

ANACONDA COPPER MINING COMPANY

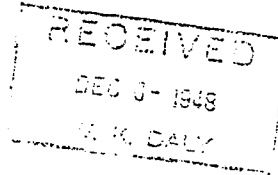
DRAWER 1961

K. B. FRAZER
Assistant Secretary
and
Assistant Treasurer



BUTTE, MONTANA

December 2, 1948



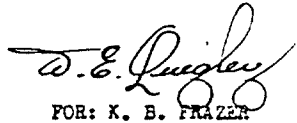
Mr. E. S. McGlone, Vice President
Anacoda Copper Mining Company
Hennessy Building
Butte, Montana

Dear Sir:

Herewith, copy of report of Mr. E. C. Jacobson, Metallurgical Auditor, covering audit of metallurgical operations of the International Smelting and Refining Company - Tooele Plant for the month of July 1948.

Copies of my letters to Mr. W. K. Daly, Comptroller, and Mr. Rom Warburton, Cashier, are also enclosed.

Yours very truly,


FOR: K. B. FRAZER

WJF/EK
Enc.
cc - Mr. W. K. Daly

PNYC 00012239

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ANACONDA COPPER MINING COMPANY

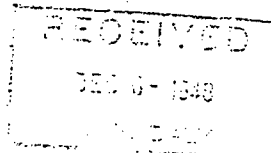
DRAWER 1961

K. B. FRAZER
Assistant Secretary
and
Assistant Treasurer



December 2, 1948
BUTTE, MONTANA

Mr. Ros Warburton, Cashier
International Smelting and Refining Company
321 Kearns Building
Salt Lake City 10, Utah



Dear Sir:

Herewith, three copies of report of Mr. E. C. Jacobsen, Metallurgical Auditor, covering audit of metallurgical operations of the International Smelting and Refining Company - Tooele Plant for the month of July 1948. One copy is intended for your files and one is for Mr. Floyd. You may wish to give the third copy to Mr. Sardlaw or some other interested party.

This report, being the first to cover these operations, is written up in complete detail and as a result of sectional presentation involves some duplication. Pertinent matters are summarized on pages 33 to 40, and to facilitate your review the subjects which may involve further consideration are set forth below:

Page 7 and 34 - Sale of Reverberatory Furnace Bottoms to American Smelting and Refining Company:

Under letter agreement covering the above sales, payments for silver and copper are made on quotations for the week 120 days forward from the date of arrival of material at Tacoma. During this interval, the material is continued in the inventory at Tooele as though shipment had not been made and only after final settlement is the inventory reduced by proper weight and metal content. In addition, the letter agreement does not provide for definitely defined splitting limits.

In view of the agreement involved, it appears the accounting is reasonable for the market may fluctuate considerably in the 120-day period and the selling price is not known until the period has elapsed. The agreement, however, is somewhat unusual and although we assume the terms result primarily from the nature of the material, it being understood that the material is somewhat hard to dispose of for only small quantities can be treated at one time by reason of the impurities, we would like to verify this assumption or ascertain the real reason for the 120-day period and the lack of definite splitting limits.

Page 10 - Ore at Stock Pile:

Inventory of lead and copper ores in stock pile and bins was valued on a life basis starting April 30, 1948. Value per pound of lead in ore in stock pile at the audit date (July 31, 1948) was only 10.353 cents which would indicate an even lower price at April 30, 1948. Since the market price of lead for April ranged between 13 and 17.5 cents a pound it would appear that even after allowance for freight and refining a cost in excess of 14 cents should result; consequently, we are wondering at what date the pound price of lead ore in stock pile was established.

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Page 11 - Ore in Process:

From the last paragraph it appears that material cost of lead in process at July 31, 1943 was 17.553 cents a pound, which is the price at which it was transferred from stock pile and bins. Transfer price of 17.353 cents is in order since that is the price of the July receipts and there is an increment in the inventory at July 31, but, if our assumption that material cost of lead in process is valued at 17.553 cents a pound, then the cost of lead in process exceeds its raw ore equivalent by 5.323 cents a pound (17.553 cents minus 11.73 cents). Possibly the material cost of lead in process is not valued on a life basis, but it would appear that it should be if we are to be consistent with practice followed in valuing raw ore and, also, our practice in applying reduction costs, which are far below current costs, to the in-process inventory.

Page 30 - Ores from Park Utah Consolidated Mines Company:

Ore sold to the International Smelting and Refining Company by the Park Utah Consolidated Mines Company is sampled by the Utah Ore Sampling Company, a public sampler. The Sampling Company, in addition to sampling, weighs cars gross and tare and obtains the moisture per cent. The moisture content is accepted by International as are the weights; however, check weights are made by International.

It is our understanding that the Sampling Company provides both International and Park Utah with the sample pulp from which assays of metal contents are made. No independent sample being taken by International as a check on the Sampling Company probably because of the additional expense involved.

If our understanding is correct, it appears that there is a chance of errors in sampling going undetected with resultant error in metal content on which settlement is based, since both buyer and seller are provided with pulp for assay from the same source.

Page 33 - Base Bullion Rate for Determining Lead and Copper Payments
on Park Utah Consolidated Mines Company Contract:

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Contract provides that any increases or decreases in the lead and copper bullion rates shall be for the account of the shipper. On April 20, 1935, the bullion rate was increased from \$12.50 to \$13.00 per ton. The contract of October 31, 1935 specified the \$13.00 bullion rate. However, all settlements are calculated using the old \$12.50 rate as a base. No explanation could be given regarding the use of the lower rate. Its use results in reduced payment to the shipper of .025 cents per pound of lead or copper paid for. Mr. G. A. Burt, Ore Buyer, expressed the opinion that, in view of the small amount involved and the long period of time over which the \$12.50 rate was used, no adjustments or corrections be made and use of the \$12.50 rate be continued. You may wish to discuss this matter further with Mr. Burt.

Page 35 and 36 - Repeat Assays on Combined Metals Reduction Company:

Page 36 - Limits of Variation of Assays - Combined Metals Reduction Company:

On page 36 the Auditor indicates that he has discussed these matters with you and that you are to confer with the Management and advise the Auditing Department.

Page 37 - Valuation of Gold:

Total gold cost is divided by \$34.91 an ounce to arrive at ounces purchased in

order to show uniform price and simplify presentation in the statements. A slight variation in actual gold ounces purchased is caused by this practice, but the alternative is to list all gold ounces at their several respective purchase prices. If lots of gold purchased and prices paid are not too numerous it would seem that it would not be too much trouble to list them as they actually are, rather than follow the present practice.

Page 37 - Sampling Ore Cost:

Sampling costs are not included in cost of ore in stock piles at Lead Plant and Sulphide Concentrator presumably because when this ore is removed from the stock piles at a later date it is again sampled. There is some justification for this practice inasmuch as, if sampling costs were added at the stock pile and thus included in cost of stock pile ore going into process and this same ore was in the in-process inventory and cost of sampling again added, the inventory could be burdened with two sampling costs. However, it is recognized practice to charge purchased ores with sampling costs and to inventory such sampling costs.

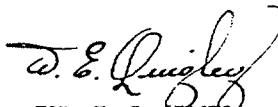
Page 40 - Consignment Stocks of Leaded Zinc Oxide:

Ninety thousand pounds of leaded zinc oxide were consigned to C. L. Duncan Company, Los Angeles, California in August 1947. Sales of 22,900 pounds were reported in November 1947, but none have been reported from December 1, 1947 to July 31, 1948. It is our understanding that this product does not have the ready sale that delead zinc fume does and possibly that accounts for the long lapse without a sale, but, if there is any doubt in your mind of the existence of this inventory and you think it advisable, our Auditor, who is now at the Anaconda Wire and Cable Company, Orange Mill, could go up to Los Angeles and take an inventory.

Your comments on the foregoing subjects and any others which you may have relative to the report would be appreciated.

If convenient, the next time a metallurgical statement is prepared will you please have a couple of extra copies made and forwarded to Butte for our files.

Yours very truly,


W. E. Quigley
FOR: K. B. FRAZER

WJP/EX

cc - Mr. S. S. McIlone
Mr. W. K. Daly
Pogson, Palenbret & Co.

PNYC 00012242

INTERNATIONAL SMELTING AND REFINING COMPANY

TOOELE PLANT - TOOELE, UTAH

JULY 1948

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INTERNATIONAL SMELTING AND REFINING COMPANY

TOOELE PLANT - TOOELE, UTAH

JULY 1948

SYNOPSIS OF PLANT OPERATION

The following synopsis has for its sources (1) a pamphlet entitled "International Smelting Company, Tooele Plant, Tooele, Utah," prepared for the members of the American Institute of Mining and Metallurgical Engineers, September 1, 1925 (2) thesis of Mr. Paul H. Floyd, son of Mr. F. H. Floyd, Chief Clerk, written as part of requirements toward a Bachelor of Science degree in Metallurgical Engineering, and (3) paper by Mr. H. M. Rockwell, former Superintendent of Lead Plant, entitled "Tooele Slag Treatment and Deleading Plant." From observation of the plant and inquiries made by the auditor data has been revised to effect an up-to-date description of the plant.

The Tooele Plant of the International Smelting and Refining Company is located at International, Utah, the terminus of the Tooele Valley Railroad, five miles east of Tooele City and thirty-five miles southwest of Salt Lake City. It is a customs smelter and consists of (1) a lead-zinc flotation concentrator (2) lead smelter and (3) a slag treatment and deleading plant. A copper smelter dating from August 1910 discontinued operations during 1945. The lead smelter started operations in February, 1912; the lead-zinc selective flotation in November 1924, and the slag treatment plant in 1941.

All ores are sampled at the plant's sample mill for the purposes of ore settlement, and determination of the smelter treatment that is to follow, the only exception being those already sampled at the public sampler.

A major portion of the ore and concentrates is delivered to the plant by railroad, the only exception being a small amount of trucked lots. "Railroad" ore is weighed on a Fairbanks type "S" track scale and is then dumped into temporary storage bins to await sampling. These bins are designated alphabetically from "A" to "S", inclusive. Total capacity of these bins is approximately 3,000 tons, capacity of bins varying from 100 to 450 tons. The lead-zinc ores are received mainly from Park City and Bingham, Utah, and from Colorado, Nevada and Idaho. Lead ores are received mainly from Timbuc, Park City and Bingham, Utah and from Idaho and Nevada. The ore is conveyed to the sampling mill from the receiving bins by conveyor belts, crushed, mixed and a representative portion automatically separated as a sample of the lot. After sampling, the ores are distributed by belt conveyors and railroad cars to Lead Plant bins or Lead-Zinc Plant bins, all in the smelter yards. The lead ore is shipped by belt conveyor or cars to Lead Plant charge bins and the cars of lead-zinc ores are hauled to the concentrator and dumped into receiving pockets there.

SULPHIDE CONCENTRATOR

The concentrator was acquired from the Utah Consolidated Mining Company on April 1, 1924, at which time and up until November 1, 1924, it operated on copper ore from Bingham. Due to a poor copper market and due to experimental and research work done on concentration of lead-zinc-silver ores of the district, the plant was remodelled and operations were started as a custom lead-zinc concentrator on November 1, 1924, with a capacity of 500 tons per day. A second unit of 250 tons per day capacity was put in operation February 4th, 1925, which was increased to 500 tons per day on May 1, 1925, since which time the concentrator consists of two units, each of which may handle 500 tons per day of lead-zinc ore.

Briefly, the operation consists of crushing and sampling the ore as above described, and to a considerable extent bedding the different ores prior to sending them to the concentrator in order to maintain as uniform a feed as possible. Standard practice of ball mill grinding and classification is followed, and then with different reagent additions, series recovery of the lead, zinc and iron is made in respective concentrates by flotation alone, as well as a final or mill tailing which goes to waste. The concentrator is arranged in two separate and distinct sections, both identical in the grinding circuit, but differing in the flotation circuit. The ores are treated in the section or combination of sections in which it has been found the equipment is best adapted as regards metallurgical results. The lead concentrate is sent to the Tooele Lead Plant, the zinc concentrate to the Anaconda Copper Mining Company Plants at Anaconda and Great Falls, Montana, and the iron concentrates to the Tooele Lead Plant for fluxing purposes. The tailings are discarded.

Assays of feed and products are about as follows:

Feed - Lead	6 to 15%
- Iron	8 to 10%
- Zinc	10 to 12%
Lead Concentrates - Lead	55 to 60%
Zinc Concentrates - Zinc	50 to 55%
Iron Concentrates - Iron	38 to 40%

This concentrator is especially unique in that it is treating a varying mixture of lead-zinc ores from many mines on a strictly custom basis, and making a three mineral separation and concentration from them by flotation alone.

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SYNOPSIS OF PLANT OPERATIONS

LEAD SINTER

Lead ores are received by belt conveyor and railroad cars from the sampling mill and are delivered to steel charge bins having a capacity of 13,000 tons. These bins are divided into two sections, one of which contains the materials for making up the sintering plant charge and the other the ores, fluxes, coke and sinter used in making up the blast furnace charge.

Practically all of the fine material treated at the lead plant, such as concentrates, fine dust, etc., requires sintering to agglomerate it before including it in the charge for the blast furnace. There are 22 sintering plant charge bins each having a capacity of 120 tons of ore or 240 tons of concentrates. Directly below these bins is the charge floor. The various materials for the charge for the sintering plant are drawn from the bins by mechanical feeders adjusted to deliver the desired portion of each to a belt conveyor which discharges them to a mixing device. From this they fall on an inclined conveyor belt leading to the feed floor of the sintering plant where the charge is distributed to the five-ton feed hopper above each machine.

There are ten standard Dwight-Lloyd sintering machines. The charge is mechanically spread in a thick layer on a traveling grate. The surface of the charge is ignited by natural gas burners in a fire box spreading the width of the grate. Ignition is maintained by the continuous drawing of air through the ignited bed by means of suction boxes connected to a Sirocco fan. Sulphur is about 12% in the charge and is roasted down to about 1.2% in the sinter. The material fuses slightly and forms a clinker-like mass which is discharged at the end of the machine and falls into railroad cars. These cars are hauled to the blast furnace bins and the sinter dumped therein to form part of the charge to the blast furnace. The gases from the sintering plant are passed through a moisture chamber and then to a Cottrell precipitation plant where much of the dust they contain is deposited. The Cottrell catches about 65% of total dust collected. The gases pass through a flue to a brick stack 18 feet in diameter and 200 feet in height. The Cottrell dust is returned to the Sinter Plant.

