

WAGE STATISTICS AND COPPER OUTPUT IN

ARIZONA COPPER MINES

Years 1950-1957 Compared With Base Period 1947-1949

Source: Arizona Employment Security Commission and U. S. Bureau of Mines

The Arizona Department of Mineral Resources has recently compiled several tables of wage statistics and copper output of Arizona copper mines, and has compared them with wages paid in other major industries in Arizona and the United States.

The base period of 1947-1949 has been used in making comparisons because that is the period used by the U. S. Department of Labor in determining the Consumer Price Index (or Cost of Living).

As in previous reports, the Arizona Department of Mineral Resources has shown that hourly wage-rates in the copper mining industry have been increased annually at a much greater rate than the Consumer Price Index.

The copper miner's output has been a poor measure of his worth, because of many factors beyond his control. A lowering of metal content of copper ore would have an effect on the output of copper per man-hour of labor, and the miner can hardly be responsible for this. Neither does he have control of the market-price of the metal which is affected by world conditions of production, consumption, imports and exports, etc. To be sure, stopping production by a strike would result in a shortage of supply and an automatic increase in the price, but this would be a negative control and only one of many factors affecting market-price.

Increased output of copper ore per man-hour is more than likely due to the larger proportion of open-pit production by the use of mechanized shovels. The proportion of open pit ore tonnage has increased from 30% in 1940 to over 82% in 1956. This proportion has been reduced to about 78% in 1957, due to the new large underground mine at San Manuel reaching full production during the year. Technological advances in both open-pit and underground mining, especially in the developments of improvements in mechanized equipment, have been the chief factor in increased output per man. Likewise, in the milling of the ore, increase in recovery has been entirely due to technological and mechanical improvements. The big copper producers have spent millions of dollars in technological research.

It seemed fitting that, in making comparisons of output per man, the full number of covered employees in the copper mining, milling and smelting business in Arizona be used, rather than the number of copper miners only. It can hardly be denied that each and every individual employee of a copper company has a hand in the production of each pound of copper. The total Arizona copper mining, milling and smelting payroll, as a matter of fact, really falls short of the total direct labor involved in the production of copper. There is still the labor on the railroads transporting the blister copper to the east coast for refining, and the labor at the copper refineries. The indirect labor involved in the production, manufacture and transportation of supplies and equipment to the copper mines, mills and smelters in Arizona would further increase labor's proportion in the cost of producing copper.

Because the by-products of gold and silver produced with the copper are factors in determining the value of the miner's output, the total value of metal produced is converted into pounds of copper at the average copper price.

Although the year 1957 witnessed a collapse of copper prices from a high of 36 cents in January to a low of 26 cents in December, the copper miner's base hourly wage has continued to rise, due to a three-year union contract made in June of 1956 when copper was selling for 46 cents a pound. This contract called for wage increases in July of the years 1956, 1957 and 1958. The producers are now asking 25 cents per pound for their copper, yet the base hourly wage will go up about 5 to 10 cents an hour in July of this year.

Comparing results for the year 1957 with the base-period, 1947-1949, and summarizing briefly, it is found that the tons ore per man-hour of copper, milling and smelting, increased 25.72% from 1.221 tons per man-hour to 1.535 tons, and the pounds of copper (incl. gold-silver equivalent) increased 10.43%, from 23.98 lbs. per man-hour to 26.48 lbs. At the same time, average annual wages of each employee increased 65.91%, from \$3,496 to \$5,792, while the cost of living increased only 20.2%.

A table has been added to this report to show the base hourly rate of copper miners. This rate is not shown in the Employment Security Commission reports. Their reports show the actual hours worked each week and include overtime earnings in their weekly earnings column. The base hourly rate is obtained by dividing the weekly earnings by the weekly hours plus one-half the overtime hours in excess of 40 hours per week.

If the price of copper had followed the curve of the rise in wages, we would have had a 35.9 cent price in March of this year, instead of 24.018 cents, as quoted by the Engineering and Mining Journal. The base hourly wage-rate in the base period was \$1.359, and in March 1958, it was \$2.345, a rise of 72.55 percent. The average price of copper during the base period was 20.818 cents, and a rise of 72.55 percent would make the price 35.9 cents.

