

BRIEF REVIEW OF OPERATIONS AT THE GREAT FALLS PLANT
AND AT THE SLAG TREATING PLANT, EAST HELENA, FOR THE YEAR 1949

For convenience, this report has been divided into the following parts:

1. Copper Refineries
2. Zinc Plant
3. Rolling Mills (Anaconda Wire and Cable Company)
4. Ferromanganese Plant
5. General
6. Expenditures
7. Slag Treating Plant, East Helena

1. COPPER REFINERIES

The Electrolytic Copper Refinery operated at an average rate of 40.2% of capacity, and an average current density of 11.36 amperes per square foot, producing 129,875,464 pounds of cathodes. There were 200,396 pounds of cathodes shipped during the year.

In addition to the cathodes produced from our own Electrolytic Copper Refinery, we received and treated in our Furnace Refinery 13,277,944 pounds of cathodes from Inspiration, Arizona.

The Anode Casting Plant operated 174 furnace days in 1949, producing a total of 37,579,231 pounds of copper anodes, of which 26,457,956 pounds came from anode scrap and miscellaneous copper scrap, 10,032,464 pounds from Miami blister copper and 1,108,811 from Kennecott blister copper. The No. 1 furnace in the Furnace Refinery Department did not operate in anode production during 1949.

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The remelting of anode scrap and blister copper for casting into anodes was transferred from the old anode casting plant to the No. 1 furnace in the Furnace Refinery Department January 3, 1950. The anode casting plant is being converted into a plant for the production of copper billets. The No. 1 furnace in the Furnace Refinery Department was equipped for casting anodes in early 1948 but has not been operated since March 18, 1948, when the plant was shut down because of lack of sufficient copper to justify the operation of a large furnace.

The Furnace Refinery operated 361 days during the year, at an average rate of 41.1% capacity, producing 143,163,531 pounds of shapes. A total of 130,933,395 pounds of refined copper was shipped during the year.

Insufficient cathodes were available to maintain a one-furnace operation on a five-day-per-week basis in July, August and September, with the result that the Furnace Refinery Department was shut down from July 9 to July 24, inclusive, and from August 19 to September 7, inclusive.

The Scalping Plant operated 242 days in 1949, producing 24,503,236 pounds of scalped wirebar. Shavings amounted to 2,666,376 pounds, or 9.34% of wirebar scalped, which was retreated through the Furnace Refinery. 5,513,031 pounds of scalped wirebar was delivered to the rolling mills at Great Falls, and 13,551,321 pounds was shipped to the American Brass Company during the year, including 2,852 pounds of silver. A total of 14,101,215 pounds of silver-bearing copper, containing

70,818 troy ounces of silver, was produced for the American Brass Company. 74,771 troy ounces of silver was used for this production, giving a loss of 3,953 ounces for the year.

Arrangements were completed with Kennecott Copper Corporation in December, 1949 for the refining of approximately 5,000,000 pounds of Garfield, Utah blister copper per month at Great Falls. Shipments were begun on short notice and arrived before we were able to fully equip our plant for sampling and moisture determination. We succeeded in securing a secondhand drill for sampling and we adapted one of our sample grinding mills to this use so that we were able to keep up with the handling of receipts of this material.

The distribution of copper shipped during the year was as follows:

A.C.M. Copper

	<u>Pounds</u>	<u>Percent of Total</u>
American Brass Company (Cathodes)	200,396	0.15
American Brass Company (Shapes)	33,769,055	24.83
Essex Wire Corporation (Shapes)	247,578	0.18
A.C.M. Company (Electrode Holders)	34,054	0.03
A.C.M. Company (Wires)	96,868	0.07
Great Falls Rolling Mills of Anaconda Wire & Cable Company	<u>101,635,941</u>	<u>74.74</u>
Total	135,983,895	100.00

2. MINE PLANT

All units of the Mine Plant operated at full load throughout the year with the exception of reduction in power during the months of July, August and September because of atmospheric temperature.