The Blast Furnace Plant consists of five lead blast furnaces 52" to 55" x 180" at the tuyere line. Each furnace has 25 tuyeres. The height from tuyere line to charge floor is 24 feet 8 inches. The capacity of each of these furnaces is about 350 tons, total charge per 24 hours including dump slag and retreated materials. At the present time only one furnace is in operation.

The charge cars have hopper bottoms with bottom hinged drop doors and are electrically operated. They are of the same length as the blast furnace. The bins from which the charge cars are loaded are north of the sintering plant charge bin section and are 30 in number, each having a capacity of 110 tons. Each set of 2 bins is equipped with a swing scale hopper having multiple beams for accurate weighing of the ingredients to the blast furnace charge. The constituent materials are dropped into the charge car, while in motion, thus bedding the charge in the car itself. The car is run over the furnace and the charge dropped therein. The charge consists of coke, sinter, dross, lime rock, siliceous ore and scrap iron.

The gases from the blast furnace are drawn off just below the charge floor and enter a cylindrical dust catcher, tangentially. These catchers are 20 feet in diameter and 18 feet in height. The gases are discharged from this catcher into a steel balloon flue 498 feet long, whence they are forced into the baghouse by a Sirocco fan with a capacity of 180,000 cubic feet per minute. This brick baghouse contains 1,460 cylindrical cloth bags 18 inches in diameter and 30 feet in length. The fume from the gas is shaken from the inside of the bags by reversal of the pressure on the bag, causing it to collapse. The fume falls into pits from which it is removed periodically, either being shipped to Great Falls for recovery of cadmium or returned to the blast furnace as part of a fresh charge. The filtered gases from the baghouse are discharged through a steel downtake to the same stack into which the sintering plant gases are received.

Slag and speiss are tapped from the blast furnace into large movable forehearth in which separation is made by gravity. The purpose of the forehearth is to allow the slag, speiss and small amounts of entrained metallic lead to settle into separate layers due to difference in specific gravity and immiscibility. The slag overflows from the forehearth into a second settler and from that into 7 ton slag pots which are taken to the Slag Treatment Plant. The speiss is tapped into pots, granulated, loaded into cars, stored in stock pile and periodically treated in the old McDougall Roasting furnace for removal of arsenic. The resulting calcine is returned to the sintering plant. The small amount of entrained metallic lead in the slag is tapped into a lead ladle and taken to the dressing plant.

Metallic lead is tapped from the blast furnace into three-cubic-foot conical pots and taken to the dressing plant where it is dumped into any one of four 60 ton dressing kettles. In these kettles the lead is agitated with compressed air introduced by means of a pipe into the bath. When a dross layer is formed an inch or so thick, it is skimmed off the top of the lead bath by means of a sieve ladle operated by a mono-rail crane. The ladle is set over an empty dross kettle and any molten lead is allowed to drain out. The dross in the ladle is then taken to the Dross Reverberatory Plant.

The mechanical dressing continues until there is little or no dross forming and reduces the copper content to .10 to .15 per cent. When the first dressing is complete the bullion is pumped into one of two 120 ton kettles for the Hulst process. In the 120 ton kettle the lead is agitated by impellers. The impellers are

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SYNOPSIS OF PLANT OPERATIONS

LEAD DRESSING (Continued)

rotated by a motor mounted on a platform that bridges the kettle, thus putting the impeller shaft in the center of the molten bath. The bullion is cooled to about 610° F. and sulphur is slowly dumped into the vortex created by the impellers. Thirty to forty minutes are taken in the addition of 250 pounds of sulphur. After the addition it takes about 20 to 40 minutes for the dross to form and separate from the molten lead. The separation is indicated when the dross becomes a black powder. The dross is skimmed in much the same fashion as the skimming of the first operation.

After the dressing operation a centrifugal pump is placed over the dressing kettle and the lead is pumped into tank cars for shipment to the American Smelting and Refining Company at Omaha, Nebraska, for refining.

The Dressing Refractory Plant receives the dross from the Dressing Plant and produces three products, matte, speiss and lead. The matte is sold to the American Smelting and Refining Company, the speiss is periodically treated at the Copper Converting Plant for recovery of copper and the molten lead is taken back to the Dressing Plant.

SLAG TREATMENT AND DRESSING PLANT

The Slag Treatment Plant began operation in September 1941. It has an average daily capacity of 362 tons and treats molten slag, cold slag, crude ore and zinc flue cleanings. Molten slag comes from the lead blast furnace. Cold slag is mined from the lead slag dump, in which there was, in 1939, an estimated 300,000 to 400,000 tons of slag that could be profitably treated. Zinc ore added is an oxide ore running about 18% zinc. Zinc cleanings come from the furnace downtake and combustion chamber. Charges to the fuming furnace are composed of 10 pots or from 40 to 50 tons of material. A charge varies from 10 pots of hot slag to 7 pots of hot slag and 3 pots of cold material. The hot slag is charged as soon as it is tapped from the blast furnace.

Construction of the plant was modeled after that of the Anaconda Copper Mining Company at East Helena, Montana. It consists of (1) a coal drying and pulverizing plant, (2) coal feeders, (3) furnace, (4) primary flue system, (5) baghouse fan, (6) baghouse and (7) dedusting kiln. A very brief description of each follows:

Slack coal is dumped into steel bins having about 100 tons capacity. It is dried in a Ruggles-Coles dryer and is fired with gas. The dried coal is discharged into a bucket elevator which elevates it to a 40-ton bin above the pulverizer. The pulverizing is done by a Raymond Mill which grinds 4.5 tons per hour. The coal is blown into a collector which delivers it to a 40-ton storage bin directly above the coal feeder tanks.

The five coal feeder tanks which have a capacity of about 3 tons each are connected to the 40-ton storage bin with 8 inch plug valves through which the feeder tanks are filled with coal. Screw feeders, which can be operated at variable speeds, are mounted on the hopper bottom of each tank and deliver the coal to an air injector. The air injector maintains a pressure about one pound higher than the back pressure from the furnace, and this pressure differential carries the coal from the screw feeder through the main feed pipes to the coal manifold at the furnace and thence to the burners.

The furnace is shaped like a large rectangular retort with water-jacketed sides, top and downtake. It is 8 feet wide, 10 feet long and 11 feet 4 inches high to the bottom of the charge spout, but is 24 feet high to the highest part of the water-jacketed top. The downtake, which conducts the furnace gases from the furnace into the flue system, is 8 feet wide, 8 feet high and 30 feet long and has a bridge jacket 4 inches high across the furnace connection to keep the slag from splashing into the downtake. The furnace, which was invented by Mr. Alexander Laist of the Anaconda Copper Mining Company Slag Treatment Plant at East Helena, Montana, are double-inlet type having a connection for both air and coal, and are water cooled.

The downtake connects the upper part of the furnace proper to the combustion chamber. The chamber is equipped with 102 sprays which can be used to cool the gases when necessary. A series of hinged doors on each side permit the dust to be scraped out with long handled hoes. A steel moisture chamber 48 feet long is connected to the brick combustion chamber by means of an expansion joint. The moisture chamber is hopper bottomed and is equipped with 48 sprays. Between the moisture chamber and U-tube cooling section is 215 feet of balloon flue having an area of about 114 sq. ft. All the dust from the balloon flue and moisture chamber is cleaned into trucks or mine cars and goes to the dedusting kiln as part of the secondary feed. The U-tube cooling section is 120 feet long and is made up of 16 U-tubes 55 feet high and 37 3/4 inches in diameter. By means of a center partition running lengthwise of this section and 3 dampers, the gas is made to pass up and over 8 tubes at a time. To keep the cooling effect of this section at maximum efficiency, the tubes are pounded with wooden mallets twice each shift on seven different levels, each tube being hit 10 to 15 times on each level. The dust falls into hoppers from where it is drawn into small cars and makes up part of the primary feed to the dedusting kiln.

The baghouse fan is located equi-distant from the outlet of the U-tubes and the inlet of the baghouse header flue. Volume of gas handled varies between 110,000 and 112,000 cu. ft. per minute under actual conditions.

There are two parallel baghouses, each having 294 woolen bags 18 inches in diameter and 50 feet long. The bags are shaken with mechanical shakers which raise and then drop the bag 1/2 inch each revolution. The bag or pit section of the building receives the dust which is removed by a pneumatic vacuum conveying system. The dust discharges into the dedusting storage bins above the kiln.

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SYNOPSIS OF PLANT OPERATIONS

SLAG TREATMENT AND LEAD-ING PLANT (Continued)

The delinting (rotary) kiln is 72 ft. 6 in. long and 7 feet in diameter and is fired with natural gas. The zinc oxide discharges from this kiln into a cooler. From the cooler it is conveyed to a vibrating screen in closed circuit with a small set of rolls. Screen undersize is carried by a conveyor belt to railroad cars for shipment to a zinc re-ort plant. The lead fume discharges into the combustion chamber of the secondary circuit. The combustion chamber discharges into a 122 foot balloon flue. This flue has a hopper at bottom for the removal of the fume into hand-trammed cars. This chamber terminates in a section of the U-tubes previously described. A separate vacuum system is used for this section, the fume being delivered to railroad cars for recirculation through the sintering plant or for shipment to consumers.

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INTERNATIONAL SMELTING AND REFINING COMPANY

TOOELE PLANT - TOOELE, UTAH

JULY 1948

COPPER PLANT

ACCOUNTING PROCEDURE FOR COPPER PLANT

Accounting records for the Copper Plant were designed to show as far as possible the cost of operations and the valuation of inventories. Ultimate determination of profit, under operating conditions was not available due to lack of information on final sale of finished metal. Estimates were, however, prepared and are yet prepared, although the plant has not been in operation since June 1945. Present estimates are in reality final when all sales are made in the West and actual revenues are available. The following comment will briefly review the accounting procedure as to (1) receipt and cost of materials, (2) shipments and sales of products and (3) inventories and their valuations.

(1) Receipt and Cost of Materials

Since cessation of operations in June 1945 no materials have been purchased for treatment. All original materials on hand have been disposed of.

(2) Shipments and Sales of Products

All present shipments are from by-product inventories. The products available for sale are reverberatory furnace bottoms, reverberatory flue dust, roaster furnace bottoms and roaster flue dust, the last two being designated as "McDougall" bottoms and dust. Sales have been made in the past to the Anaconda Copper Plant, the American Smelting and Refining Company at Tacoma, Washington, and the Tooele Lead Plant. Sales of furnace bottoms and flue dust to the Anaconda Copper Plant are by letter agreement. The Anaconda Plant has indicated that due to arsenic and other impurities in the material it cannot treat more than small quantities at one time. Otherwise the copper anodes would be too contaminated with deleterious elements. The sales to the American Smelting and Refining Company are also made on the basis of letter agreement. During July 1948 some reverberatory furnace bottoms were sold to that Company. Sales to the Tooele Lead Plant are made on a schedule prepared by the management and designed to yield a fair profit to each plant.

(3) Inventories and Their Valuation

The inventories remaining in the plant are designated as by-products. It is the metal content of these materials during a normal course of operation would be available in finished production only if reprocessed at additional cost, such content is not "worked back" to original material equivalents. The value of these materials is therefore based on an estimated sales value for actually on an "average normal" basis established years ago on a schedule basis. A brief resume of the schedule used to value the remaining inventories is as follows:

Metals paid for on all inventories:

Lead :	40% of content
Copper :	Content less 4 lbs., per ton and balance at 97%
Silver :	95% of content
Gold :	95% of content

Metal Prices and Treatment Charge:

	Lead Per lb.	Copper Per lb.	Silver Per Ounce	Gold Per Ounce	Treatment Cost Per Ton
Reverb Bottoms	2.00¢	10.078	34.75¢	34.00	\$11.0508
Roaster Bottoms	2.00	10.500	34.75	34.00	8.4948
Reverb Dust	2.955	10.500	34.75	34.00	4.9917
Roaster Dust	2.00	10.500	34.75	34.00	3.4570

The treatment costs per ton are based on impurities.

Based upon present or normal metal prices the above schedule would seem to be very conservative. Inventory during July 1948 was reduced by \$8,384.62 due to sale of by-products to the Lead Plant and to the American Smelting and Refining Company. Revenue from sales was \$30,247.39 which exceeded the value of the inventory as carried by \$11,862.77. Cost of reclaiming the inventories plus shut down expense of \$3,054.99 was \$4,081.10 leaving a profit of \$7,781.67. Present metal prices would necessarily have to drop considerably to convert sales of this material from a profit to a loss.

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COPPER PLANT

SHIPMENTS - COPPER PLANT

Reverberatory Fine Dust and Furnace Bottoms to Lead Plant

Actual weight and assays are obtained to determine metal content of fine dust and furnace bottoms shipped to the Lead Plant. The management has submitted a schedule for preparing settlement for material transferred. This schedule is based on the assumption that the material might be sold either to an outside company or to the Lead Plant at a price fair enough to yield a profit both to buyer and seller. The shipments during July 1948 were from inventories remaining after shut down.

Reverberatory Furnace Bottoms to American Smelting and Refining Company, Tacoma, Washington

Furnace bottoms shipped to the American Smelting and Refining Company at Tacoma, Washington, were also from inventory remaining after shut down. The terms under which the shipments are made are outlined in letter agreement dated June 19, 1947, written by Mr. R. C. Cole of the American Smelting and Refining Company to Mr. Glen Eurt, Ore Buyer for the International Smelting and Refining Company. A brief synopsis of the terms is as follows:

- Delivery - F.O.B., Tacoma, Washington
- Tonnage - 100 tons per month, nickel content not to exceed 5 tons per month.
- Duration - Terms subject to cancellation upon written notice.
- Payments:
 - Gold - If .03 ozs., per ton or over, pay for 98.75% @ \$34.9125 per ounce.
 - Silver - If 1 troy ounce or over, pay for 95% at Handy and Harman quotation for week 120 days forward from date of arrival at Tacoma. Minimum deduction .5 of an ounce.
 - Copper - Deduct 20 pounds and pay for balance at New York cathode price 120 days forward, less a deduction of 2.5¢ per pound.
- Deductions:
 - Treatment - \$10 per net dry ton.
 - Zinc - 7% free; charge for excess at 30¢ per unit.
 - Arsenic - 3% free; charge for excess at 25¢ per unit. Maximum penalty \$3.00 per ton. If 16% or over, no penalty.
 - Antimony - 1% free; charge for excess at 50¢ per unit.
 - Nickel and Bismuth - Charge \$2.00 per unit.