Copper mining and smelting wages in 1957 amounted to \$95,877,376 and do not include fringe benefits which are estimated to amount to 18-20 percent of the regular payroll.

TABLE I

ESTIMATED HOURS AND EARNINGS IN SELECTED INDUSTRIES IN ARIZONA

YEAR 1957

Source: "Arizona Current Employment Developments" Employment Security Commission

These estimates are based upon a sample of full and part-time production and related employees whose payroll and hours are reported for the pay period ending nearest the 15th of the month.

<u>1957:</u>	<u>Average Employment</u>	<u>Average Hourly Earnings</u>	<u>Average Weekly Hours</u>	<u>Average Weekly Earnings</u>
Copper Mining	14,000	\$ 2.425	43.80	\$ 106.22
Manufacturing (Total)	39,300	2.231	40.59	90.56
" (Copper Smelting Only)	1,900	2.310	47.09	108.78
" (Excl. Smelting)	37,400	2.227	40.26	89.66
Contract Construction	21,300	2.967	36.41	108.03
Utilities	21,600	2.044	41.13	84.07
Retail Trade	52,600	1.578	41.10	64.86
Wholesale Trade	12,500	2.069	41.14	85.12

OTHER NON-AGRICULTURAL EMPLOYMENT *

	<u>Average Employment</u>
Mining & Quarrying (Excl. copper mining)	2,500
Finance, Insurance, Real Estate	10,400
Services & Miscellaneous	33,500
Federal Government	18,400
State & Local Government (Incl. Education)	36,000
Education	18,400
 TOTAL NON-AGRICULTURAL EMPLOYMENT	 262,000

* No wage records reported.

TABLE II

MONTHLY STATISTICS IN 1957 OF EMPLOYMENT, WEEKLY EARNINGS, WEEKLY HOURS
AND HOURLY EARNINGS IN COPPER MINING, COPPER SMELTING, MANUFACTURING,
CONTRACT CONSTRUCTION, UTILITIES, WHOLESALE AND RETAIL TRADE.

Source: Arizona Employment Security Commission

<u>COPPER MINING:</u>				
<u>1957</u>	<u>Employment</u>	<u>Avg. Weekly Earnings</u>	<u>Avg. Weekly Hours</u>	<u>Avg. Hourly Earnings</u>
January	13,700	\$109.84	45.2	\$2.43
February	13,800	111.56	46.1	2.42
March	13,900	111.02	45.5	2.44
April	14,000	110.38	45.8	2.41
May	14,100	109.17	45.3	2.41
June	14,200	108.58	44.5	2.44
July	14,100	104.99	43.0	2.43
August	14,200	102.55	42.2	2.43
September	14,000	103.58	42.8	2.42
October	13,900	101.57	41.8	2.43
November	13,900	98.01	40.5	2.42
December	13,900	103.82	42.9	2.42
AVERAGE	14.000	\$106.22	43.80	\$2.425
<u>COPPER SMELTING:</u>				
<u>1957</u>				
January	1,873	\$112.08	48.9	\$2.29
February	1,866	112.74	49.0	2.30
March	1,859	111.71	48.8	2.29
April	1,868	106.76	46.6	2.29
May	1,902	108.40	47.5	2.28
June	1,987	109.26	47.3	2.31
July	1,938	107.48	45.9	2.34
August	1,949	106.81	45.8	2.33
September	1,895	114.39	48.7	2.35
October	1,868	110.42	47.2	2.34
November	1,901	103.81	44.9	2.31
December	1,904	101.46	44.5	2.28
AVERAGE	1,901	\$108.78	47.1	\$2.310
<u>TOTAL MANUFACTURING (Incl. Copper Smelting)</u>				
<u>1957</u>				
January	37,700	\$ 93.66	42.0	\$2.23
February	38,300	90.64	41.2	2.20
March	38,000	89.06	40.3	2.21
April	38,700	89.69	40.4	2.22
May	39,300	90.35	40.7	2.22
June	40,200	89.20	40.0	2.23
July	40,300	91.21	40.9	2.23
August	40,000	91.30	40.4	2.26
September	39,900	91.94	40.7	2.27
October	40,100	90.90	40.4	2.25
November	39,900	87.30	39.5	2.21
December	38,800	90.94	40.6	2.24
AVERAGE	39,300	\$ 90.56	40.59	\$2.231