The total production of zinc cathodes for the year was 337,800,841 pounds, of which 9,271,410 pounds came from the retreatment of zinc plant dross. 2,123,969 pounds of cathodes was produced from zinc oxide recovered from zinc casting plant bag-house. 20,409,809 pounds of zinc, as zinc dust, was returned to the Zinc Leaching Department for solution purification. 3,343,784 pounds of zinc dust was returned to the Purification Residue Plant for solution purification, and 1,223,681 pounds of zinc dust was used in the retreatment of purification residue for the recovery of cadmium.

The Casting Plant treated 337,695,672 pounds of Great Falls cathodes, producing slabs in an amount of 291,530,936 pounds. No Anaconda cathodes were treated. The Casting Plant also produced 24,932,273 pounds of zinc dust and 24,676,814 pounds of zinc dross (including baghouse zinc oxide) containing 20,139,387 pounds of zinc. 3,317,889 pounds of zinc in dross was sold to other companies. Of the cathodes treated at the Casting Plant, 33,343,219 pounds was Company zinc, and 242,352,453 pounds was toll zinc. From Company cathodes was produced 82,241,258 pounds of slabs, and from toll cathodes was produced 209,289,678 pounds of slabs.

The net production of 291,530,936 pounds of slabs was cast as follows:

<u>A.C.M. COMPANY</u>	<u>POUNDS</u>
Slabs - Anaconda Electric	-
Slabs - High Grade	23,765,761
Slabs - High Grade (U.S. Treasury Dept. B.F.S.)	25,684,466
Slabs - Intermediate No. 1	22,715,995
Slabs - Anaconda S.C. No. 1	10,075,036
Slabs - Brass Special	-
Total Company	82,241,258

TOLL

Slabs - Special Zinc	599,893
Slabs - Prime Western Interlocking	1,284,126
Slabs - High Grade (Special Zinc)	1,399,836
Slabs - High Grade	165,721,666
Slabs - High Grade (Purchased by Anaconda)	-
Slabs - High Grade (B.S.)	363,089
Slabs - Special Intermediate No. 1	2,515,495
Slabs - Intermediate	799,715
Slabs - Intermediate No. 1	799,832
Slabs - Special Zinc Alloy	-
Slabs - Prime Western	28,583,216
Slabs - Special Intermediate	800,000
Slabs - Brass Special	200,000
Slabs - Special Zinc Alloy	1,784,159
Slabs - Special Zinc Alloy - G.D.B.	<u>4,498,651</u>

Total Toll 209,289,678

Total Net Production 291,530,936

The zinc shipments from the Great Falls Plant, for account of Anaconda Company, for the year were distributed as follows:

	<u>Tons</u>	<u>Percent</u>
American Brass Plants (inc. option)	454	1.11
Others	<u>40,577</u>	<u>98.89</u>
Total	41,031	100.00

The Zinc Plant produced during the year a total of 94,034.80 tons of residues for shipment, which contained 28,126,696 pounds of lead, 7,869,414 pounds of copper, 3,815,903.05 ounces of silver, and 11,729.744 ounces of gold. Included in this figure are 84,398.85 tons of regular zinc plant residue, and 9,636.15 tons of purification copper residue shipped to Anaconda. The 9,636.15 tons of purification copper residue is the result of treating purification residue from both Anaconda and Great Falls Zinc Plants. 8.47 tons of East Helena Slag Treatment Plant baghouse lime was sold locally during the year.

A total of 20,658 tons of lead bullion, resulting from Great Falls and Anaconda Residue and Anaconda lead concentrate, was shipped to American Smelting and Refining Company at Omaha, Nebraska, for refining and with return of refined lead to Anaconda Sales Company.

