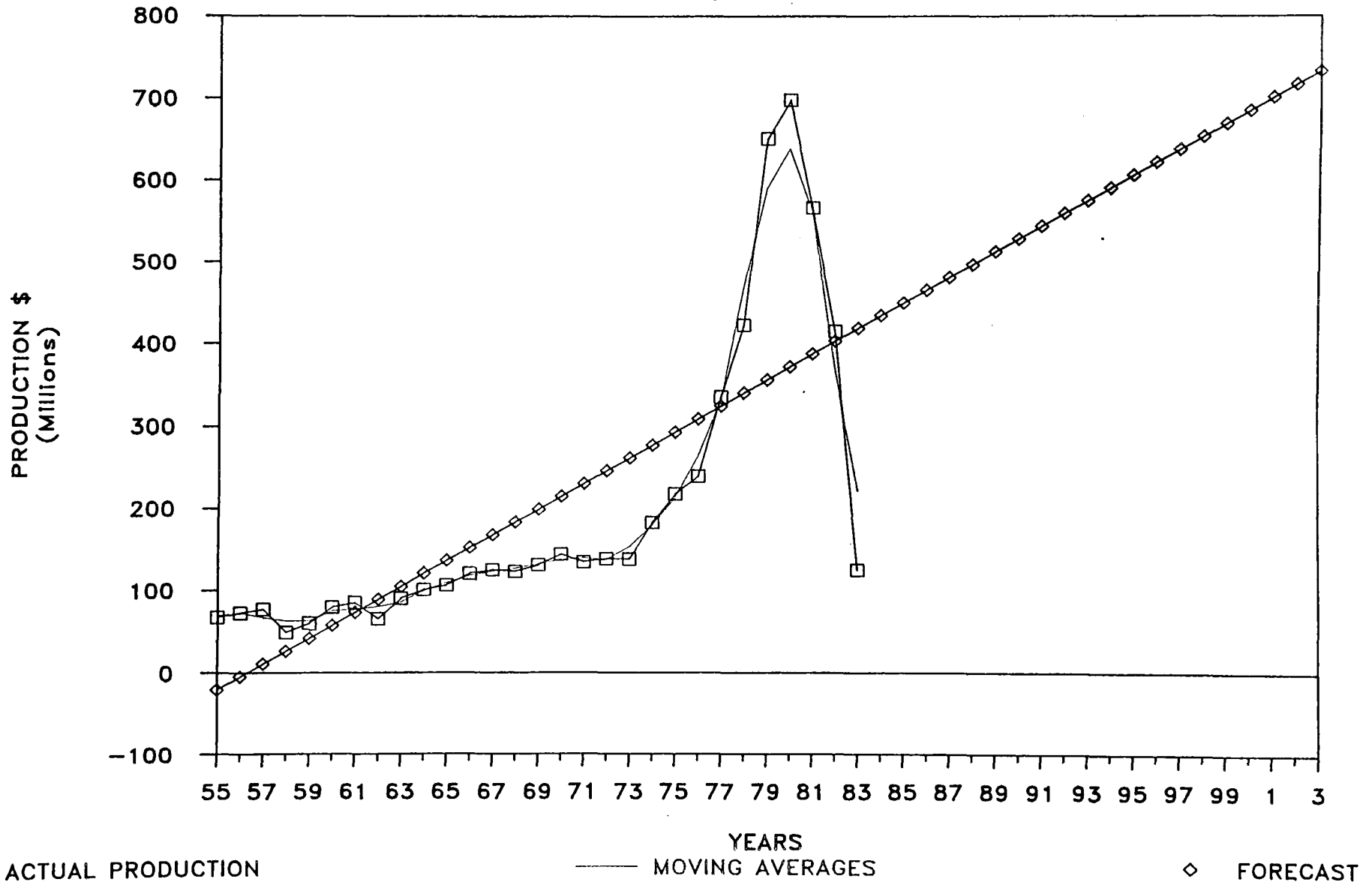
TOTAL METAL PRODUCTION

COLORADO



TOTAL METAL PRODUCTION

COLORADO



REVISED PROJECTION FOR METAL PRODUCTION
BASED ON ESTIMATED 1983 VALUE

YEAR	NOMINAL PRODUCTION	PRODUCER PRICE DEFLATED PRODUCTION
55	67841	84598
56	72786	89454
57	77419	91819
58	49686	57387
59	60865	69690
60	80135	90312
61	85415	95323
62	65900	72754
63	90709	98964
64	101065	108746
65	106841	113038
66	120924	124431
67	125513	125513
68	123587	118644
69	131662	119944
70	144529	124295
71	135316	111500
72	139332	111326
73	138725	104321
74	183556	124451
75	218545	135716
76	240071	140922
77	336103	185193
78	423459	216811
79	652099	300618
80	698993	283791
81	567395	208234
82	415860	144719
83	349821*	113342*
84	354676**	202675**
85	359530**	207529**
86	364385**	212384**
87	369239**	217238**
88	374094**	222093**
89	378948**	226947**
90	383803**	231802**
91	388657**	236656**
92	393512**	241511**
93	398366**	246366**
94	403221**	251220**
95	408075**	256075**
96	412930**	260929**
97	417784**	265784**
98	422639**	270638**
99	427493**	275493**
100	432348**	280347**
101	437202**	285202**
102	442057**	290056**

* - ESTIMATED VALUE. DEFLATED VALUE USES
PRODUCER PRICE DEFLATOR OF .324

** -PROJECTED VALUES

ALL VALUES EXPRESSED AS \$000

PROJECTED EMPLOYMENT FOR COLORADO MINING

YEARS	NOMINAL VALUE \$000 DEFLATED SLOPE	MANYEARS PER \$ 000' s	NUMBER EMPLOYED	HOURLY WAGE	TOTAL ANNUAL WAGES
55	67841				
56	72786				
57	77419				
58	49686				
59	60865				
60	80135			2.61	
61	85415			2.64	
62	65900			2.70	
63	90709			2.75	
64	101065			2.81	
65	106841			2.92	
66	120924			3.05	
67	125513			3.19	
68	123587			3.35	
69	131662			3.61	
70	144529			3.85	