See also under "General Comments - Reverberatory Furnace Bottoms to American Smelting and Refining Company."

INVENTORIES - COPPER PLANT

Reverberatory Furnace Bottoms

The furnace bottom inventory at July 31, 1948, includes metal in furnaces Nos. 3 and 4. The current inventory is arrived at by reducing Testing Department estimates by known quantities shipped. The Testing Department estimates were made by measuring, sampling and assaying the bottoms. Data on these tests is as follows:

Furnace Number	Date Sampled	METAL CONTENT			
		Lead - Lbs.	Copper - Lbs.	Silver - Ounces	Gold - Ounces
3	10/28/43	325,296	811,914	38,440.00	2,242.000
4	3/6/29	79,704	307,869	21,560.00	550.000
		405,000	1,119,783	60,000.00	2,792.000
To the inventory as thus determined was added frozen matte in furnaces Nos. 3 and 4 as follows:					
		10,500	96,600	1,582.50	62.500
Grand total carried as bottoms at cessation of operations in June, 1945		415,500	1,216,383	61,582.50	2,854.500
Shipments of inventory during the ensuing shut down period reduced the inventory to the following content at July 31, 1948:					
		95,657	594,258	40,733.04	741.481
% to June 1945 Inventory		23.02%	48.85%	66.14%	26.68%

PNYC 00012249

COPPER PLANT

INVENTORIES - COPPER PLANT (Continued)

Reverberatory Furnace Bottoms (Continued)

Furnace Number	Date Sampled	METAL CONTENT			
		Lead - Lbs.	Copper - Lbs.	Silver - Ounces	Gold - Ounces

All removals to date have been made from furnace No. 3, the other furnaces remaining intact. The inventory on furnace No. 3 at July 31, 1948 was:

% to October 1943 Inventory	5,453 1.68%	189,739 23.58%	17,585.54 43.75%	148.981 6.65%
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Providing there is enough tonnage remaining to yield the remaining copper and silver content as per book inventory, it is apparent that the lead and gold inventories were quite conservatively estimated. This is substantiated by test taken on furnace No. 3 on April 22, 1946, ten months after shut down. The inventory was determined to be as follows:

595,027	1,276,478	46,850.00	4,417,000
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This inventory was not used due to instructions from Mr. E. O. Sowerwine to the effect that inventories established at time of shut down, except for subsequent removal adjustments, were to remain as such until final cleanup of all plant inventories. Excavation underneath the bottom of furnace No. 3 has yielded earth impregnated with veins of lead. Accuracy of the inventory is indeterminable until final cleanup is made.

Under the letter agreement for sale of furnace bottoms payments by the American Smelting and Refining Company for silver and copper are to be made on quotations for week 120 days forward from date of arrival of bottoms at Tacoma. Settlements are therefore delayed approximately 4 months from arrival of material. During this interval the material is carried in inventory at Tooele as though no shipment had been made. When final settlement is made, the inventory is then reduced by the proper weight and metal content.

Reverberatory Flue Dust

On August 30, 1943 and February 23, 1945 (about 3 months prior to shut down) the Testing Department estimated the reverberatory flue dust inventory to be as follows:

	Dry Tons	METAL CONTENT			
		Lead - Lbs.	Copper - Lbs.	Silver - Ounces	Gold - Ounces
8/30/43 Sections 5 and 6	680	146,987	118,094	4,024.29	133,340
2/23/45 Sections 1 to 4, Inc.	1,966	439,280	395,280	11,918.60	331,740
Total	2,646	586,267	513,374	15,942.89	465,080

At June 30, 1945, the Metallurgical Accounting Department established the following inventory:

2,646	308,556	513,381	15,942.91	483,705
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No removals had been made from the flue up to July 31, 1948. Consequently, the accuracy of the above inventories has not been proven. In addition to the flue inventory a large quantity of dust was stored at stock pile at time operations ceased. The combined tonnage of dust in flue and pile at June 30, 1945, was:

4,012	605,268	723,917	26,766.23	779,754
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The inventory of July 31, 1948 was:

3,278	441,188	597,564	21,799.82	626,459
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Indicating shipments of:

734	154,080	126,353	4,966.41	153,295
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Accuracy of the inventory remains for future determination.

PNYC 00012250

COPPER PLANT

INVENTORIES - COPPER PLANT (Continued)

McDougall Fine Dust

Estimate of dust tonnage in McDougall dust chamber was made twice by the Testing Department shortly after operations at the plant ceased. Using the analysis of dust removed from the chamber during the last month of operation the inventories as per tests would be as follows:

Date of Test	Total Tons	METAL CONTENT			
		Lead - Lbs.	Copper - Lbs.	Silver - Ounces	Gold - Ounces
9/24/43	500	8,000	163,000	1,500.00	50,000
10/ 2/45	1,172	18,752	382,072	3,516.00	117,200

The second test was more thorough than the first. Neither of these tests were used, however, on metallurgical reports. From time to time the Metallurgical Accounting Department estimated the dust inventory up to the time operations ceased. The inventory at that time, June 30, 1945 was:

1,600	65,800	330,250	9,400.00	310,000
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Since that time shipments have been made reducing the inventory at July 31, 1948 to:

278	9,688	135,233	1,444.34	150,110
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This would indicate that shipments had been made to the extent of:

1,322	56,112	195,017	7,955.66	159,890
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To date then, removals have been made exceeding either of the Testing Department estimates except for copper content. Only final cleanup will divulge accuracy of Metallurgical Accounting Department estimate, although to date it proved to be far superior to that of the Testing Department.

McDougall Furnace Bottoms

Tonnage of furnace bottoms has not been changed since the plant discontinued operation. The estimated content is as follows:

Dry Weight Pounds	1,056,000
Lead - Pounds	2,112
Copper - Pounds	24,531
Silver - Ounces	635.71
Gold - Ounces	45,672

Valuation is carried as \$2,298.33. No data was readily available as to method of inventorying or method of arriving at metal content. Presumption is that estimates were made on basis of previous cleanup.

Converter Copper

The only converter copper carried as inventory July 31, 1948, consisted of 65 molds at 856 pounds each for a total inventory of 55,640 pounds. This inventory is carried by the New York Office and no valuation is made by the Toledo Office.

PNYC 00012251

LEAD PLANT

ACCOUNTING PROCEDURE FOR LEAD PLANT

Records are kept by the Accounting Department to furnish the New York Office with complete data as to cost of materials for treatment, sales of product and valuation of inventories. Valuation of lead bullion inventories, however, is made by the New York Office and any profit and loss determinations made by the Tooele or Salt Lake offices are necessarily estimates. All inventory valuations of the Slag Treatment Plant are made by the Tooele Office and in that respect the accounting data on that plant is more complete than that for the Lead Plant. Final statistics, however, on both plants are available only at the New York Office. The description below briefly details features on (1) receipt and cost of materials (2) shipments and sale of products and (3) inventory valuations.

(1) Receipt and Cost of Materials

Materials purchased for the Lead Plant consist of high lead content ores, concentrates, residues, scraps and inter-plant and inter-company materials. With the exception of the inter-plant materials, all are purchased directly by the Ore Purchasing Department. Later in this report a representative contract is summarized giving the usual purchase terms. The Ore Purchasing Department prepares the settlements, issues the vouchers in payment and records the purchase cost on the general books. The purchase cost is not segregated as to classes of material purchased, only one total appearing on trial balance as "Ores Purchased - Lead Plant." Another account is kept segregating cost of ores for the Sulphide Concentrator Plant. The Salt Lake Office tabulates the ores by shippers showing full detail on metal content, metals paid for, treatment charges, penalties and net cost of ore purchased. This statement is submitted to the Tooele Office where abstracts are prepared showing metal content of all receipts. A check is thus obtained on the weight of ore and total metal content by comparing the two statements. The Tooele Office accepts the net cost as submitted by the Salt Lake Office. The inter-company materials received during July 1948 were arsenic residue from the Anaconda Copper Plant and ores from the Anaconda Copper Mining Company Darwin and Shoshone mines. The New York Office of the International Smelting and Refining Company is credited with the proceeds due the Anaconda Copper Mining Company. The purchases are all made by letter agreements. Inter-plant purchases such as reverberatory flue dust and furnace bottoms from the Copper Plant and lead fume from the Slag Treatment Plant are all purchased under schedules provided by the management. These schedules are calculated to give both the shipping and the receiving plants a fair margin of profit and the schedules are revised from time to time to equalize profits as necessity requires. These inter-plant transfers in no way affect overall profits and are made simply to provide data on profits by plants. The Salt Lake Office is provided with detail on the transfers, making one entry on the general books showing the cost to the shipping plants, offset by a credit to the shipping plants.

(2) Shipments and Sale of Products

The main product of the Tooele Lead Plant is lead bullion shipped to the American Smelting and Refining Company under toll contract. The lead, silver and bismuth are returnable and other content sold or charged for according to contract hereinafter discussed. Sales of returnable metal are made by the New York Office, hence any profit calculations by the Western Office are estimates. The returnable lead and silver are wholly owned by the International Smelting and Refining Company, although the returnable bismuth is shared on a percentage basis with the Anaconda Copper Mining Company. This is due to treatment of Anaconda Copper Plant's arsenic residue, high in bismuth content, by the Tooele Lead Plant under agreement that bismuth in bullion is to be divided between the two companies. Blast baghouse fume is shipped to the Great Falls Electrolytic Zinc Plant for recovery of cadmium. The sale is made on letter agreement and is highly profitable to both plants, the Tooele Plant disposing of an unwanted material, the Great Falls Plant being able to treat limited quantities profitably. The New York Office of the International Smelting and Refining Company is charged for the value of this material and a sales account credited. In addition to the above products some converter copper is produced by treatment of dross reverberatory speiss in the old copper converting plant. The copper bullion is shipped to the International Smelting and Refining Company, Perth Amboy, New Jersey for refining. After toll charges and agreed deductions the copper, silver and gold are returnable. As in the case of returnable lead, no sales revenue is reported to the Western Office where profit calculations must be estimated. No entries are made by the Salt Lake Office to record treatment charges or revenues from production of converter copper. Molten slag is sold to the Slag Treatment Plant under terms outlined by the management. For further particulars on this transfer see various comments in the Slag Treatment Plant section of this audit.

(3) Inventory Valuations

(a) Ore at Stock Pile

As noted under comment regarding tonnage and metal content of ore in stock pile, tabulation is made of all receipts at the stock pile by lots. The printed form from this tabulation has columns for pounds metal paid for, money paid, price deductions and treatment charges. All this information is calculated from settlements as submitted by the Ore Purchasing Department, with the exception of silver and gold valuations. Per Instructions of Mr. E. O. Sowerwine the silver

PNYC 00012252

LEAD PLANT

ACCOUNTING PROCEDURE FOR LEAD PLANT (Continued)

(3) Inventory Valuations (Continued)

(a) Ore at Stock Pile (Continued)

is priced at 34.75¢ per ounce and the gold at \$34.00 per ounce. A slight variance from orthodox method is used in arriving at ounces gold paid for. A tabulation is first made showing the amount paid for gold as per actual settlements. This cost is then divided by \$34.91, government price, to arrive at ounces paid for. This number of ounces will therefore vary with the gold paid for as calculated on settlements wherein various gold prices are used. The ounces paid for as thus arrived at, are multiplied by \$34.00 to arrive at total inventory value. Reason for this practice is discussed under comments "Inventory Valuations - Lead Plant."

After the detail for all metals is set in and footed according to the various piles, postings are made to the "Record of Stock Pile Ore." When added to the prior months inventory a "total to account for" is arrived at.

As previously mentioned, removals of ore from stock pile are determined from scale tickets showing weight, and laboratory assays for determining metal content. The weight and metal content of the removals are then posted to the "Record of Stock Pile Ore." When a pile is cleaned up, the last prior inventory is written off. Otherwise the metals paid for and the valuation thereof are set up at an average of the "to account for" as above mentioned. However, since April 30, 1948, a last-in, first-out method has been used on lead and copper valuations, replacing the "to account for" method. Having entered the receipts and removals to the "Record of Stock Pile Ore" all columns are footed to a new inventory which is transferred to a work sheet showing the treatment of crude ore. The metals paid for in all receipts are adjusted by metals paid for in inventories to arrive at metals paid for treated. Providing the pounds paid for in the treatment is less than the pounds paid for in the receipts, then the average price of the pounds paid for in the receipts is used against the treatment (last-in, first-out) and the stock pile inventory is arrived at by deduction. Example of this procedure for July 1948 on lead inventory is as follows:

	Using Stock Pile Record			Using Treatment Work Sheet		
	Pounds Paid For	Cost Per Lb.	Amount	Pounds Paid For	Cost Per Lb.	Amount
Inventory July 1, 1948:						
Stock Pile	3,344,989	9.989¢	\$ 334,133.99	3,344,989	9.989¢	\$ 334,133.99
Bins	841,527	17.18¢	144,609.65	841,527	17.18¢	144,609.65
Total	4,186,516		\$ 478,743.64	4,186,516		\$ 478,743.64
Receipts	3,974,119	17.553¢	697,576.25	3,974,119	17.553¢	697,576.25
To account for	8,160,635		\$1,176,319.89	8,160,635		\$1,176,319.89
Inventory July 31, 1948:						
Stock Pile	3,522,612	12.108¢	\$ 426,527.73	3,522,612	10.353¢	\$ 364,699.35
Bins	876,405		151,343.73	876,405		151,343.73
Total	4,399,017		\$ 577,871.46	4,399,017		\$ 516,043.08
Put into Process	3,761,618	15.909¢	\$ 598,448.43	3,761,618	17.553¢	\$ 660,276.81

By using the 17.553¢ cost on material put into process, a higher cost was used and consequently inventory lowered by \$61,828.38. Value per pound inventory was lowered from 12.108¢ per pound to 10.353¢ per pound. It is apparent that this procedure sets up inventory valuations lower than those carried on the Stock Pile Record which before application of the last-in, first-out method above described was a starting point for maintaining a reasonably low inventory. To bring the Stock Pile Record into agreement with the revised overall inventory valuation a reconciliation or revision will be necessary.