The Cadmium Plant produced 1,836,604.70 pounds of metallic cadmium during 1949, of which 1,221,064.70 pounds was Company cadmium and 642,540.00 pounds toll cadmium. A total of 2,101,186.46 pounds, including that alloyed in de-based zinc, was shipped during the year, of which 1,237,606.70 was for the Company and 863,580.76 pounds was toll cadmium. On January 1, 1950 there was on hand at the Great Falls Plant a total of 31,778.67 pounds of finished cadmium, of which 26,000.00 was Company cadmium and 26,778.67 pounds, toll cadmium.

6,100.69 tons of purchased concentrate, 141,072.22 tons of toll concentrate, 33,538.89 tons of baghouse fume from the Slag Treatment Plant at East Helena, 501.52 tons of International Smelting and Refining Company cadmium-bearing fume from Tooele, and 37,664.00 tons of zinc concentrate from Anaconda, was treated in the roasters during the year. The following toll concentrates were treated:

<u>TOLL ZINC CONCENTRATES TREATED</u>	<u>DRY TONS</u>
American Zinc Company (incl. Fresnillo)	11,595.42
Federal Mining & Smelting Company	3,990.62
International Minerals & Metals Corp.	53,563.86
Combined Metals Reduction Company	54,346.10
U.S. Smelting Refining & Mining Co.	2,810.54
Philipp Brothers, Inc.	5,504.81
U.S. Treasury Dept., Bureau of Federal Supply	526.11
U.S.A., Bureau of Federal Supply	<u>12,734.96</u>
Total	145,072.22

The calcine produced from these concentrates and fume, together with 54,916.98 tons of calcine, and 10,595.51 tons of purification residue from Anaconda was treated in the Leaching Plant.

22,509.35 ounces of indium was transferred from in process during 1949. We had on hand at Great Falls 30,323.52 troy ounces of indium on January 1, 1949. There was also 1,000.28 troy ounces at New York and 500.14 troy ounces at Perth Amboy. The sales of indium for the year totaled 43,013.08 troy ounces. The total inventory as of January 1, 1950, was 26,323.21 troy ounces, of which 25,322.93 was at Great Falls.

3. ROLLING MILLS DEPARTMENT (ANACONDA WIRE AND CABLE COMPANY)

The No. 1 Rod Mill operated 225 shifts and No. 2 Rod Mill operated 15 shifts during 1949.

The net rod production for the No. 1 Mill for the year was 108,802,043 pounds, and the gross production (including scrap and scale) was 108,064,008 pounds. The net rod production for the No. 2 Mill was 3,130,075 pounds, and the gross production was 3,232,194 pounds.

A new record production of 3/8" rods was established on December 18, 1949 with 1,610 bars rolled for a total weight of 302,456 pounds, which was a new record both for number of bars and weight rolled in an eight-hour shift.

The production of wire, including wire made into strand, was 9,408,070 pounds. There was also produced during the year 232,556 pounds of drawn rods, and 19,738 pounds of twisted flat wire, making a total wire and drawn rod production of 9,453,444 pounds. The strand production was 8,949,008 pounds.

We produced 80,812,950 pounds of ox-oil rods in 1949 as compared with a production of 49,049,435 pounds in 1948.

4. FERROMANGANESE PLANT

Ferromanganese production at Great Falls was discontinued with the midnight shift July 31, 1949 and the furnace remained down until November 28, 1949, when operations were resumed.

During the year 1949 the Ferromanganese Plant produced 4,647.542 long dry tons of ferromanganese, assaying 80.35% manganese. Shipments amounted to 4,643.248 long dry tons.

In the month of December we produced 567.18 long tons of ferromanganese, which is a record high production for any one month of operation of the furnace at Great Falls.

5. GENERAL

The annual report of Mrs. Dahl, our Industrial Nurse, shows that during the year she made 364 house calls, 251 calls to hospitals, and averaged 3½ hours per day in the North Montana Clinic Office, caring for 641 patients and holding 254 baby clinics. In the homes she cared for a total of 547 patients; 136 men, 209 women, 130 pre-school children and 72 school children.