71	135316			4.06	
72	139332			4.41	
73	138725			4.73	
74	183556			5.21	
75	218545			5.90	
76	240071			6.42	
77	336103			6.88	
78	423459	0.014	5981	7.67	95418
79	652099	0.010	6587	8.48	116184
80	698993	0.011	7586	9.19	145008
81	567395	0.014	7770	10.06	162586
82	415860	0.010	4159	10.82	93601
83	349821	0.012	4198	11.33	98928
84	354676	0.012	4256	11.90	105316
85	359530	0.012	4314	12.49	112096
86	364385	0.012	4373	13.12	119290
87	369239	0.012	4431	13.77	126923
88	374094	0.012	4489	14.46	135021
89	378948	0.012	4547	15.18	143612
90	383803	0.012	4606	15.94	152724
91	388657	0.012	4664	16.74	162389
92	393512	0.012	4722	17.58	172638
93	398366	0.012	4780	18.46	183506
94	403221	0.012	4839	19.38	195029
95	408075	0.012	4897	20.35	207246
96	412930	0.012	4955	21.36	220197
97	417784	0.012	5013	22.43	233925
98	422639	0.012	5072	23.55	248475
99	427493	0.012	5130	24.73	263896
100	432348	0.012	5188	25.97	280237
101	437202	0.012	5246	27.27	297553
102	442057	0.012	5305	28.63	315900

APPENDIX C

DATA SOURCES AND CONTACTS

Colorado Division of Mines
1313 Sherman Street
Denver, Colorado

Production Data

Data is available on a county by county basis from the late 1800's. Data is not complete, for any year part of all of the metal value for the county may be missing or may be aggregated into a single county amount. Data has not been collected after 1980. The definition of value for this data is 'amount produced in pounds, ounces, etc. times the average price for the metal that year, metal prices are as reported in trade journals, government reports or by the producer'.

U.S. Bureau of Mines
Karl Starch, Colorado Liaison
Phone 234-3930
Bldg. 20
Federal Center
Lakewood, Colorado.