Continued -

MONTHLY LABOR STATISTICS

Cont'd

CONTRACT CONSTRUCTION:

<u>1957</u>	<u>Employment</u>	<u>Avg. Weekly Earnings</u>	<u>Avg. Weekly Hours</u>	<u>Avg. Hourly Earnings</u>
January	20,000	\$ 95.37	33.0	\$2.89
February	20,100	108.33	37.1	2.92
March	20,000	104.98	36.2	2.90
April	19,300	107.88	37.2	2.90
May	19,100	107.38	36.9	2.91
June	19,400	111.08	37.4	2.97
July	20,100	110.04	37.3	2.95
August	23,000	112.72	37.7	2.99
September	23,400	116.13	35.5	3.04
October	23,700	108.58	35.6	3.05
November	23,600	104.58	34.4	3.04
December	23,600	117.34	38.6	3.04
AVERAGE	21,300	\$108.03	36.41	\$2.967

UTILITIES:

<u>1957</u>				
January	21,600	\$ 82.20	41.1	\$2.00
February	21,600	81.60	40.8	2.00
March	21,400	81.36	41.3	1.97
April	21,300	81.40	40.7	2.00
May	21,300	84.26	41.1	2.05
June	21,800	85.28	41.2	2.07
July	21,800	85.70	41.4	2.07
August	21,700	85.70	41.6	2.06
September	21,600	84.04	40.6	2.07
October	21,600	84.26	41.1	2.05
November	21,600	87.15	41.9	2.08
December	21,500	85.88	40.7	2.11
AVERAGE	21,600	\$ 84.07	41.13	\$2.044

TRADE:

<u>1957</u>				
January	62,400	\$ 67.90	41.5	\$1.64
February	62,100	67.51	41.2	1.64
March	62,900	67.83	41.0	1.66
April	62,900	68.59	41.2	1.67
May	62,700	68.37	41.1	1.67
June	62,600	70.05	41.7	1.68
July	62,600	69.80	41.5	1.69
August	66,800	70.65	41.7	1.70
September	67,600	69.74	40.8	1.70
October	67,700	69.02	40.6	1.70
November	68,600	68.32	40.4	1.70
December	71,800	67.59	40.8	1.66
AVERAGE	65,100	\$ 68.78	41.11	\$1.673

TABLE III

ESTIMATED HOURS AND EARNINGS IN SELECTED INDUSTRIES IN ARIZONA

These estimates are based upon a sample of full and part-time production and related employees whose payroll and hours are reported for the pay period ending nearest the 15th of the month.

Prepared by Arizona Employment Security Commission in co-operation with the
U. S. Bureau of Labor Statistics.

	1947-49	1951	1954	1956	1957
<u>Average Hourly Earnings:</u>					
Manufacturing **	\$ 1.345	\$ 1.55	\$ 1.949*	\$ 2.144	\$ 2.231
Copper Mining	1.432	1.74	2.132	2.377	2.425
Contract Const.	1.787	2.15	2.555	2.810	2.967
Utilities	1.369	1.54	1.810	1.929	2.044
Trade	1.090	1.32	1.513	1.618	1.672
<u>Average Weekly Hours:</u>					
Manufacturing	41.60	43.1	41.41	42.27	40.59
Copper Mining	44.83	47.7	45.31	47.15	43.80
Contract Const.	37.10	38.0	37.02	37.39	36.41
Utilities	41.39	40.1	40.83	40.78	41.13
Trade	41.98	42.8	41.93	41.37	41.11
<u>Average Weekly Earnings:</u>					
Manufacturing	\$ 55.95	\$ 66.81	\$ 80.71	\$ 90.63	\$ 90.56
Copper Mining	64.20	83.01	96.60	112.07	106.22
Contract Const.	66.30	81.70	94.59	105.09	108.03
Utilities	56.66	61.75	73.90	78.66	84.07
Trade	45.76	56.50	63.44	66.94	68.74
<u>Weekly Earnings Index (1947-1949 = 100):</u>					
Manufacturing	100.0	119.4	144.3	162.0	161.9
Copper Mining	100.0	129.3	150.5	174.6	165.5
Contract Const.	100.0	123.2	142.7	158.5	162.9
Utilities	100.0	109.0	130.4	138.8	148.4
Trade	100.0	123.5	138.6	146.3	150.2
<u>Consumer Price Index:</u>					
	100.0	111.0	114.8	116.2	120.2
<u>Copper Price Index:</u>					
	100.0	116.2	142.7	200.8	142.1