Membership in the A.C.M. Club January 1, 1949 was 319 and on December 31, 1949 it was 378. The golf course officially opened June 5, 1949. Members of the Meadow Lark Country Club were permitted to play on the course while rebuilding of their course was being completed. Liberal guest privileges were also extended to personnel at the East Base of the U.S. Air Force.

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Arrangements were made for the A.C.M. Bowling League to bowl at Little's Lanes, alleys in the city of Great Falls, and two shifts, on eight alleys, bowled on two nights a week. Forty teams participated in regular weekly schedule. A Plant tournament was held at the close of the season, in which 31 teams took part. The games bowled during the season totaled 16,395. Twenty-two teams participated in the A.C.M. bowling tournament held in Butte.

Construction of a new clubhouse for Great Falls employees was begun during the year and foundation work was completed and brick work was begun, but delivery of steel was delayed by reason of the steel strike, so that only a limited amount of brick work could be erected. All of the building and roofing steel was delivered in January and February, 1950, so that construction can now go ahead without further interruption.

The total maturity value of bonds purchased by employees of the Great Falls Reduction Department from January 1, 1942 to January 1, 1950, amounted to \$2,923,680.00 and the total maturity value of bonds purchased by Great Falls employees of the Anaconda Wire and Cable Company amounted to \$234,675.00 for the same period, giving a total of \$3,158,355.00 in bonds purchased through Company facilities by the Great Falls employees. The total maturity value of bonds purchased by employees at the East Helena Slag Treatment Plant during the same period amounted to \$117,325.00. A total of \$143,999.64 was subscribed in savings bonds during 1949 with 20.67% of the employees participating and amounting to 2.44% of the total payroll.

There were 44% of this group scheduled to work on a six-day-per-week basis. During the summer months the employment of high school and college boys reduced our six-day-per-week employees to 12%. By the middle of October we had been able to make further reductions, so that the group of 6-day-per-week employees among the C.I.O. amounted to only 2%. Of the A. F. of L. employees (craftsmen) 90% were working on a six-day-per-week basis in mid-July. By October this figure had been reduced to 15% and at the year's end only 4% were working on a six-day-per-week basis.

During the year 1949 we hired 1,811 employees and had 1,829 separations, leaving a net loss of 18 employees.

Negotiations with the Unions for new contracts were held during the summer months and resulted in new contracts expiring June 30, 1950, with no increase in wages over those in effect July 1, 1949.

6. EXPENDITURES AGAINST APPROPRIATIONS

Construction of the A.C.M. Clubhouse was 28% completed at an expenditure of \$64,041.70.

Building and equipping of the new Cadmium Casting Plant was completed with an expenditure of \$33,790.00.

One Buffalo No. 1/2 x 12" Throat Universal Iron Worker with motor drive was installed on a concrete foundation at a cost of \$3,111.08.

One Yale and Towne 441-5M Fork Truck, 6000 pounds capacity, with Edison battery of 30 D6 cells was purchased at a cost of \$7,970.12.

One double cascade of 12 electrolytic cells was constructed at the east end of the Zinc Plant tank room at an expenditure of \$14,379.95.

Conversion of the present anode casting plant into a copper billet plant was begun, with an expenditure of \$21,709.20.

Installation of new electric hoists for stripping operations on one unit in the Zinc Plant tank room was 93% completed with an expenditure of \$31,216.95.

A one-unit extension to the Zinc Plant was authorized but construction was postponed indefinitely, awaiting improvement in metal markets. A total of \$441.80 was expended on this item.

Installation of spare rotors for the booster generator sets at the Zinc Plant substation was begun, but with no expenditure by December 31, 1949.

One Baker Model JOMH 40-48 4000-pounds capacity, industrial truck with H-36 ready power unit was purchased at an expenditure of \$6,599.95.

Construction and installation of two 18' diameter x 14' leach tanks for cadmium sponge at the Purification Residue Plant were completed at a cost of \$11,139.75.

Installation of a hammer mill for oversize calcine and a conveyor from the McDougal Roasters to the calcine screen was begun, with an expenditure of \$248.19.