PNYC 00012253

LEAD PLANT

ACCOUNTING PROCEDURE FOR LEAD PLANT (Continued)

(3) Inventory Valuations (Continued)

(a) Ore at Stock Pile (Continued)

It was noted above that when the pounds of paid for metal in the material put into process is less than the pounds paid for metal in the receipts, then the price of metal in the receipts is used on the treatment. However, when the material put into process exceeds the receipts (some inventory treated) use of the received price is not justified. In this event, the pounds treated is divided into two parts, one being the whole received poundage with the cost thereof and the other the balance of the poundage at the prior months inventory value.

(b) Ore in Bins

After having determined the bin inventories by bin measurement and calculated weight, a tabulation of these inventories is made by lot numbers. As in the case of ores received at stock pile the metal content, paid for metals, value of paid for metals and treatment charges are obtained from settlement data and tabulated. Following instructions as before mentioned, silver is valued at \$34.75 per ounce and gold at \$34.00 per ounce. Lead is valued exactly at cost, all adjustments to arrive at a treatment at last-in, first-out cost being made on stock pile ores, as previously discussed.

(c) Ore in Process

Ores falling within this classification have two costs; namely, purchase cost and reduction cost. To arrive at the tonnages and metal content upon which to apply costs, use is made of a "worked back" inventory similar to that used by the Montana plants for inventory valuations. Only products which are in direct line of treatment, however, are worked back to an original material equivalent. The plants in order are (1) Calcining, (2) Sintering and (3) Blast Furnace. The products directly in line are therefore calcine, sinter and molten lead. Inventory of the latter product is valued by the New York Office, leaving only sinter and calcine to be worked back to their original material equivalents. A number of other materials are classed as by-products. Some are lead dross, blast matte, speiss, blast cleanings, forehearth material, blast baghouse fume, blast flue dust, converter cleanings, converter baghouse fume and sintering plant cleanings. These products are not worked back to original material equivalent on the assumption that they require further processing before entering the direct line of treatment. They are valued independently as discussed under (d) below. The sinter is worked back to material necessary to have been treated for its production. The material necessary is then further segregated by proration and assay application into custom ore, calcine and by-products. The calcine equivalent is then added to actual calcine on hand and worked back to treatment materials necessary, segregated further into custom ore and by-products. Upon the tonnages as so determined are applied fixed reduction costs to determine inventory valuation. The costs, dates they were established and July 1948 costs for comparison are as follows:

	Cost per Ton	Date Established	July 1948 Costs
Sintering Plant	\$ 2.5063	December 31, 1941**	\$ 5.4916
Calcining Plant	4.1316	March, 1947	5.0518*
Sampling	.4517	December 31, 1941**	1.4745

* Cost for 6 months ending June 30, 1948. Plant not in operation July 1948.

** Costs for 6 months ending December 31, 1941.

The purchase costs against ore in process are determined from data arrived at above in (a) Ore at Stock Pile. It was there noted that the cost of 17.553¢ per pound of lead was established for material put into process. This price is then used to value the ore in process, using the same percentage of metal paid for to metal content as first determined on treatment. The same procedure is used on copper. Silver and gold are valued at \$34.75 and \$34.00 respectively. All purchase contracts specify a deduction from metal quotation to cover freight and refining. This credit is applied directly to the costs of lead and copper to which the last-in, first-out method is applied for bin and pile inventories, but no such last-in, first-out procedure is used in following through the freight and refining credit from receipt to completed treatment. The amount involved is small and application of last-in, first-out method on this credit would involve considerable extra clerical work and detail of questionable value. Where zinc is purchased the cost is added to the lead cost. Treatment credits are also applicable to lead when stating the ore inventory in terms of lead, copper, silver and gold values, as on page 22 of the July 1948 metallurgical report, "Value of Material on Hand."

PNYC 00012254

LEAD PLANT

ACCOUNTING PROCEDURE FOR LEAD PLANT (Continued)

(3) Inventory Valuations (Continued)

(d) By-Products

By-products are valued on a different basis than ore and ore in process. As mentioned above, these products must be reprocessed before yielding their metal content in finished bullion. The money spent up to the point at which they are located is considered to have been spent for the production of bullion, and any value remaining in the by-products is assumed to be at what it might be sold for, either to an outside company or to another plant for retreatment. Accordingly, the management has provided schedules for sale of products from one plant to another and it is by these schedules that valuations have been placed on by-product inventories.

One element of "worked back" principle is involved in valuing by-products. In the comment above concerning sinter and calcine it was noted that these inventories are worked back to their components, one of which was "by-products." These equivalent by-products are then added to physical by-products on hand and a settlement, or settlements are figured on the total. At July 31, 1948, two settlements were made to show the value of by-products. A "Special Spies" high in copper content was valued separately, the balance of the by-products being calculated on a different schedule. The "Special Spies" was valued on a schedule predicated upon cost of recovering copper content at the old converter plant. The schedule as used therefore included a high treatment charge (\$15.00) per ton and a high penalty (75¢) per unit on arsenic. No segregation of the by-product values is obtainable on published metallurgical reports. The values are combined to arrive at a total inventory.

The settlements prepared for valuing by-products are used for obtaining metal content, metals paid for, freight and refining allowances and treatment charges comparable to like information taken from ore settlements to arrive at data on ore in stock pile and bins. Since the by-product inventories contain considerable lead and copper a last-in, first-out method of pricing these inventories is used. The prices as used were the approximate metal prices at the time an increment was made to the inventory. At July 31, 1948, the pounds of lead and copper in the inventory and the segregation according to price was as follows:

Lead		Copper	
Pounds	Price	Pounds	Price
447,058	4.50¢	21,079	8.50¢
1,272,820	6.50¢	517,632	11.775¢
230,200	15.00¢	67,227	18.008¢
155,394	17.50¢	132,120	20.535¢
		196,137	20.497¢
		100,608	20.538¢
2,105,472		1,034,800	

(e) Finished Inventories

Inventory classifications above account for all valued material with the exception of lead bullion. Finished lead bullion is valued by the New York Office. All necessary data pertaining to lead bullion is supplied on metallurgical report "Lead Bullion Production" page 20 of the July 1948 statements.

RECEIPTS - LEAD PLANT

Contract Provisions - General

All materials purchased for treatment at the Lead Plant are purchased under definite contract terms or upon open schedule for shipments in smaller quantities. Inasmuch as smelting ores are purchased for their slag making qualities and absence of deleterious elements as well as for recoverable metal content, the contracts vary somewhat from those used for purchase of milling ore.

On the pages which follow informative data is given concerning plant procedure in accounting for receipts of ore and other treatment materials. As contract terms for the most part follow the same pattern, a synopsis is here given of contract with R. K. Hamilton and L. F. Jacobson for purchase of lead ore and lead concentrates, contract terms being illustrative of those with other companies.

PNYC 00012255

LEAD PLANT

RECEIPTS - LEAD PLANT (Continued)

Contract Provisions - General (Continued)

Metal Payments:

Gold	If .02 ozs., per ton or over, pay for 91% at \$35.00 per ounce.
Silver	Pay for 95%. Minimum deduction .5 ounce.
Lead	Deduct 1.5 units from wet assay and pay for 90% less 1.8555¢ per pound.
Copper	Deduct 15 pounds per ton and pay for balance at New York price less 6.3555¢.
Zinc	If 7% or over pay for 75% at 25% of East St. Louis price.

Treatment:

Labor	Base charge \$4.564 per dry ton on 20% settlement lead, plus or minus 10¢ per unit above or below 20%.
Bullion Freight	Base \$8.89. Add or deduct 15¢ to base treatment charge for each 25¢ increase or decrease in labor rate.
Insoluble	Base \$19.61. Any increase or decrease in this rate for the account of the shipper.
Iron	Charge for all at 10¢ per unit.
Lime	Credit all at 6¢ per unit.
Zinc	If 5% or over, credit at 6¢ per unit.
Sulphur	Charge for all at 15¢ per unit if paid for. When no payment made penalty will be 25¢ per unit for excess over 5%.
Arsenic and Antimony	2% free. Charge for excess at 25¢ per unit up to a maximum of \$2.50 per ton.
	2% free. Charge for excess at 50¢ per unit.

Duration

Effective on receipts of March 1, 1948, for a six months period.

Ores and Concentrates from Combined Metals Reduction Company

Receipts from the Combined Metals Reduction Company consist of crude ore from various locations and lead concentrates from its plants at Bauer, Utah, and Pioche, Nevada. Factors determining the quantity taken into metallurgical receipts for the month are (1) availability of silver affidavits and (2) availability of data necessary to enable clerical force to report plant profits by 12th day of month. Date of weighing or date of dumping or sampling do not therefore govern the quantity of material received. Practice is therefore somewhat at variance with that at the Montana plants of the Anaconda Copper Mining Company where date of weighing governs receipt of custom zinc concentrates and Butte Hill Mine ore. Reference to summary of Combined Metals Reduction Company concentrates received showed for example, that lots 5057, 5060 and 5061 were sampled on June 29th and 30th, 1948, and weighed prior thereto, but were taken into July 1948 receipts. Mr. W. H. Floyd, Chief Clerk, stated that although the lots may have been weighed and dumped into bins, adjustments were made eliminating them from bin inventories and record of receipts if silver affidavits were not forthcoming, or if complete settlement data was not available to complete computation of profits by the 12th of the month.

Scale tickets are sent to the General Office, as are moisture reports from the Sampling Mills. The gross, tare, and net weights and the moisture percentages are entered upon a form known as "Record of Lead Ore Received." This form also includes space for mine lot number, smelter lot number and car number. The lot numbers, the net weights and the moisture percentages from the "Record of Lead Ore Received" are used in the preparation of a "summary" or "abstract" tabulating all receipts by the month. Another report entitled "Report of Material Sampled" is prepared for the Salt Lake Office. It includes the lot number, car number, name of shipper, date weighed, date sampled, net wet weight of ore, moisture percentage, dry weight of ore and where dumped. From this report, together with assay reports from both the shipper and the smelter the Salt Lake Ore Purchasing Department prepares the settlements. The Tooele Office completes its summary or tabulation by use of settlement assays in calculating the metal content. The total ore or concentrates received is then entered upon the metallurgical report "Statement of Custom Material Received - Tooele Lead Plant." Cost of material is reported to Tooele by the Salt Lake Office where entry is made upon the general books.

PNYC 00012256

LEAD PLANT

RECEIPTS - LEAD PLANT (Continued)

Crude Ore and Concentrates from Anaconda Copper Mining Company - Darwin Mines

Crude ore and concentrates from both the Darwin and Shoshone mines of the Anaconda Copper Mining Company are purchased under terms quoted in letter of June 18, 1945, Mr. A. B. Young to Mr. E. O. Sowerwine. Cars of crude ore from the Darwin mine are combined into composite lots for assay and settlement. Concentrates from both mines are sampled and settled for by composite car lots.

Accounting procedure for receipt of these ores and concentrates is identical to that described for receipts of ore and concentrates received from the Combined Metals Reduction Company, except that assays of the International Smelting and Refining Company are accepted by the other companies, no comparison of assays being made.

Residue from American Zinc Company of Illinois

Residue from the American Zinc Company of Illinois is received under contract dated April 9, 1947, which provides for return of 80% of zinc content in form of delead zinc fume at International, Utah, all other metals being outright purchases. Inasmuch as treatment charges may outweigh purchase costs the American Zinc Company is then billed for net treatment charges due.

Accounting procedure for receipt of residue is identical to that described for receipts of ore and concentrates from the Combined Metals Reduction Company.

The contract provides that the zinc in fume will be returned currently as the zinc residue is purchased and treated and adjustments in the amount of returnable zinc will be made in the next calendar month.

The duration of the contract is for a one year period from April 9, 1947 to April 9, 1948 and extending beyond that period subject to a 90 day notice of cancellation. Such notice of cancellation was given to the American Zinc Company by the International Smelting and Refining Company on September 8, 1948, due to unprofitability of treating its residue. Negotiation since that date has effected revision of the additional treatment charge from \$4.50 to \$9.00 per dry ton, effective November 7, 1948, American Zinc Company to continue shipping its residue under the new rate.

Residue from Anaconda Copper Mining Company

Residue from the Anaconda Copper Mining Company is purchased under letter of July 1, 1941. This residue is a product of the Anaconda Arsenic Roasting Plant and is produced from high bismuth content flue dust removed from the Main Cottrell Treaters. It is stored at stock pile and at periodic intervals shipped to Tooele where the Lead Plant recovers the bismuth in lead bullion in addition to other metals. The lead bullion is then shipped to the American Smelting and Refining Company at Omaha, Nebraska on toll, both the lead and the bismuth being returned to the International Smelting and Refining Company. By agreement, the Anaconda Copper Mining Company shares equally with International in the proceeds of the returnable bismuth. Ninety percent of any bismuth in the bullion above .25% is returnable.

Accounting procedure and records are the same as previously discussed concerning receipt of ore and concentrate from the Combined Metals Reduction Company.

Letter of July 1, 1941 under which terms of purchase were stated was from Mr. A. B. Young, Assistant Manager of the International Smelting and Refining Company to Mr. W. E. Mitchell, Manager of Anaconda Reduction Works. Reference may be made to letter for terms. No provisions were made regarding splitting limits and umpiring. In letter of Mr. A. E. Wiggins, then in charge of Montana metallurgical operations, to Mr. J. O. Elton on July 15, 1939 the following splitting limits were suggested:

Gold	.006 ozs., per ton
Silver	.5 ozs., per ton
Lead	.5%
Copper	.5%
Bismuth	.15%

These splitting limits have since been used. In addition a 1% splitting limit was put into effect on other metals per information in letter of November 20, 1940, from Mr. Rom Warburton to Mr. George A. Dean, former Chief Clerk at Anaconda Reduction Works quoting Mr. A. B. Young instructing use of 1%. Upon comparison of assays at Anaconda the sample is sent to the Anaconda Copper Mining Company Washoe Sampler at Butte, Montana, where all umpires except bismuth are determined. As the Sampler does not have facilities for bismuth determinations, sample is sent to the Great Falls Reduction Department for umpire.