* Beginning July 1952, Manufacturing includes aircraft modification operations.

** Manufacturing includes copper smelting.

TABLE IV

COMPARISON OF AVERAGE WEEKLY EARNINGS, WEEKLY HOURS
AND HOURLY EARNINGS OF PRODUCTION WORKERS OR
NONSUPERVISORY EMPLOYEES IN SELECTED INDUSTRIES
OF THE UNITED STATES AND STATE OF ARIZONA

YEAR 1957

Source: Arizona Employment Security Commission
U.S. Dept. of Labor "Employment and Earnings"
February, 1958.

The Arizona Department of Mineral Resources is presenting herewith a table showing the comparison of average weekly earnings, weekly hours and hourly earnings of production workers or nonsupervisory employees in selected industries of the United States and of the State of Arizona, for the year 1957. Sufficient data were not available to show a similar comparison for the Utilities industries.

<u>Year 1957</u>			<u>Avg. Weekly Earnings</u>	<u>Avg. Weekly Hours</u>	<u>Avg. Hourly Earnings</u>
Copper Mining	-	United States	\$ 98.23	41.1	\$ 2.39
" "	-	Arizona	106.22	43.80	2.425
Manufacturing	-	United States	82.39	39.8	2.07
" "	-	Arizona	90.56	40.59	2.231
Contract Construction-	-	United States	106.64	36.9	2.89
" "	-	Arizona	108.03	36.41	2.967
Retail Trade	-	United States	62.87	38.1	1.65
" "	-	Arizona	64.86	41.10	1.578
Wholesale Trade	-	United States	84.42	40.2	2.10
" "	-	Arizona	85.12	41.14	2.069