Installation of a 30-pound air compressor in connection with installation of equipment for separate leaching of East Helena lumps was 77% completed, with an expenditure of \$13,100.57.

An extension to the Zinc Plant change house was 89% completed, with an expenditure of \$13,100.57.

Installation of equipment for separate leaching of East Helena lime was 40% completed, with an expenditure of \$51,485.05.

Purchase and installation of a magnetic, reduced voltage starter for a 150 H.P. motor were completed at the East Helena Slag Treatment Plant at a cost of \$1,208.07.

Installation of a secondhand pulverizer and fan in the Coal Pulverizing Department of the East Helena Slag Treatment Plant was completed at a cost of \$11,018.21.

Installation of automatic bag shakers and a one-bay extension to the bag house was 81% completed, with an expenditure of \$39,045.50.

One Joy Manufacturing Company 15 H.P., double drum electric hoist, Type AAP-212, was purchased and installed at the East Helena Slag Treatment Plant at a cost of \$1,621.00.

Installation of a Roto-Clone dust separator at the coal drier in the East Helena Slag Treatment Plant was 84% completed at a cost of \$3,433.45.

The following appropriations and expenditures were made at the Rolling Mills Departments:

Purchase and installation of one Morgan Mono-block wire machine was 100% completed at a cost of \$17,834.

Purchase and installation of one exhaust fan and

motor was 100% completed at a cost of \$801.78.

Construction of an extension to the pump house and installation of spare 8" centrifugal pump was 100% completed at a cost of \$5,673.89.

Purchase of miscellaneous office furniture and equipment was completed at a cost of \$1,648.58.

Construction of an extension to the steel platform in the mill building was 100% completed at a cost of \$1,574.29.

Construction of improvements in the ventilating system at the billet furnace was 100% completed at a cost of \$1,453.15.

Purchase of one Quonset 40 building to be used for a reel repair shed was 100% completed at a cost of \$17,900.79.

Purchase of one Quonset 24 building to be used for a reel paint shop was 100% completed at a cost of \$8,600.04.

Construction of a garage for shift foreman was 100% completed at a cost of \$895.16.

Construction of a steel platform for electrical equipment was 100% completed at a cost of \$1,057.65.

Purchase and installation of equipment to provide a standby oil burner on the billet heating furnace was 100% completed at a cost of \$8,141.44.

Purchase and installation of reversing control for #1 strand was 100% completed at a cost of \$1,069.45.

Purchase and installation of 15 industrial control units was 100% completed at a cost of \$754.65.

Enlargement of the inspection laboratory was 100% completed at a cost of \$2,251.09.

Purchase and installation of push button control for the flat mill was 100% completed at a cost of \$2,380.

Purchase and installation of one Worthington 3-DE-8 Monobloc pump and motor was 100% completed at a cost of \$486.63.

Purchase and installation of one 10% Tilting Arbor circular saw was 100% completed at a cost of \$356.44.

An appropriation of \$1,729.00 for one combustion air fan for the billet furnace was approved but none of this money was expended in 1949.

7. SLAG TREATING PLANT - EAST HELENA

There was treated during the year 208,735.46 tons of molten slag and skulls, assaying 13.701% zinc, and 14,146.92 tons of cold slag from the dump, assaying 12.370% zinc, making a total of 222,882.38 tons, assaying 13.616% zinc.

The production resulting was 36,827.06 dry tons of fume assaying 69.342% zinc, showing a recovery of 84.145% of zinc content of slag treated.

33,574.96 tons of fume was shipped to Great Falls for treatment in the Zinc Plant; 21.25 dry tons was sold locally, 606.02 tons was shipped to the American Chemet Corporation, 1,282.93 tons was shipped to Eagle Picher Lead Company, and 1,095.18 tons was shipped to the Ozark Smelting and Mining Company.

The Slag Treating Plant operated continuously throughout the year except for a few interruptions when the plant was shut down for flue cleaning and necessary repairs.

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