PNYC 00012257

LEAD PLANT

RECEIPTS - LEAD PLANT (Continued)

Lead Fume from Slag Treating Plant

For purposes of determining Lead Plant and Slag Treating Plant profits independently a settlement is prepared to arrive at a value of the material transferred from one plant to the other. The management has prepared a schedule detailing metal payments, recovery percentages and treatment costs to be used in calculating the transfer cost.

Lead fume from the Slag Treating Plant is one of the interplant transfers. Actual weight of the fume is obtained. The Sampling Department obtains samples on the transfers from which monthly moisture percentage and assays are obtained. By application of monthly Engineering and Mining Journal quotations and the terms as outlined by the management a settlement is prepared.

When inventories of lead fume exist at the Lead Plant the quantity of fume settled for is the amount treated. The inventory is carried at Slag Treating Plant and the deliveries to the Lead Plant are adjusted by first and last of month inventories to arrive at Lead Plant treatment, for which settlement is made. This procedure simplifies inventory accounting.

The Journal entry to record the transfer is made by the Salt Lake Office and is as follows:

Inter Plant Transfers - Lead Plant
Inter Plant Transfers - Slag Plant

When other inter plant transfers are made, the amounts are combined and entered to the Journal in total.

Reverb Blue Dust and Furnace Bottoms from Copper Plant

The transfer of Copper Plant materials to the Lead Plant is made in accordance with the principles described above for transfer from the Slag Treating Plant.

The Journal entry recorded by the Salt Lake Office is as follows:

Inter Plant Transfers - Lead Plant
Inter Plant Transfers - Copper Plant

SHIPMENTS - LEAD PLANT

Lead Bullion Shipped to American Smelting and Refining Company, Omaha, Nebraska

Lead bullion is shipped to the American Smelting and Refining Company at Omaha, Nebraska, under terms of contract dated May 27, 1946 for a ten year term commencing June 15, 1946 and expiring June 14, 1956. Contract provides for a shipment of bullion averaging between 95% and 99% lead, between .4 and .7 ozs., per ton gold, between 70 and 110 ounces per ton silver and between .2% and .6% bismuth. Content of impurities is also specified. Twenty days after receipt of the bullion at Omaha the American Smelting and Refining Company is obligated to return a quantity of refined lead equivalent to the entire lead content of bullion as determined by wet assay, less a deduction of 8 pounds of lead per ton of bullion. The refined lead must not contain more than 1% bismuth. Ninety-nine and one-half per cent (99.5%) of the gold content is paid for at government price. Silver and bismuth are returnable under the contract, the silver at 100% of content and the bismuth at 90% of content over .25% contained in bullion. Silver and bismuth are returnable 40 days after receipt of bullion at Omaha.

As compensation for refining the bullion the American Smelting and Refining Company receives \$6 per ton lead bullion with adjustments for changes in labor rate and zinc price. For each 1¢ per hour increase or decrease in labor rate a charge or credit, respectively, of 5¢ per ton of lead bullion is made. A charge or credit of 1¢ per ton of lead bullion is also made for each 1¢ that the average zinc price shall be in excess of, or less than basic price of 8.25¢ per pound. The contract also provides for an increase in base charge due to increase in various supply costs as determined by the U. S. Department of Labor, Bureau of Labor Statistics. This provision, however, is effective only during the last five years of the contract. For all silver returned the American Smelting and Refining Company charges 1.5¢ per ounce, and for all bismuth returned, 50¢ per pound. Charges are also made of \$1 per unit of antimony contained in the bullion and \$2.50 per unit of other impurities including copper, arsenic, tin and tellurium. Splitting limits for determination of settlement assays are provided by the contract, and provision is made for use of umpires. The above briefly outlines the main features of the contract to which reference may be made for more detail.

PNYC 00012258

LEAD PLANT

SHIPMENTS - LEAD PLANT (Continued)

Lead Bullion Shipped to American Smelting and Refining Company, Omaha, Nebraska (Continued)

The Omaha plant samples the bullion by lots, and also makes a composite monthly sample. Lot sampling is done to obtain silver and gold assays, and other assays are determined from monthly composite samples. The contract specifically provides that settlement shall be made on the last day of the month following delivery of the bullion or as soon thereafter as all necessary information is available. Preparation of production data by the Tooele Office must therefore be made on the best available information at time of closing. For example May 1948 final settlement was not available until July 1948 production was being calculated at which time adjustment was made for estimate of May 1948 delivery previously used to arrive at May 1948 production. No final data on June 1948 delivery was yet available. July 1948 deliveries were estimated by use of Omaha weights and Tooele assays.

The Omaha plant reports the weight of bullion in each car received and also reports three times monthly the cars lotted for settlement purposes. Four cars constitute a lot. Each lot weighs approximately 240 tons. Although the contract specifies lots of about 180 tons, the larger tonnage has been mutually agreed upon due to capacity of kettles used in refining. Car numbers, Tooele lot numbers, dates received, Omaha weights and lot numbers, and estimated metal content appear on the three reports sent from Omaha during each month.

Each company sends its assays to respective offices of each company in Salt Lake City, Utah, where assays are compared. If umpires are needed the Omaha plant is notified and a sample forwarded from there to the designated umpire assayer.

After all weights and assays are complete the Omaha Office compiles a monthly statement showing the weight of bullion, settlement assays, metal content, returnable content, gold paid for and monthly settlement showing the charges and credits as per contract terms. This statement is checked by the Tooele Office and the data used as final delivery for computation of production statistics.

Accounting for returnable metal is done by the New York Office of the International Smelting and Refining Company. That office also makes settlement with the American Smelting and Refining Company for toll charges on refining.

Blast Bag House Fume Shipped to Anaconda Copper Mining Co., Great Falls, Montana

Tooele blast bag house fume is a cadmium bearing product of the blast furnace operation. Due to impurities in the fume, treatment at the Electrolytic Zinc Plant at Great Falls is limited to one or two cars per month. There the fume is introduced to the zinc roasters in order to improve the solubility of the cadmium and eliminate part of the arsenic and antimony ahead of the leaching plant. In the leaching plant the zinc and cadmium are partially extracted and the residue metals go into the main zinc plant residue for shipment to the American Smelting and Refining Company at East Helena, Montana.

A proposed schedule for purchase of bag house fume was submitted by Mr. Caples on November 13, 1945. This schedule was to be effective on and after November 1, 1945, and was accepted by the International Smelting and Refining Company. Its terms, still in use, are as follows:

Payment for metals:

Lead	-	Net assay, less 1.5% x 90% at New York price less 1.50¢ per pound.
Silver	-	Deduct one ounce from assay and pay for balance at New York price (90¢ price now substituted).
Gold	-	80% if .01 oz. per ton or over, at \$33.78 per ounce.
Cadmium	-	60% at price received by Anaconda, f.o.b., Black Eagle, Montana, for sales in previous month, less 15¢ per pound.

Treatment Charge:

\$3.00 per dry ton, f.o.b., Black Eagle, Montana.
.125% arsenic plus antimony free. Charge \$2.00 per ton for (each) .1% arsenic plus antimony in excess of .125%. Fractions pro rata.

In letter of July 15, 1939 Mr. A. E. Wiggin wrote to Mr. J. O. Elton requesting that an average of Anaconda and Tooele assays be used in making settlements for Anaconda arsenic roaster residue. Prior to that date Tooele assays had been used. Following up Mr. Wiggin's request, Mr. A. B. Young, then Assistant Manager at Tooele, suggested that split assays also be used on bag house fume. Great Falls assays had previously been used. Mr. Caples, on December 6, 1939, suggested a splitting of 1/3 on cadmium. Since

PNYC 00012259

LEAD PLANT

SHIPMENTS - LEAD PLANT (Continued)

Blast Bag House Fume Shipped to Anaconda Copper Mining Co., Great Falls, Montana (Continued)

that date limits of .3% on lead, .3 ozs., per ton on silver and .005 ozs., per ton on gold have also been established. The Anaconda Reduction Works Assay Laboratory has been used for making umpire determinations.

Cars of fume shipped to Great Falls are weighed at Tooele although freight is paid and settlement made on weights at Black Eagle, Montana. Upon receipt at Great Falls Reduction Department a sample is obtained for determination of moisture percentage and assays. A sample is sent to Tooele with a letter of transmittal giving Great Falls lot number, Tooele lot number, date received at plant and weighed, car number, weight, percent moisture and dry weight pounds. Settlements are prepared at Great Falls. It was noted that rather than calling for umpires when assays differed by more than the splitting limits, repeats from both parties were called for. In all instances the repeats brought the assays within the splitting limits. Presumption is that if the repeats still exceeded the splitting limits use of umpires would be used. Upon receipt of settlements by the Tooele Plant the metal content is calculated and is properly used in determining plant recoveries. Metallurgical report is prepared showing detail of shipments by lot numbers, and also composite data on all settlements showing metal content, metal prices, metals paid for, freight and treatment costs, and total charges and credits in dollars. The Salt Lake Office records the sale of fume on the General Books. The charge is made to "International Smelting and Refining Co., New York" and the credit to "Blast Bag House Fume Sold to Great Falls."

Converter Copper to Raritan Copper Works

Spills from the Dross Reverberatory Plant is periodically treated at the old Copper Converting Plant for recovery of copper. This copper is then shipped as bars to the Raritan Copper Works at Perth Amboy, New Jersey. A deduction of 5 pounds per ton of copper is made from the copper content and the balance is returnable. The silver and gold are returnable 100%. The copper is returnable 60 days after sampling and the silver and gold ninety days after sampling. All charges for treatment, and all records pertaining to the return of metals are handled by the New York Office.

Lot No. 7, carried as on hand at Tooele at June 30, 1948, was shipped June 28, 1948. Lot 8 was shipped on July 1, 1948. Car containing lot No. 7 (NYC 133798) was damaged in transit and 5 pieces of copper were lost. The remaining content of the car was transferred to car PRR 33123 and arrived at Raritan August 5, 1948. Lot No. 8 arrived at Raritan on July 29, 1948 and was taken into account as a July 1948 receipt, preliminary returnable metal content being determined on the basis of Tooele assays, but using Raritan weights.

The loss of 5 pieces of copper was recorded as "Five (5) pcs. short on Raritan Copper Works Arrival Notice. Personnel of the Tooele Office stated that the Tooele Valley Railroad had investigated records on the number of pieces loaded. See under "General Remarks - Shipments from Lead Plant - Converter Copper Lost in Transit to Raritan Copper Works."

Due to the delay in arrival of these cars at Raritan, lack of final assays and loss in transit, decision was made to defer all adjustments to production until August, 1948, when final weights and assays were available. As both cars were produced in June, 1948, production for that month was accepted as final until adjustment was determined in August, 1948.

As stated above all treatment charges are handled by the New York Office. Files in the Ore Purchasing Department at Salt Lake yielded the following information on treatment charges for May, 1948, last month on record:

Base rate per ton		\$ 20.0000
May, 1948, labor rate	135.834	
Base labor rate per hour	52.50	
	83.334	12.4995
June cost of fuel oil per gallon	7.4554	
Base cost per gallon	2.860	
	4.595	3.2165
Total Refining Charge per Ton		\$ 135.7160

PNYC 00012260

LEAD PLANTOre in Stock Piles

Each day a "Daily Car Report" is prepared by the Operating Department showing car numbers of ore dumped at stock piles. These car numbers are then checked to the report "Record of Lead Ore Received" which gives the gross, tare and net weights of the car and its lot number. Having thus secured the lot number the car may be identified on the Abstract of Ore Received which gives the full detail of metal content. The lots which have been stored are then posted to a summary or disposition statement where totals are kept by shippers and by piles to which ore has been stored. The various storages are then posted to a "Record of Stock Pile Ore" which contains summary of the inventories, receipts and removals of stock pile ores.

When ore are removed from stock piles, scale tickets are sent to the Metallurgical Accounting Department where tabulations are made in a "Record of Deliveries Between Departments." Upon removal from stock piles the ore is sampled and the laboratory reports assays by which the metal content is determined. The Sampling Department also obtains the moisture percentages. With the information then complete as to the weight and assay, the Metallurgical Accounting Department then calculates the metal content, which, along with net and dry weights are posted to the "Record of Stock Pile Ore." Having thus entered the receipts and removals a new inventory is arrived at.

Some exceptions to the above practice occurs due to impossibility of balancing out stock piles by assays. For example, a pile may be cleaned up. Laboratory assays are reported in the usual way for determining metal content of the cleanup. This metal content as thus determined may vary considerably from that remaining on the "Record of Stock Pile Ore." The assays in those instances are disregarded and the book inventory is written off. Similarly at times some metal might be written down to nil while others remain in the inventory. Laboratory assays must be disregarded in instances of this kind. When negligible quantities of a metal remain in inventory, the laboratory assay on removal may also be lowered to maintain some metal in the inventory. These procedures are common in metallurgical accounting practice. The alternative method is to make removals at the average of what was remaining in the inventory in the month prior. Where the material is of consistent nature this practice is very practicable, and in some instances the stock pile at the lead plant are handled in this manner. However, due to the complexity of the ores, the procedure as outlined above seems the most satisfactory.

Ore, Concentrates, Residue and Scrap Cable on Hand at Sintering Plant and East Furnace Smelting Plant

Almost without exception receipts of ore and other materials are dumped to storage bins. One section of bins is known as "Receiving Bins" and is lettered consecutively from A through S. These bins are sampling mill bins. Usually the inventories are determined by reference to dump reports showing materials entering the bins. If the material has not been sampled the lot or lots entering the bin are carried on hand. Data is obtained from settlements.