Production Data

This data is collected on a yearly basis and is available about May or June of each year. The data is on a mine by mine basis for each county and by major metal types. All single mine data is confidential and much of the county data is confidential as well. There is not uranium data in these numbers. The definition of value is 'production measurement by mine shipment, sales, or marketable production (including consumption by the producer)'.

Department of Energy
Nuclear and Alternate Fuels Division
Energy Information Administration
R. Gene Clark
Phone 202-252-6363
Washington, DC

Uranium Production Data

All data pertaining to production of uranium has been transferred from the Grand Junction office of DOE to Washington.

U.S. Bureau of Mines
Harold Benette
Minerals Availability Field Office
Phone 234-6266
Bldg
Federal Center
Lakewood, Colorado

Mining Industry Cost Indices

Cost indices and an entire set of cost curves are available from this office. The indices are updated quarterly for a monthly basis, and can be obtained over the phone. The cost curves are divided into three mixes for any part of a mining operation; they are:

1. Labor
2. Material and supplies
3. Equipment operation

The cost curves in the form of a computer program are available to the survey free of charge except for the cost of the tape they would be written on.

Mine Safety and Health Administration
Lenard Larson
Phone 234-5991
Lakewood, Colorado

Employment Numbers

Employment on a mine by mine basis for each county in the state is available from this agency. The data is collected and published quarterly. The final numbers for a year are not available until the spring of the following year. The data is free and is apparently public data. However, the data is only available for the last five years. Another five years beyond are available but on magnetic tape and requires some computer programming to get the data in a usable form.

Colorado Division of Employment and Training
Ken McNulty
1330 Fox Street
Denver, Colorado

Employment Data

Data on employment for mining in each county is available on a metal and nonmetal basis. The data is available for 1972 to the present, with 1974 and 1975 missing. It is updated on a quarterly basis. However, it is confidential for most counties and may not agree with the MSHA data.

U.S. Department of Commerce
Monthly
Survey of Current Business

Economic Indicators

This monthly journal contains indicators such as the GNP deflator, Wholesale price index, Consumer price index, and many more. These indices are used to put historical data in constant dollars. This is the one source needed in order to carry out some of the more complex forecasting techniques.

William Chenoweth
Consulting Geologist
Grand Junction, Colorado

Uranium Production Data

Production data for the years 1965 to 1980.

APPENDIX D

TABLES OF HISTORICAL COUNTY METAL PRODUCTION

COUNTY: BOULDER

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	7	41	27	0	5	0	80
56	8	37	24	0	4	0	73
57	4	8	8	0	1	0	21
58	0	4	1	0	0	0	5
59	1	0	0	0	0	0	1
60	2	7	2	0	0	0	11
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	8	2	0	0	0	0	10
64	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	15	3	0	0	0	0	18
68	5	2	0	0	0	0	7
69	3	1	0	0	0	0	4
70	20	0	0	0	0	0	20
71	0	0	8	0	0	0	8
72	0	0	4	0	0	0	4
73	0	0	2	0	0	0	2
74	0	2	0	0	0	0	2
75	72	1	0	0	0	0	73
76	0	1	0	0	0	0	1
77	76	64	7	9	0	0	156
78	173	117	13	0	1	0	304
79	210	291	16	13	4	0	534
80	217	7	0	0	0	0	224
81	150	90	5	5	0	0	250
82	40	20	0	0	0	0	60

COUNTY: CHAFFEE

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	0	1	0	0	0	0	1
56	0	1	0	0	0	0	1
57	0	3	16	0	0	0	19
58	0	1	5	0	0	0	6
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	2	4	0	0	6
64	0	0	9	9	0	0	18
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0