Arizona Department of Mineral Resources

May, 1958

TABLE V

AVERAGE NUMBER OF COVERED EMPLOYEES, TOTAL WAGES, AVERAGE ANNUAL WAGE, AND AVERAGE WEEKLY WAGE

Base period 1947-1949, 1951, 1956 & 1957

Arizona Covered Industry

Compiled by Department of Mineral Resources

Source: Arizona Employment Security Commission

	Average No. of Employees *	Total Wages	Average Annual Wage	Average Weekly Wage	Average No. of Employees *	Total Wages	Average Annual Wage	Average Weekly Wage
	Base Period 1947 - 1949				Year 1951			
Copper Mining Only	11,278	\$ 39,432,008	\$3,496	\$67.23	10,754	\$ 47,825,698	\$4,447	\$ 85.52
All Mining & Quarrying	12,870	44,345,018	3,446	66.27	12,600	54,504,083	4,326	83.19
Smelting **	1,500	5,175,000	3,450	66.35	1,600	7,115,200	4,447	85.52
All Min., Quar., & Smelting	14,370	49,520,018	3,446	66.27	14,200	61,619,283	4,339	83.44
Manufacturing (Excl. Smelt'g)	12,639	36,910,624	2,920	56.15	16,442	57,376,602	3,490	67.12
Construction	10,844	35,424,826	3,267	62.83	12,775	51,789,225	4,054	77.96
Transp. & Utilities (Excl. RR's)	10,530	29,948,944	2,844	54.69	11,698	40,417,858	3,455	66.44
Wholesale-Retail Trade	36,213	91,916,860	2,538	48.81	41,316	118,864,726	2,877	55.33
Services & Misc. (Incl. Agri.)	18,643	43,103,526	2,312	44.46	24,937	72,021,402	2,888	55.54
Totals and Averages	103,239	\$286,824,898	\$2,778	\$53.42	121,368	402,089,096	3,313	63.72
	Year 1956				Year 1957			
Copper Mining Only	14,008	\$ 83,568,996	\$5,966	\$114.73	14,653	\$ 85,125,320	5,809	111.71
All Mining & Quarrying	16,439	94,693,048	5,760	110.77	17,072	96,566,625	5,656	108.78
Smelting **	1,750	10,088,260	5,765	110.86	1,901	10,752,056	5,656	108.78
All Min., Quar., & Smelting	18,189	104,781,308	5,761	110.79	18,973	107,318,681	5,656	108.78
Manufacturing (Excl. Smelt'g)	33,366	161,544,656	4,842	93.12	37,017	184,777,113	4,992	96.00
Construction	20,724	104,126,340	5,024	96.62	23,319	120,265,706	5,157	99.17
Transp. & Utilities (Excl. RR's)	15,639	69,562,004	4,448	85.54	16,328	75,710,724	4,637	89.17
Wholesale-Retail Trade	57,359	202,062,109	3,523	67.75	62,874	226,492,642	3,602	69.27
Services & Misc. (Incl. Agri.)	32,160	106,928,916	3,325	63.94	35,590	125,328,251	3,521	67.71
Totals and Averages	177,437	\$749,004,333	\$4,221	\$81.17	194,101	\$839,893,117	4,327	83.21

* This number includes all covered employees on payroll, and is not restricted to production workers only, on which the average hourly and weekly earnings are reported.

** Smelting employment has been segregated from Manufacturing as reported by the Employment Security Commission.

Note: Fringe benefits are not included in the total wages.

TABLE VI

ARIZONA COPPER MINING - OUTPUT IN TONS COPPER ORE, VALUE OF COPPER, GOLD & SILVER PRODUCED

Source: U. S. Bureau of Mines

	Tons Copper Ore Annual Rate	Gold Ounces & Value	Silver Ounces & Value	Copper Pounds & Value	Lbs.Cu.Recov. Per Ton & Copper Price	Value of Copper, Gold & Silver	Lbs.Copper Equiv. to Total Val. Cu.Gold & Silver
1947-1949	38,082,754	79,612 \$2,786,420	2,603,485 \$2,356,154	723,353,767 \$150,588,843	19.0 lbs./ton 20.818¢	\$155,731,417	748,061,370
1950	41,757,037	79,562 \$2,784,670	2,853,375 \$2,582,304	765,334,514 \$159,189,578	18.3 lbs./ton 20.8 ¢	\$164,556,552	791,137,270
1951	42,784,388	83,521 \$2,929,220	3,087,865 \$2,794,518	775,609,514 \$187,697,502	18.1 lbs./ton 24.2 ¢	\$193,415,255	799,236,600
1952	44,472,522	83,692 \$2,929,220	2,900,851 \$2,625,270	730,809,903 \$176,855,966	16.4 lbs./ton 24.2 ¢	\$182,410,486	753,762,340
1953	45,187,838	89,724 \$3,140,340	3,164,255 \$2,863,809	738,404,453 \$211,922,077	16.3 lbs./ton 28.7 ¢	\$217,926,226	759,324,830
1954	43,072,894	94,648 \$3,312,680	3,380,060 \$3,058,954	714,154,795 \$212,103,976	16.6 lbs./ton 29.7 ¢	\$218,475,610	735,608,120
1955	52,189,728	105,330 \$3,686,550	3,629,191 \$3,284,418	856,270,850 \$321,101,569	16.4 lbs./ton 37.5 ¢	\$328,072,537	874,860,100
1956	60,468,580	119,435 \$4,180,225	3,963,579 \$3,587,039	935,039,400 \$390,846,469	15.5 lbs./ton 41.8 ¢	\$398,613,733	953,621,100
1957 <u>Est.</u>	60,700,000	123,000 \$4,305,000	4,100,000 \$3,710,500	1,020,000,000 \$301,920,000	16.8 lbs./ton 29.6 ¢	\$309,935,500	1,047,078,000

TABLE VII

ARIZONA COPPER MINING & SMELTING COVERED EMPLOYMENT: NO. OF EMPLOYEES*,

WAGES, MAN-HOURS, PERCENT INCREASE IN ACTUAL ANNUAL WAGES

Source: Arizona Employment Security Commission

* This number includes all covered employees on payroll, and is not restricted to production workers only, on which the average Hourly and Weekly Earnings are reported monthly.