After sampling the ore is conveyed to lead plant bins by a system of conveyor belts. There are 22 sintering plant charge bins each having a capacity of 120 tons of ore or 240 tons of concentrates. Because the ore which enters these bins may be mixed with other ores it is necessary to obtain the inventory tonnages by measurement and a segregation later made from plant reports as to kind of ore stored. The clerks from the Metallurgical Accounting Department take measurements of the bins at 8 A.M. on the first of each month. The capacity of all bins has previously been determined and a record is available giving the volume in cubic feet for each foot depth, or conversely the record shows the volume for each foot empty depth. After having measured the bins and obtained the volume on hand, the volume is multiplied by the weight per cubic foot applicable to the type of material stored. These weights have been determined by the Research Department. Since ores vary in consistency and weight, the Sampling Department also from time to time obtains weights on ores from various shippers. After the weight of ore in bins has been determined, reference is made to a Sintering Plant Daily Bin Report which records the estimated tonnages on hand and the receipts to each bin identified as to kind. A segregation of the tonnage is thus possible by lot number and the metallurgical inventories are determined by assays and payment data from settlements applicable.

In addition to the 22 sintering plant bins as above described are 30 other bins, each having a capacity of 110 tons and which hold the various constituents to the blast furnace charge. Unsampled material such as coke and scrap iron are stored in these bins, as well as sinter, linerock, cleanings, etc. Inventory of these bins is determined by measurement as above described.

Also used for storing lead ores are "Miscellaneous Bins" lettered A to G inclusive and "Old Bins" numbered 1 to 11 inclusive. These bins are used for both lead plant and sulphide concentrator ores and are measured in manner described above.

PNYC 00012261

INVENTORIES - LEAD PLANT (Continued)

Ore Concentrates, Residues and Scrap Cable on Hand at Sintering Plant and Blast Furnace Smelting Plant (Continued)

Customarily used for sulphide concentrator ores are bins 1B to 10B inclusive. However, some lead ores were stored in these bins during July 1948. Inventories are determined by measurement, although during July 1948 some lots retained their identity and inventory was determined from actual lot weights and assays.

In addition to the above bins some storages are made at other places. For example, some Raritan residue was stored at the Oxide Warehouse and scrap cable at various locations. No accurate reports are received concerning these inventories and reliance is placed by clerks on telephone calls concerning them.

After all inventory tonnages of these materials have been assembled and identified by lot number, the metal content is determined by settlement assay. For determining plant recoveries a segregation is made showing the plants to which the inventories belong. This segregation appears on the metallurgical report "Ore, etc., on Hand" to which all inventories are posted.

Sinter

As noted in the Synopsis of Plant Operation the fine material treated at the lead plant, such as concentrates, flue dust, etc., requires sintering to agglomerate it before including it in the charge for the blast furnace. The material fuses slightly and forms a clinker-like mass which is discharged at the end of the machine and falls into railroad cars, either for immediate treatment, or for storage. The sinter inventory at July 31, 1948 consisted of both car and bin inventories. At the end of each month the Accounting Department takes a car inventory. Scale tickets are received by the Metallurgical Accounting Department and a tabulation made showing weight of all material reported on the Tram inventory or "Switch list." The bin inventories are measured and tonnage determined by application of weight per cubic foot to measured volume. The car and bin inventories are then combined for inventory purposes. A uniform moisture of .75% is used to calculate the dry weight. The laboratory makes assay determinations on a monthly sample, and these assays are used to arrive at the metal content of the inventory.

Calcine

Speiss from the blast furnace operation, being high in arsenic is roasted for removal of that element. Speiss is stored at stock pile and periodically roasted in a McDougall roasting furnace. The resulting calcine, having substantial quantities of copper, silver and gold is stored at stock pile and later removed in Tooele Valley Railroad cars to lead plant bins for retreatment. For simplicity the stock pile and storage bin inventories are combined on metallurgical accounting records. The bin inventories are calculated in the same manner as are ores; i.e., by measurement and application of weight per cubic foot to calculated volume. The weight of stock pile removals is then adjusted by the bin inventories to determine the lead plant treatment. Providing there have been additions to the stock pile (none during July 1948) laboratory assays are used to determine metal content. The metal of removals is determined by taking an average of the first of month inventory and the receipts. The treatment tonnage is used as the removal and the remaining inventory automatically includes all inventories, both stock pile and lead plant bins. Independent tonnage of each may be calculated, however, if desired. The method in use is the most simple and direct.

Sintering Plant Cleanings, Etc.

At July 31, 1948 the following inventories were grouped under this heading: (1) preroast (sinter), (2) flue dust, (3) pond cleanings, (4) belt cleanings and (5) yard cleanings.

The object of the sintering plant operation is to obtain a product suitable in physical characteristics for treatment at the blast furnace, and to reduce the sulphur content from about 1.2% in the charge to about 1.2% in the sinter. On the first sinter, or preroast, the cakes fall onto a pan conveyor to be delivered to the preroast crushing plant. On the second sinter the cakes fall onto a grizzly, the coarse sinter being bypassed to railroad cars for delivery to the blast furnace charge bins and the fines falling onto a pan conveyor for retreatment on the preroast charge. The preroast sintering is carried out on the first machines; i.e., those serviced by the pan conveyor. When more machines are required the sinter must be discharged into railway cars and taken to the preroast storage bins without crushing. The sinter from the first 6 machines is discharged onto the horizontal pan conveyor, then through a crushing plant and to preroast storage bins. They are located at the original charge floor and their hoppers feed onto the original gathering belt. The bins are measured on the first of each month to obtain the cubic feet of inventory. This volume is then multiplied by an average weight of sinter per cubic foot to arrive at total tonnage. The laboratory makes assay determinations on an inventory sample. The Metallurgical Accounting Department calculates the metal content of the inventory from the assays as reported.

PNYC 00012262

INVENTORIES - LEAD PLANT (Continued)

Sintering Plant Cleanings, Etc. (Continued)

The flue system inventory at July 31, 1948, consisted of dust in the following locations: (a) dry flue or "Header" flue, (b) moisture chamber, (c) main flue, (d) treater intake, (e) stack base, (f) stock pile and (g) cars and bins. The flues leading from each sintering machine are 30 inches in diameter and made of sheet steel. The flues of each pair of adjoining machines merge before entrance to the main flue system. The first section of the main flue system is a brick structure, 10' x 14' x 141'. The coarsest material, the dust mechanically carried over, is mostly deposited in this section of the flue. This flue is cleaned about once a year. On the average 1 1/2 tons of dust per day is deposited in this header section. Its assay will approximate that of the charge. The gases pass from the brick header flue into a brick moisture chamber, 21' x 27' x 110'. Because of the increased area and a number of water sprays the gases are here considerably cooled. In this section finer dust settles than in the header section. The water aids in this dust settling. About 1 1/2 tons of dust and fume per day are precipitated in the moisture chamber. The water is run into a pond where separation of the water and solids takes place by evaporation (see below). The moisture chamber delivers into a third section of the flue (main flue) which is made of brick and is 10 1/2' x 14' x 260'. This flue section delivers directly into 3 treater intakes, each 7' x 6' x 60'. The 3 treater intakes are equipped with automatic dampers which control the distribution of the gases into the 3 treater sections. The treater proper consists of 3 parallel horizontal flues or units. Each unit is divided into 4 sections. The gas stream flows through the sections and the dust is electrically precipitated. The precipitated dust is removed by beating a yoke that supports the collecting grids with an air hammer. This is done automatically once every two hours. The dust falls into tar lined wooden hoppers located under the units. A screw conveyor runs along the bottom of the hoppers to remove the dust to small cars. The small cars are hand trammed to larger railroad cars, the dust in which is unloaded at the sintering plant charge bins for retreatment. A fan blows the gas from the treater sections into a 150 foot brick stack. Occasionally some flue dust is stored at stock pile and in storage bins. Determination of tonnages is made by the Research Department and periodic changes made as required. Fixed assays, determined by prior sampling, are used to determine metal content. For further comment on flue dust inventories see under "Comments - Inventories" - Lead Plant - Sintering Plant Flue Dust."

As noted above, the water from the moisture chamber carries the dust and fume out with it to a settling pond. The pond is divided into two sections, one being filled while the other is drying and waiting to be cleaned. Inventory in ponds is by visual observation. At periodic intervals each pond is cleaned and removed to stock pile, actual weights being obtained from contractor making the haul. Accurate weights are also obtained on removals, and monthly moisture percentages and assays are used to determine dry weight and metal content. Mr. Floyd reports that difficulties are encountered in getting accurate inventories at pile due to mixing of pond cleanings with those from other departments. Adjustments are made when pile has been cleaned up and new inventories started. This occurred during July 1948. The old pile was cleaned up, and removals after July 15, 1948, made from the new stock pile.

Belt and yard cleanings are sampled and monthly moisture and assay determinations are made for arriving at dry weight and metal content. The cleanings may be in bins, in Tooele Valley railroad cars, yard or stock piles. The bins are measured and weight calculated according to method previously described for ores. Actual weight of railroad cars is obtained.

Lead Dross

When a dross layer is formed on the dressing kettle it is skimmed off the top of the lead bath by means of a sieve ladle operated by a crane. The ladle is set over an empty dross kettle and the molten lead is allowed to drain out. When most of the lead has drained out, the ladle of dross is removed by the crane to the Dross Reverberatory Furnace. Method of dross removal is similar on both the 60 and 120 ton dressing kettles. At July 31, 1948, the dross inventories consisted of that in Tooele Valley Railroad cars and some in storage. Actual weights were obtained on the railroad cars and the storage pile was estimated by visual observation. Assay determinations are made from a sample of dross on hand. The assays are applied to the total dross inventory to obtain the metal content. The dross is assumed to be dry, no moisture percentage being used.

Blast Matte (Dross Reverberatory Matte)

This matte is a product of the Dross Reverberatory Plant, where matte, speiss and molten lead are produced from dross. The matte is sold to the American Smelting and Refining Company, the speiss is periodically treated at the Copper Plant converters and the lead is returned to the Dressing Plant. The inventory at July 31, 1948, consisted of matte in (1) Tooele Valley Railroad cars, (2) storage bins and (3) in transit to the American Smelting and Refining Company at Garfield, Utah. The bin inventory is determined by measurement and calculation. Car weights are actual. Shipments to Garfield are considered final only when settlement is completed. Two cars were shipped during July, 1948, one on the 22nd and one on the 31st. Neither had been settled for at time metallurgical reports were in preparation and were carried in the inventory. The metal content of the bin and car inventories is determined by assays on a monthly sample. Each car shipped to Garfield is assayed, metal content for inventory purposes being determined on Tooele weights and assays. Final settlement assays however, are used on final metallurgical data.

PNYC 00012263

INVENTORIES - LEAD PLANT (Continued)

Lead Residue "Speiss"

Speiss may be from the blast furnace or the dross reverberatory furnace. The former is usually stored and periodically treated in the old McDougall roasting furnace for removal of arsenic, the resulting calcine being returned to the Sintering Plant. The speiss from the dross reverberatory furnace is high in copper content, and is stored in stock piles for future treatment at the Copper Converter Plant for recovery and production of copper. Separate stock piles are maintained for each class of speiss, and during July, 1948, the dross reverberatory speiss was also segregated into two separate piles. The inventory at July 31, 1948, consisted of speiss in: (1) stock piles, (2) Tooele Valley Railroad cars and (3) converter ladles. Additions to, or removals from the stock pile are by actual weight of cars. Inventory in railroad cars is taken by the Accounting Department and scale weights obtained. Inventory in converter ladles is determined by visual estimate. At July 31, 1948 there were 42 tons in ladles. Monthly samples are taken from which moisture percentage and assays are determined for arriving at dry weight and metal content of the inventory. For further comment on this inventory see under "General Comments - Inventory Changes to Arrive at Reasonable Recoveries."

Blast Cleanings

This inventory consisted of furnace barrings and cleanings from around the furnace. Both are loaded into cars and returned to lead plant bins for retreatment. Actual weights are obtained on fully loaded cars, although the cleanings are accumulated during the month and are estimated visually if cars are only partially full. Bin inventories are measured and weight calculated. Monthly inventory samples are taken upon which assays are determined to arrive at metal content.

Forehearth Material

Slag and speiss are tapped from the blast furnace into large moveable forehearth. Separate layers are formed in the forehearth, the slag being tapped for treatment at the Slag Treatment Plant and the speiss being tapped for further treatment at McDougall roasting furnace for removal of arsenic. After the tapping is complete the cold shell remaining is removed to the Copper Converter building where it is broken up by mechanical means. It is returned for retreatment at the Sintering Plant or the Blast Furnace. The inventory at July 31, 1948, consisted of forehearth material at the Sintering Plant bins and at the Converter building. The inventory in the bins is determined by measurement and calculation. The inventory at the Converter building consisted of 30 tons on the floor, 10 tons in ladles and 30 tons of "buttons" or high lead content material. These tonnages were determined by estimation as cost of weighing would be prohibitive. A sample is taken monthly from which assays are determined to arrive at metal content.

Blast Flue Dust

A brief description of the blast furnace flue system is as follows: The gas offtake is located in the back of the furnace just below the charge floor. The offtake runs downward 30 feet into a large dust collecting tank 20 feet in diameter and 18 feet high. The size of the tank allows the gases to slow down and drop part of their dust burden. Flue gas passes from the top of the tank into a sheet iron balloon flue that leads to the baghouse. The dust collecting tank is equipped with a hopper bottom that discharges onto a conveyor belt discharging into a railroad car and returning to the sinter circuit. The sheet iron balloon flue leading to the baghouse has a hopper bottom to facilitate cleaning which is done about twice a year. When cleaning, the hoppers are opened and the dust is allowed to fall out on the ground. The dust is shoveled up into dump trucks and returned to the sintering plant circuit.

Tonnage in the flue is usually arrived at by estimate. Cleaning of the flue is done about twice a year and approximately 100 tons of dust are removed each time. During July, 1948, the flue was torn down to be replaced and all dust was hauled by truck to stock pile. Conservative fixed assays were used for flue inventory. Comparison of fixed assays with July 1948 shipments to Sintering plant is as follows:

	<u>Lead</u>	<u>Copper</u>	<u>Silver</u>	<u>Gold</u>
Fixed	20.20%	0.80%	6.05 o/t	0.05 o/t
July 1948	31.80%	1.20%	10.65 o/t	0.05 o/t

Since assay on feed varies and will produce dust of varying grade the conservative assays as used seem warranted, especially since tonnage is not large.