COUNTY: CLEAR CREEK

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	20	20	27	3	4	0	74
56	142	50	90	41	28	0	351
57	116	50	89	50	27	0	332
58	37	15	35	0	5	0	92
59	66	19	30	0	9	0	124
60	59	21	32	0	9	0	121
61	0	10	2	1	0	0	13
62	4	9	6	2	0	0	21
63	1	312	5	7	2	0	327
64	1	172	7	2	1	0	183
65	0	0	0	0	0	0	0
66	5	3	7	0	1	0	16
67	4	3	8	0	2	2117	2134
68	0	86	1	0	0	13069	13156
69	0	0	0	0	0	12871	12871
70	0	6	4	3	0	13994	14007
71	1	0	0	0	0	12543	12544
72	0	0	0	0	0	12073	12073
73	0	0	0	0	0	9178	9178
74	0	1	4	8	0	8118	8131
75	0	6	21	40	0	8380	8447
76	6	1	5	10	0	8643	8665
77	0	0	0	0	0	87416	87416
78	0	0	0	0	0	145067	145067
79	7	6	10	4	1	281511	281539
80	4	0	0	0	0	303784	303788
81	30	20	5	0	0	232000	232055
82	55	35	15	5	5	160220	160335

COUNTY: CONEJOS

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
66	13	12	0	0	0	0	25
67	6	12	0	0	0	0	18
68	15	23	0	0	0	0	38
69	40	60	0	0	0	0	100
70	23	52	0	0	0	0	75
71	1	2	0	0	0	0	3
72	45	47	0	0	0	0	92
73	52	47	0	0	0	0	99
74	38	31	0	0	0	0	69
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0

COUNTY: CUSTER

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	3	2	1	0	4	0	10
56	3	1	2	0	4	0	10
57	3	1	1	0	4	0	9
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	0	5	6	4	0	0	15
65	0	11	10	14	0	0	35
66	0	11	10	14	0	0	35
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	1	0	0	0	0	1
70	0	1	2	0	0	0	3
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0

COUNTY: DOLORES

HISTORICAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	6	94	659	667	7	0	1433
56	7	94	750	702	9	0	1562
57	7	10	50	61	9	0	137
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	8	249	90	0	0	347
61	0	45	171	83	0	0	299
62	3	46	150	232	4	0	435
63	3	46	149	254	4	0	456
64	2	22	265	129	2	0	420
65	1	14	364	264	2	0	645
66	2	15	586	482	2	0	1087
67	2	12	487	440	22	0	963
68	2	8	436	377	8	0	831
69	5	176	346	526	48	0	1101
70	7	195	418	488	139	0	1247
71	9	119	184	239	154	0	705
72	13	147	56	75	183	0	474
73	34	149	90	87	111	0	471
74	66	265	17	0	126	0	474
75	32	97	3	0	29	0	161
76	350	128	5	0	0	0	483
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0

COUNTY: EAGLE

HISTORICAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	315	1494	915	5215	1650	0	9589
56	321	710	1300	5250	700	0	8281
57	107	836	1337	6158	734	0	9172
58	0	400	1078	6889	300	0	8667
59	0	380	760	5126	250	0	6516
60	0	300	1206	3735	300	0	5541
61	0	400	1145	5395	250	0	7190
62	215	622	691	5719	319	0	7566
63	193	723	848	7084	209	0	9057
64	125	833	1173	6696	400	0	9227
65	100	840	1307	5671	453	0	8371
66	121	1110	877	6457	690	0	9255
67	42	470	635	5774	360	0	7281
68	71	71	675	6241	42	0	7100
69	0	100	724	4225	0	0	5049
70	21	225	539	4102	1	0	4888
71	52	517	517	3879	155	0	5120
72	20	132	423	3848	0	0	4423
73	29	276	397	3902	22	0	4626
74	59	644	453	6191	97	0	7444
75	63	624	353	5161	119	0	6320
76	24	307	359	4788	21	0	5499
77	81	791	584	3861	92	0	5409
78	86	814	0	121	185	0	1206
79	146	2492	0	0	184	0	2822
80	249	4626	0	0	63	0	4938
81	425	2575	20	175	120	0	3315
82	0	0	0	0	0	0	0