	Average Number of Employees	Total Annual Wages	Average Hourly Earnings	Total Man- Hours	Avg. Annual Wage Rec'd By Each Employee	% Increase
1947-1949	12,778	\$44,607,006	\$1.430	31,198,740	\$3,491	-----
1950	11,681	48,144,321	1.627	29,509,000	4,122	18.08
1951	12,354	54,940,898	1.738	31,611,560	4,447	27.38
1952	12,965	62,590,235	1.917	32,655,928	4,828	38.30
1953	13,768	70,823,082	2.047	34,598,365	5,144	47.35
1954	14,202	73,877,753	2.127	34,736,370	5,202	49.01
1955	13,999	79,677,263	2.217	35,945,250	5,692	63.05
1956	15,758	93,657,256	2.363	39,639,019	5,943	70.24
1957	16,554	95,877,376	2.425	39,537,063	5,792	65.91

TABLE VIII

PERCENT INCREASE IN OUTPUT PER MAN-HOUR OVER BASE PERIOD 1947-1949

ARIZONA COPPER MINING & SMELTING

	Tons Copper Ore Per Man-Hour	Total Metal Value Produced Per Man-Hour	Total Lbs. Copper (Incl. Gold-Silver Equiv.) Produced Per Man-Hour
	% Increase	% Increase	% Increase
1947-1949	1.221	\$4.992	23.98
1950	1.415	5.576	26.81
1951	1.353	6.119	25.28
1952	1.362	5.586	23.08
1953	1.306	6.299	21.95
1954	1.240	6.290	21.18
1955	1.452	9.127	24.34
1956	1.525	10.056	24.06
1957	1.535	7.839	26.48

TABLE IX

ESTIMATED EMPLOYMENT, WEEKLY HOURS, HOURLY & WEEKLY
EARNINGS, IN ARIZONA COPPER MINING

Source: Arizona Employment Security Commission

These estimates are based upon a sample of full and part time production and related employees whose payroll and hours are reported for the pay-period nearest the 15th of each month. The base hourly rate is obtained by dividing the weekly earnings by the weekly hours plus one-half the overtime hours over 40 hours per week.

<u>Period</u>	<u>Employment</u>	<u>Weekly Hours 1/</u>	<u>Hourly Earnings 2/</u>	<u>Weekly Earnings</u>	<u>Base Hourly Rate</u>	<u>% Increase</u>
1947-1949 (Base Period)	10,700	44.83	1.432	64.20	1.359	-----
1950	9,500	46.5	1.63	75.80	1.524	12.14
1951	10,100	47.7	1.74	83.00	1.610	18.47
1952	10,700	47.1	1.92	90.43	1.777	30.76
1953	11,400	46.7	2.05	95.73	1.913	40.77
1954	11,600	45.3	2.13	96.60	2.015	48.27
1955	11,700	47.0	2.23	104.90	2.077	52.83
1956	13,300	47.1	2.38	112.07	2.213	62.84
1957	14,000 3/	43.8	2.42	106.22	2.324	71.01
1958 (March)	13,700	40.5	2.36	95.58	2.345	72.55

1/ Actual hours worked.

2/ Includes overtime earnings.

3/ Increase due to: San Manuel reaching economical capacity production.
Inspiration's new concentrator, and
Duval's new development.

Arizona Employment Security Commission's report of lay-off rate per month during 1957 in copper mining was 0.36% per 100 employees. 0.36% of 15,900 copper mining and smelting employees = 57.2 per month = 686 per year. Announcement of lay-offs at Miami and Ray in March, 1958, brings the total to 1,200 employee's laid off due to curtailment.