PNYC 00012264

INVENTORIES - LEAD PLANT (Continued)

Blast Bag House Fume

The baghouse is a brick building containing 144 woolen bags that are 30 feet long and 18 inches in diameter. By changing pressures in the baghouse the bags are collapsed, loosening the dust which falls into the pits. Once a week the bags are shaken by hand from the inside. This shaking removes the dust that could not be removed otherwise. The dust in the pit is burned once a week. This is done to clinker the dust and thus make it easier to handle. Metallic cadmium, metallic arsenic, elemental sulphur and small portions of coke dust furnish the fuel value for this burning. The pits are flat-bottomed, and the dust clinkers are removed by laborers and returned to the sintering plant circuit. The bag house collects about 4½ tons of dust per day on a normal run. When the cadmium in the flue circuit builds up to a high enough percentage to warrant its recovery, the dust is sold to the Great Falls Electrolytic Zinc Plant. A steel downtake flue connects the top of the baghouse to the bottom of the stack. A 200 foot brick stack is used for the disposal of the baghouse gases. Three inventory classifications were used on metallurgical inventory for July 31, 1948. They were (1) intake, (2) pits and (3) bins and cars. A fixed tonnage (50) is used on the intake inventory. The pit inventory is reported monthly by the superintendent who estimates the inventory by observation. The car inventory is by actual weight and the bin inventories are by measurement and calculation, using a weight of about 108 pounds per cubic foot. The tonnages on the three classifications are combined and a monthly laboratory analysis on baghouse dust shipped to Sintering Plant is used to arrive at metal content. Moisture percentage for calculation of dry weight is also obtained from this sample.

Converter Flue Dust

As previously mentioned, dross reverberatory matte is treated in the old copper converters for recovery of copper content. When the converter is blowing, its spout is turned into a hood. The hood connects to a flue that carries the fume to a brick moisture chamber containing water sprays which precipitate the dust. The dust from the flue is removed by means of hoppers on its bottom, and the dust from the moisture chamber is removed manually when the accumulation is sufficient. These two items make up the Converter flue dust inventory.

Converter Cleanings

At July 31, 1948 the inventory consisted of cleanings (1) in stock pile, (2) in storage bins and cars, (3) in transit to the American Smelting and Refining Company and (4) on converter floor. The first two classes of inventory are determined by bin measurement and calculation and by report of car weights and inventories. One car had been reloaded for shipment to the American Smelting and Refining Company at Garfield, Utah, but settlement had not been received and car was retained in inventory. The Superintendent estimates the floor inventory. Metal content of all inventories is arrived at by laboratory assay. With the exception of cleanings sold the inventory is returned to the blast furnace for retreatment.

Converter Bag House Fume

Following the converter moisture chamber is the baghouse, constructed of brick and having 8 pits with 960 woolen bags. The pit bottoms are "V" shaped. A worm operates in the bottom of the "V" and removes the dust to railroad cars. The dust or "fume" is returned to the sintering plant circuit. The baghouse gases, upon leaving the baghouse, pass off to the atmosphere by means of a brick stack.

The inventory at July 31, 1948, consisted of fume at stock pile and in pits. The stock pile was accumulated in a prior month, there being no storages or removals during July 1948. The pit inventory was arrived at from data supplied by the Chief Testing Engineer. On April 5, 1948, after a period of converter blowing he measured the depth of fume in the pits, calculated the volume, obtained a weight per cubic foot (29 pounds) and a laboratory analysis of the sample. From the data as thus obtained the inventory was calculated. Since that time the converter operated during period between June 21 and June 30, 1948. The testing Engineer then obtained new measurements to arrive at the volume of fume deposited during the last run, together with a weight per cubic foot and assays on the new deposit. The weight per cubic foot was 20.5 pounds. The calculated metal content of the new deposit was then added to the prior inventory to arrive at the total July 31, 1948, inventory as used.

Lead Bullion

Lead bullion inventories usually consist of lead (1) in blast furnace (wells), (2) in kettles at drossing plant, (3) in dross reverberatory furnace, (4) metallic lead from by-products at Copper Converter building and (5) in transit to Omaha, Nebraska.

During operation of the blast furnace there is usually 15 tons of molten lead, which is carried as a constant figure. At July 31, 1948, the furnace was not in operation and no inventory was shown.

PNYC 00012265

LEAD PLANT

INVENTORIES - LEAD PLANT (Continued)

Lead Bullion (Continued)

There are four drossing kettles having a capacity of 60 tons each. By visual observation an estimate is made of the tonnage of molten lead in each. There are also two larger kettles having capacities of 120 tons each. The tonnage in these kettles is also estimated visually. Usually combined with the kettle inventories are the weights of any lead "buttons" and cleamp on the floor. Each "button" or piece of bullion weighs an estimated four tons. Cleanup consists of spillings on the floor and is estimated visually.

The dross reverberatory furnace contains a constant 60 tons when in operation. At July 31, 1948, the furnace was not in operation and had been cleaned out, having no inventory.

Lead in the converter building is from lead plant by-products and is not intended for treatment at that plant. This inventory at July 31, 1948, consisted of cleanings on the floor. Estimate of tonnage was made visually.

Lead in transit to Omaha, Nebraska consists of finished bullion billed from Tooele but not taken into receipts at Omaha. The Omaha plant sends 3 reports during each month showing the weight of bullion received, the Tooele lot numbers, the Omaha lot numbers, date received and estimated metal content. Upon receipt of the final report from Omaha sufficient information is available to determine the inventory in transit. Any cars shipped from Tooele, but not taken into receipts by the Omaha plant are carried as in transit.

Lead, silver and gold content are carried on the inventories described. Assays on silver and gold are applied to tonnages, lot numbers for which are available such as lots in transit, or "buttons" about to be shipped. Lead assay on monthly composite sample is used in determining lead content of all bullion inventories.

Converter Copper

Converter copper inventories at July 31, 1948, consisted of two classifications, (1) at Tooele and (2) in transit to Raritan Copper Works. The total inventory at Tooele consisted of 68 molds of which 3 were Lead Plant inventory, the balance being carried by the Copper Plant. On the basis of actual weight, the 68 molds have been carried at 856 pounds each. Metal content was arrived at by use of actual laboratory assays on copper from which the molds were made.

Any shipments of copper from the Tooele Plant which have not been received at Raritan Copper Works are classified as in transit inventory. The Raritan Copper Works forwards a "Metal Statement" for lots included in each months business. Any lots not included are for Tooele account.

PNYC 00012266

SLAG TREATMENT PLANT

ACCOUNTING PROCEDURE FOR SLAG TREATMENT PLANT

For purpose of determining the profitability of the Slag Treatment Plant accounting records are kept to show complete cost of material, sales and inventory valuations on the following basis:

- (1) Cost of material. The only material received at the Slag Treatment Plant during July, 1948, was slag. Cold slag is reclaimed from old dump, and either goes directly to the Slag Treatment Plant or to the blast furnace of the Lead Plant where it becomes co-mixed with the materials treated and ultimately is delivered along with current slag to the Slag Treatment Plant. The latter slag is usually termed "molten" and is the major slag introduced to the Slag Treatment Plant. To determine plant profit it is necessary to arrive at a cost of this material to the plant. Inasmuch as the purchase cost becomes a revenue or sale of the Lead Plant and also determines profit of that plant, some endeavor is made by the management to establish a transfer cost which will be reasonable for both plants. Overall profits are in no way affected by such a transfer. Metal content of cold slag is determined by actual assay. Cold slag to the Lead Plant blast furnace is also sampled and assayed. From the total molten slag delivered to the Slag Treatment Plant (tonnage determined by iron contents and assay) the tonnage of cold slag may be deducted to arrive at the molten slag produced from current treatment.
- (2) Sales. Sales of product are made on definite contract terms. During July 1948 two major products were sold to outside corporations. Leaded zinc oxide was sold through various paint companies to whom shipments were made on consignment. Reports are received from these companies monthly giving status of sales and inventories. The other product sold was delead zinc fume. Sale of this product was made outright to International Minerals and Metals Corporation, Bartlesville, Oklahoma. Contract specifies definite terms of sale. Delead zinc fume was also shipped to the American Zinc Company of Illinois under contract providing return of 80% of the zinc content of residue from that company treated in the Lead Plant. In addition to sales to outside companies some leaded zinc oxide (lead fume) is returned to the Lead Plant for further recovery of its lead. Sale is made on basis of schedule prepared by the management, accounting principle being in conformance with that outlined above for transfers between plants. Direct sales to outsiders are credited directly to sales accounts. Consignment stocks are held in inventory and are credited to sales only when remittance is received from consignees. Freight on consignment stocks are charged to "Prepaid Freight on Leaded Zinc Oxide on Consignment" and upon sale this account is credited and charge made to "Freight on Leaded Zinc Oxide." Metal content of all sales is determined by actual laboratory assay. However, all contained metal is not paid for. For example, the July 1948 sales of delead zinc fume to the International Minerals and Metals Corporation contained 57,725 pounds lead not paid for. This lead is a "sales loss." Complete record of such sales losses are kept by the Metallurgical Accounting Department.
- (3) Inventory Valuations. There are no treatment inventories carried at the Slag Treatment Plant. Cold slag is removed from the dump upon which no value is carried on the Western books. Consequently all slag delivered from the dump is adjusted by any known car or bin inventories to arrive at only the quantity treated, and none remains as plant inventory. As the tonnage of molten slag is arrived at by calculation no inventories are carried. The method of accounting in use segregates the remaining inventories into two classes, by-products and finished materials. The by-products consist of various flue, chamber and U-tube inventories and the finished materials consist of products in bins or cars ready for sale or in transit to consumers. No cost of purchase (slag cost) is carried against the by-product inventories. However, fuming plant cost is assessed to by-products on basis of cost per ton produced. The finished materials, consisting of leaded zinc oxide and delead zinc fume are not based on cost. The orthodox method would be to value these products at cost, or market whichever is the lower. Since these materials are really by-products of lead ores, no accurate cost basis is available. The lead ores were purchased for their lead content and unless arbitrary allocations of lead costs were made, no known cost of the slag treating plant products becomes available. Resort has therefore been made to market cost. Since a good market for delead zinc fume exists the inventories of that product are valued at market price. The inventory of July 31, 1948 was valued on basis of contract with the International Minerals and Metals Corporation. Leaded zinc oxide has not the same ready market as the delead zinc fume. Therefore prudence required a more conservative method of pricing, since the price on small sales to paint companies might not be a criterion for establishing inventory values. Since the major portion of this material is returned to the Lead Plant under schedule, the inventory is priced according to terms of that schedule.

RECEIPTS - SLAG TREATING PLANT

Cold Dump Slag - Reclaimed

After construction of the Slag Treating Plant a certain percentage of cold slag could be treated in addition to the molten slag from the Blast Furnace Plant. The slag is loaded at the dump in full railroad cars and weighed on track scales. The weights are recorded by the Metallurgical Accounting Department. However, the plant is assessed for only the actual tonnage treated. It is therefore necessary to prepare a statement showing the actual weight treated by adjusting the quantity loaded at the pile by inventories at first and last of month in storage bins. The bins are measured at the first of each month. The Research Department has established a weight of slag per cubic foot. From tables showing the total cubic feet in each bin at varying empty depths the tonnage of inventory is determined. To the inventory monthly assays are applied to arrive at metal content. The same assays are applied to the tonnage of slag loaded to arrive at its metal content. Having thus determined the metal content of both the slag loaded and the inventory, the quantity treated is thus determined. For transfer cost of this material refer to discussion on "Receipts - Hot Slag."

PNYC 00012267

SLAG TREATING PLANT

RECEIPTS - SLAG TREATING PLANT (Continued)

Hot Slag

In addition to receipt of cold dump slag, hot or molten slag is received from the blast furnace. This molten slag is from two sources, (1) from treatment of current material and (2) from treatment of cold slag from dump, introduced into blast furnace for melting prior to treatment at Slag Treating Plant. Pots of molten slag were at one time weighed, but this has been discontinued. At present the quantity of slag is determined by deduction. Iron and manganese content is used as a basis for this deduction. From the known iron and manganese content of material treated is deducted the iron and manganese content of materials produced, the difference being assumed as iron and manganese content of slag. By means of iron and manganese assays determined on a monthly sample, the dry tons of slag produced is arrived at.

All molten slag is sold by the Lead Plant to the Slag Treating Plant, at definite schedule is outlined by the Management for calculating this cost. Among other provisions the Lead Plant receives a \$5 credit per ton of cold slag melted. The schedule is calculated in such a manner as to allow each plant a fair profit.

SHIPMENTS - SLAG TREATING PLANT

Deleaded Zinc Fume to International Minerals and Metals Corporation, Bartlesville, Oklahoma

Deleaded zinc fume is one of the products of the deleading kiln. It is sold under contract to the International Minerals and Metals Corporation. The contract is for three years beginning February 15, 1947. The contract contains two schedules, one applicable when the price of zinc is 8.25¢ per pound or less, and one applicable when the price is over 8.25¢ per pound (Schedule II). Under the latter schedule 95% of the zinc content is paid for at 100% of the East St. Louis quotation. The base treatment charge is \$39.00 per dry ton when the zinc price is 10.5¢ per pound. For each 1¢ increase in the zinc price over 10.5¢ per pound there is added \$3.00 per ton to the base price. For each 1¢ decrease in the price of zinc below 10.5¢ there is deducted \$4.00 per ton from the base price. Contract was written when the base labor rate was \$9.672 per day. For each 10¢ increase or decrease in that rate there is added to, or deducted from the base charge 23¢ per ton. Splitting limit on zinc is .4% with provisions for repeating assays and calling for umpires.

Fume is sold F.O.B., Bartlesville, Oklahoma. After assays are exchanged, compared and repeats and umpires called for, if necessary, the International Minerals and Metals Corporation prepares the settlements and forwards them, together with paid freight bills to the Salt Lake Office of the International Smelting and Refining Company where entry is made recording revenue from sale. Combined on the same certificate with Bartlesville assays are their weights and moisture percentages. The Salt Lake Office forwards these reports, together with the freight bills and settlements to the Toledo Office where a metallurgical statement is prepared showing a tabulation of the weights, assays, metal content, charges and credits. The weight and metal content are then adjusted by deleaded fume inventories to arrive at production as used on plant metallurgical statement.