COUNTY: GILPIN

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	15	17	39	5	4	0	80
56	17	16	40	6	4	0	83
57	6	5	3	4	2	0	20
58	2	2	0	0	0	0	4
59	1	1	0	0	0	0	2
60	1	0	0	0	0	0	1
61	16	1	2	2	1	0	22
62	12	1	4	0	0	0	17
63	0	2	0	0	0	0	2
64	3	0	2	3	1	0	9
65	0	0	0	0	0	0	0
66	1	0	0	0	0	0	1
67	2	4	0	0	0	0	6
68	1	1	0	0	0	0	2
69	1	0	0	0	0	0	1
70	0	0	0	0	0	0	0
71	2	0	3	5	0	0	10
72	5	2	1	3	1	0	12
73	1	0	0	0	0	0	1
74	2	5	2	2	0	0	11
75	15	6	1	0	1	0	23
76	33	6	3	0	8	0	50
77	3	1	0	0	0	0	4
78	0	0	0	0	0	0	0
79	18	0	0	0	0	0	18
80	83	0	0	0	0	0	83
81	70	0	5	0	0	0	75
82	100	5	5	0	0	0	110

COUNTY: GUNNISON

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	2	139	267	290	126	0	824
56	23	401	655	1200	485	0	2764
57	14	225	477	158	320	0	1194
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	16	36	71	2	0	125
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	2	286	147	324	133	0	892
64	4	618	647	600	647	0	2516
65	4	523	793	1223	263	0	2806
66	3	516	903	2245	176	0	3843
67	4	248	315	614	100	0	1281
68	0	0	0	0	0	0	0
69	1	91	113	151	55	0	411
70	0	0	49	49	19	0	117
71	0	5	9	0	0	0	14
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	109	89	99	0	0	297
75	4	33	76	120	8	0	241
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0

COUNTY: HINSDALE

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	0	0	1	0	0	0	1
56	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	1	6	0	0	0	0	7
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	1	1	0	0	0	0	2
64	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	1	6	37	11	0	0	55
68	0	2	2	1	0	0	5
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	48	43	74	0	0	165
77	0	10	2	4	0	0	16
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0

COUNTY: JEFFERSON

HISTORICAL METAL PRODUCTION DATA \$000'S

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	12	0	0	0	0	0	12
56	12	0	0	0	0	0	12
57	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	17	0	0	0	0	0	17
62	17	0	0	0	0	0	17
63	3	0	0	0	0	0	3
64	2	0	0	0	0	0	2
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	2	0	0	0	0	0	2
70	2	0	0	0	0	0	2
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	23	0	0	0	0	0	23
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0

COUNTY: LAKE

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	175	90	417	410	15	45536	46643
56	180	85	515	545	101	44273	45699
57	250	400	1112	1844	245	50109	53960
58	0	0	0	0	0	30472	30472
59	2	0	1	0	0	45695	45698
60	8	2	1	0	3	62000	62014
61	0	0	0	0	0	65000	65000
62	0	0	0	0	0	46695	46695
63	0	0	0	0	0	66393	66393
64	0	0	0	0	0	72832	72832
65	0	0	0	0	0	78026	78026
66	0	0	0	0	0	87212	87212
67	0	0	0	0	0	94189	94189
68	0	0	0	0	0	83870	83870
69	0	0	0	0	0	90054	90054
70	0	0	0	0	0	100722	100722
71	0	78	1111	1000	0	92846	95035
72	597	834	1236	1687	3	90839	95196
73	665	1529	1153	3435	24	87476	94282
74	774	1756	1710	5403	0	115898	125541
75	83	1548	1343	5291	0	146637	154902
76	796	4946	1783	3879	0	174805	186209
77	791	6986	2338	4311	0	189122	203548
78	844	7627	2380	3517	0	232701	247069
79	1788	12666	3987	4747	5	322756	345949
80	3331	14403	2873	4200	0	316288	341095
81	4905	10995	5840	11565	225	254000	287530
82	4555	2650	3560	3560	125	200405	214855

COUNTY: LA PLATA

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	16	1	0	0	0	0	17
56	18	2	0	0	0	0	20
57	18	10	0	0	0	0	28
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	1	0	0	0	0	1
62	4	1	0	0	0	0	5
63	0	0	0	0	0	0	0
64	5	2	0	0	0	0	7
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	5	0	0	0	0	5

COUNTY: MINERAL

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	36	122	361	184	15	0	718
56	52	175	450	350	17	0	1044
57	51	174	350	301	14	0	890
58	30	104	353	316	1	0	804
59	26	114	284	190	0	0	614
60	26	260	372	444	63	0	1165
61	23	288	422	437	92	0	1262
62	21	304	407	615	163	0	1510
63	16	378	273	449	65	0	1181
64	18	384	434	611	155	0	1602
65	23	231	525	593	201	0	1573
66	23	157	502	506	213	0	1401
67	24	246	563	687	0	0	1520
68	29	279	541	590	105	0	1544
69	30	1835	743	456	154	0	3218
70	21	3268	911	466	122	0	4788
71	0	2306	494	0	0	0	2800
72	5	2596	395	138	50	0	3184
73	0	4600	500	0	0	0	5100
74	25	5477	777	95	22	0	6396
75	2854	6423	1739	2409	360	0	13785
76	0	5649	960	0	0	0	6609
77	0	8064	971	0	0	0	9035
78	0	10348	986	0	0	0	11334
79	0	14923	2459	0	0	0	17382
80	0	23766	1837	0	0	0	25603
81	0	13670	890	690	145	0	15395
82	0	10055	425	135	140	0	10755

COUNTY: MONTEZUMA

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0
58	3	0	0	0	0	0	3
59	2	3	0	0	0	0	5
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	8	0	0	0	0	0	8
64	7	0	0	0	0	0	7
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	2	3	0	0	0	0	5
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0

COUNTY: OURAY

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	117	45	204	111	126	0	603
56	120	50	251	140	150	0	711
57	72	61	170	200	122	0	625
58	235	164	440	648	334	0	1821
59	185	127	470	723	349	0	1854
60	172	148	621	979	416	0	2336
61	462	387	901	1539	790	0	4079
62	320	258	540	1020	560	0	2698
63	238	276	593	965	468	0	2540
64	287	242	598	942	397	0	2466
65	266	189	742	997	388	0	2582
66	222	358	862	1326	500	0	3268
67	133	392	722	1276	620	0	3143
68	146	542	738	1176	664	0	3266
69	172	392	721	1058	695	0	3038
70	169	309	750	1186	845	0	3259
71	166	281	880	1470	810	0	3607
72	331	397	1907	3123	1234	0	6992
73	427	296	1747	2041	622	0	5133
74	604	532	2231	3530	1515	0	8412
75	439	1110	1556	4999	1122	0	9226
76	289	958	1993	4974	1039	0	9253
77	366	454	1199	2298	409	0	4726
78	241	245	830	1361	239	0	2916
79	0	0	0	0	0	0	0
80	36	779	50	0	2	0	867
81	100	980	160	190	50	0	1480
82	0	5	0	0	0	0	5

COUNTY: PARK

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	1	1	2	0	2	0	6
56	1	1	3	0	3	0	8
57	6	10	15	0	0	0	31
58	0	32	169	10	0	0	211
59	4	31	110	0	0	0	145
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	3	1	0	0	0	0	4
63	0	1	0	0	0	0	1
64	3	1	0	0	0	0	4
65	2	0	0	0	0	0	2
66	1	0	0	0	0	0	1
67	0	0	0	0	0	0	0
68	8	3	1	5	0	0	17
69	8	2	0	6	1	0	17
70	1	1	0	0	0	0	2
71	2	0	0	0	0	0	2
72	4	0	0	0	0	0	4
73	5	0	0	0	0	0	5
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	6	0	0	0	0	0	6
78	5	10	0	0	0	0	15
79	199	71	0	0	0	0	270
80	1232	238	30	0	0	0	1500
81	170	710	60	25	10	0	975
82	195	355	20	0	0	0	570
							0

COUNTY: SAGUACHE

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	1	2	16	7	1	0	27
56	1	2	16	8	1	0	28
57	5	11	12	10	0	0	38
58	8	14	110	117	21	0	270
59	1	9	38	69	0	0	117
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0

COUNTY: SAN JUAN

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	17	32	146	52	30	0	277
56	19	31	146	57	29	0	282
57	35	22	104	36	25	0	222
58	27	12	56	36	9	0	140
59	0	0	0	0	0	0	0
60	80	101	185	37	227	0	630
61	7	7	16	9	11	0	50
62	15	53	178	307	38	0	591
63	46	206	711	1123	149	0	2235
64	50	342	1194	2036	394	0	4016
65	74	342	1511	2845	366	0	5138
66	150	388	1631	2856	331	0	5356
67	104	496	1898	2923	391	0	5812
68	149	615	1177	2423	393	0	4757
69	309	618	2093	3007	587	0	6614
70	572	600	2250	2928	711	0	7061
71	1135	485	1586	2815	660	0	6681
72	1636	507	1648	3127	0	0	6918
73	3561	866	1470	3031	603	0	9531
74	4264	1032	1099	3751	362	0	10508
75	4362	920	1476	3322	398	0	10478
76	2756	815	1298	3640	255	0	8764
77	5593	1267	2251	4149	384	0	13644
78	3199	643	1004	1788	166	0	6800
79	1622	418	171	106	18	0	2335
80	14843	2005	1011	1454	167	0	19480
81	15895	2525	2205	3445	500	0	24570
82	16045	2215	2270	4710	650	0	25890

COUNTY: SAN MIGUEL

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	661	412	1523	1611	1184	0	5391
56	780	651	2290	3500	2400	0	9621
57	742	801	2375	3000	2100	0	9018
58	705	491	1321	2142	1002	0	5661
59	549	371	1380	2162	1047	0	5509
60	524	443	1715	2816	1243	0	6741
61	642	483	1379	2430	1314	0	6248
62	618	565	1294	2415	1444	0	6336
63	623	723	1764	2858	1371	0	7339
64	863	670	2185	2804	1193	0	7715
65	793	512	2185	2988	1161	0	7639
66	649	787	2418	3920	1650	0	9424
67	392	1080	2114	3723	1784	0	9093
68	420	1307	2082	3358	1827	0	8994
69	515	1189	2196	3199	2082	0	9181
70	505	900	1749	2819	2365	0	8338
71	495	748	1819	3529	2196	0	8787
72	975	879	2265	3764	2077	0	9960
73	1291	1002	2238	3788	1931	0	10250
74	1816	1691	3026	6955	2755	0	16243
75	1233	1744	2586	7101	2161	0	14825
76	801	1423	2878	7194	1659	0	13955
77	1087	915	2830	5661	1116	0	11609
78	724	736	2490	4082	716	0	8748
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0
82	35	0	0	0	0	0	35

COUNTY: SUMMIT

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	9	16	158	157	7	0	347
56	9	16	169	170	6	0	370
57	4	9	25	15	0	0	53
58	0	0	0	0	0	0	0
59	4	0	0	0	0	0	4
60	1	0	0	0	0	0	1
61	3	3	24	20	1	0	51
62	2	3	0	0	0	0	5
63	11	39	173	32	2	0	257
64	0	13	9	3	0	0	25
65	0	2	18	4	0	0	24
66	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	50	0	0	0	0	0	50
81	30	65	0	0	0	0	95
82	0	0	0	0	0	0	0

COUNTY: TELLER

HISTORICAL METAL PRODUCTION DATA \$000's

COLORADO DIVISION OF MINES DATA

YEAR	AU	AG	PB	ZN	CU	MO	TOTAL
55	1701	7	0	0	0	0	1708
56	1860	6	0	0	0	0	1866
57	1645	5	0	0	0	0	1650
58	1525	5	0	0	0	0	1530
59	1135	41	0	0	0	0	1176
60	1095	0	0	0	0	0	1095
61	1183	0	0	0	0	0	1183
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	47	0	0	0	0	0	47
74	0	0	0	0	0	0	0
75	64	0	0	0	0	0	64
76	408	10	0	0	0	0	418
77	526	8	0	0	0	0	534
78	0	0	0	0	0	0	0
79	1250	0	0	0	0	0	1250
80	1365	0	0	0	0	0	1365
81	1655	0	0	0	0	0	1655
82	3230	10	0	0	0	0	3240