Both zinc and lead are assayed by each company, although lead is not a settlement factor. To facilitate early preparation of metallurgical statements all inventory assays are determined from grab samples. In computing metal production, however, settlement assay on zinc is used. Plant assays on lead, copper and silver govern for calculation of production of those metals.

Bookkeeping entry on sale is made at the Salt Lake Office, the International Minerals and Metals Corp., being charged and credit made to "Zinc Fume Sales."

Leaded Zinc Oxide Sales

Leaded zinc oxide is that high lead content material recovered after the zinc oxide has been discharged from the deleading kiln. The leaded zinc oxide is either returned to the wintering plant for further recovery of its lead content or sold to customers for use in manufacture of paints. Sales of leaded zinc oxide are made direct to customers or shipped on consignment to agents who report monthly on sales and inventories. Sales orders are received at the Salt Lake Office from the International Smelting and Refining Company, Pigment Department, East Chicago, Indiana, or from the New York Office. Prices are quoted by the Eastern offices and agents are allowed a commission of 1¢ per pound. During July 1948 one sale was made direct by Carl F. Miller and Company, Seattle, Washington, and consignment sales were made by C. L. Duncan Company, San Francisco, California, and Kraft Chemical Company, Chicago, Illinois.

Shipments to consignment stocks are made in 100 pound bags. The material usually assays between 50% and 55% lead and from 16% to 18% zinc, although the sales price is not calculated upon actual assay. For incorporation into metallurgical records actual assays or assays as nearly representative as possible are used in determining inventories and sales.

PNYC 00012268

SHIPMENTS - SLAG TREATING PLANT (Continued)

Loaded Zinc Oxide Sales (Continued)

The Salt Lake Office receives the shipping orders and records the entries for freight, commissions and sales. The information is then forwarded to the Tooele Office where a statement is prepared giving full detail of weights and metal content, gross revenue, freight, commissions and net revenue.

Information on consignment sales is sometimes received too late to incorporate into accounts for the month in which sales were actually made. For example the June 1948 sales by C. L. Duncan Company were reported and remittance received on July 12, 1948 after metallurgical data had been prepared. The sale was therefore recorded in July 1948 account. Also, the consignment sales are recorded directly through the cash book upon receipt of cash, such cash payments being received too late to credit to consignment sales for the month in which the sale was actually made.

Deleaded Zinc Fume Returned to American Zinc Company of Illinois

As noted under comments concerning receipt of residue from the American Zinc Company of Illinois, 80% of the zinc content is returnable in the form of deleaded zinc fume at International, Utah.

The fume is weighed and grab sampled at the Tooele smelter and assay determinations are made on the samples so obtained. Assays are obtained on zinc, lead, copper, silver and miscellaneous metals. Due to delays in shipment and settlement sampling and assaying, the assays as first obtained at Tooele are used in compiling data on metals shipped. When final weights and assays are available, adjustments are made to preliminary data.

Upon receipt at destination (Machovec, Texas, during July 1948) the American Zinc Company of Illinois obtains gross, tare and net weights and percent moisture. From the moisture sample percent zinc is also determined. After sample has been submitted to the International Smelting and Refining Company a comparison of zinc assays is made, umpires called for, if necessary and the contained zinc determined.

No provision was made in the original contract as to whose weights should govern and as to the splitting limit to be used on zinc. Reference to files in the Salt Lake Office disclosed that agreement was later effected covering these subjects. Letter of Mr. R. A. Young, Vice President of the American Zinc Company of Illinois to Mr. G. A. Burt, Ore Buyer for International Smelting and Refining Company, stated "Confirming our conversation today, the contract between our companies for return of zinc fume from the Monsanto residue currently being shipped you did not provide at which and the material is to be weighed. As per our agreement, we will use for settlement purposes weights and moisture on fume as determined at our Dumas Plant upon arrival and will send a pulp of sample to Mr. C. Bardwell at your Tooele plant. As soon as your assays are completed, please notify us of date you will expect to mail your assay and we will mail ours so as to cross in the mails. If splitting limits provided for in the contract are exceeded, we shall then resort to umpire procedure as set forth in the original contract." The original contract provides for a splitting limit of .5% on zinc which is used in conformance with the letter above quoted.

INVENTORIES - SLAG TREATING PLANT

Finished Product - Deleaded Zinc Fume

Inventory of deleaded zinc fume at July 31, 1948, consisted of (1) in transit to International Minerals and Metals Corporation, (2) on hand at plant and (3) on hand at plant but belonging to American Zinc Company under contract specifying return of zinc in form of deleaded fume.

Bills of lading are prepared showing cars shipped to International Minerals and Metals Corporation. That company, upon receipt of fume, prepares settlements on cars received during the month. Any cars for which bills of lading have been issued which are not included in receipts at Bartlesville, according to settlement statements, are considered to be in transit. The dry weight of the inventory is determined by application of moisture percentages reported by the Sampling Department. Grab samples of cars shipped provide the basis for determining assays used for calculating metal content. Content of each car is calculated and tabulation made of all cars.

Deleaded fume on hand at plant usually consists of that in partially loaded cars or in bins. The Operating Department estimates the tonnages in this category. Included in the July 31, 1948 inventory was 2 tons in "put and take" bin. This bin is used as a receptacle for storing quantities removed from over-loaded cars. At July 31, 1948 the major portion of the inventory consisted of barrings, or cleanings from the kiln. Monthly moisture percentage and assays obtained from a monthly composite sample are used in calculating the dry weight and metal content of the inventory.

PNYC 00012269

INVENTORIES - SLAG TREATING PLANT (Continued)

Finished Product - Deleaded Zinc Fume (Continued)

Contract with American Zinc Company specifies that "Zinc will be returned currently as the zinc residue due to this provision it is necessary to calculate the zinc content of residue treated by adjusting receipts by inventories at first and last of month, all calculated at 80% rate at which zinc is returnable. To the quantity due the American Zinc Company as thus arrived at is added the amount due at the beginning of the month, from which total is deducted the quantity actually delivered in fume during the month to arrive at the inventory of zinc in fume on hand, but belonging to the American Zinc Company. The amount due, although recorded as to weight and metal content, is not valued. Its content is deducted from some plant inventory, the balance of which is valued.

Finished Product - Leaded Zinc Oxide

Inventories of lead zinc oxide consist of (1) quantities consigned to paint companies and (2) quantities on hand at plant.

Commissions are granted to consignees for sale of the lead zinc oxide. Each month the consignee usually transmits a letter showing the amount sold and the inventory remaining, along with remittances of cash due. The unsold material is tabulated on metallurgical reports, metal content being calculated on the basis of laboratory assays.

Quantities on hand at plant consist of oxide in storage in pits and in full or partially loaded cars. The storage inventory consists of 100 pound bags. At July 31, 1948, there were 330 bags on hand. The inventory in cars is determined by actual scale weight, if full, or by visual observation if partially full. The inventory in pits consists of oxide underneath the bags. The pits are usually cleaned each day. They are open to observation and the tonnage is therefore estimated visually by the superintendent or truck driver.

By-Products

The by-products are classified into three divisions, (1) furnace fume, (2) lead flue cleanings and (3) furnace flue cleanings.

Furnace fume consists of that in (a) balloon flue, (b) U-tubes, (c) header flue, (d) bag house pits and (e) storage. All of this primary zinc fume is exceedingly light and bulky in character, which necessitates the handling of a very large volume each 24 hours to keep up with production. Weights per cubic foot of dust in places are as follows: U-tube cooling section - 25 pounds; bag house header flue - 20½ pounds; bag house pits - 16½ pounds. The balloon flue is thoroughly cleaned once every 8 months or year. Once a day, or every other day, the flue is tapped for removal of current material. The truck driver estimates the inventory, which at July 31, 1948, was 50 tons. The U-tubes discharge into hoppers from which the dust is removed. Some dust remains on the side walls and around the hoppers. This inventory at July 31, 1948, was estimated at 35 tons. The header flue is cleaned about every 12 days and removals made through a pit underneath. A fairly accurate estimate of the tonnage remaining is possible. At July 31, 1948, only 20 tons were carried as inventory. The bag house pits are directly below the bags which collect the fume. There are two parallel baghouses, each having 294 wooden bags 18 inches in diameter and 30 feet long. Each baghouse is divided into 7 pits of 42 bags. All of the fourteen pits are used for the zinc fume from the slag blowing furnace and a separate baghouse is used for lead fume from the kiln. The bags are shaken with mechanical shakers which raise and then drop the bag 1½ inches each revolution. The pits are about 7 feet deep. The depth of dust is estimated by visual observation. Each foot of depth contains 2 tons dust. Thus 14 pits containing dust averaging 1 ft., in depth would have an inventory of 28 tons. At July 31, 1948, the inventory was carried at 30 tons, indicating that the pits were kept well cleaned. A vacuum system is used for cleaning. Storage inventory at July 31, 1948, consisted of 73.8 tons. This inventory is determined by count of 50 pound bags of which the inventory consists. The metal content of the above described inventories is determined on the basis of fixed assays. The material is consistent in grade and is the fume highest in zinc content.

The lead flue cleanings inventory consists of fume in (a) brick chamber, (b) balloon flue, (c) U-tubes and (d) header flue. These inventories are known as secondary flue system inventories. The brick combustion chamber is 40 feet long followed by 122 feet of balloon flue, which connects to a U-tube cooling section 20 feet long and made up of 4 U-tubes. The inventory in the brick chamber may be observed and is estimated visually. As a sloping bottom is necessary some inventory is always left to facilitate passage of current material over top. The chamber is cleaned daily. At July 31, 1948 the inventory consisted of 60 tons. The balloon flue and U-tubes inventories are determined in similar manner to that described above for the primary flue system. No inventory was carried at July 31, 1948, in the header flue. It is cleaned every three months and estimation of inventory is on basis of time accumulations have been made since last cleaning date. Metal content of lead flue cleanings are determined by fixed assays.

PNYC 00012270

INVENTORIES - SLAG TREATING PLANT (Continued)

By-Products (Continued)

The third inventory classification, furnace flue cleanings, are primary flue system inventories and consist of (a) brick chamber dust, (b) steel chamber dust and (c) furnace dust. The furnace dowlake connects with a brick combustion chamber that is 80 feet long. It is equipped with water sprays which can be used to cool the gases when necessary. A series of hinged doors on each side permit the dust to be scraped out with long-handled hoes. It is cleaned about every 2 weeks and inventory is estimated on the basis of prior removals. A steel moisture chamber follows the brick chamber and is 48 feet long. It is hopper bottomed and cleaned daily or on alternate days. Occasionally the hoppers are viewed to determine inventory remaining. In addition to the chamber dust some dust accumulates around the slag furnace, is loaded into railroad cars and stored in bins. Visual estimate is made of that in cars and bin inventories are determined by measurement of bin end weight per cubic foot. Fixed assays are used for determination of metal content of chamber inventories, although monthly samples and assays are taken on furnace cleanings to determine metal content.

Considerable difference is noted between the East Helena and Tooele methods of arriving at inventory. At East Helena the Superintendent calculates daily production from known metallurgical data, and accumulates production for the month. From the calculated production deduction is made of weight of cars shipped to Great Falls, adjusted by inventories, to arrive at inventory remaining in system. The inventory as so determined was consistent with tonnages removed during shut down periods, thus indicating a good degree of accuracy in inventory calculation. The method is much in contrast with that described above for the Tooele Plant. The difference in method illustrates the difficulties encountered in determining accurate metallurgical inventories. Both methods would seem to be reasonable and superintendents of both plants indicate that tonnages are consistent and compare favorably with inventory removals during shut down periods.

PNYC 00012271

ACCOUNTING PROCEDURE FOR SULPHIDE CONCENTRATOR

Similar to procedure on Lead and Sleg Treatment Plants all accounting data is kept to arrive at profits as nearly as possible. Except for depreciation expense all costs are available for determination of profits. Revenues, however, are dependent upon schedules as provided by the management, transfers of lead and iron concentrates being made to the lead plant on that basis. The description below briefly details features on (1) receipt and cost of materials, (2) shipments and sales of products and (3) inventories and their valuation.

(1) Receipt and Cost of Materials

Materials for treatment consisted during July 1948 entirely of crude lead-zinc ores. Of ten shipments received nine contained a greater average percentage of lead than zinc. The purchases are made under contract provisions or open schedule by the Ore Purchasing Department of the Salt Lake Office, and payments are made by that office directly to the shippers. Cost of ore is entered on the general books and is kept separate and distinct from cost of ore purchased for the lead plant. No materials were received during July 1948 from the Lead Plant.

(2) Shipments and Sales of Products

There are three customary products sold or transferred. They are (a) lead concentrates, (b) zinc concentrates and (c) iron concentrates. The lead concentrates are all transferred to the lead plant under schedule provided by the management. Total production is transferred, that is, any inventories remaining at the end of a month are purchased by the Lead Plant and are included as a part of its inventories. Bookkeeping entry is made by the Salt Lake Office crediting the Sulphide Concentrator and charging the Lead Plant with the value of the transfer. Zinc concentrates are all disposed of to the Montana zinc plants of the Anaconda Copper Mining Company. The Salt Lake Office prepares the entry charging the International Smelting Company, New York Office, and crediting Zinc Concentrates Sold to Anaconda or Great Falls. Sale of iron concentrates to the Lead Plant is made in manner identical to that above described for lead concentrates.

(3) Inventory Valuations(a) Ore at Stock Pile

Ore at stock pile is carried at cost with the exception of the silver and gold content which are valued at 34.75¢ and \$34.00 per ounce respectively, as per instructions. As noted under comments on "Inventories - Ore in Stock Pile" the additions are made to the pile in full lots and calculations on value of ore by lots is made from data on ore settlements. Removals from the pile are made at the average of the "to account for" quantities, both as to metal content, metals paid for, value of metals and treatment charges. Small piles are usually carried and are cleaned up frequently. Usually a pile is cleaned up entirely, as the plant is operated in campaigns when a sufficient supply of ore has been accumulated. Partial removal of piles is an exception to usual practice. No last-in, first-out method of inventory valuation is applied as inventories are frequently cleaned up and total cost is carried against production.

(b) Ore in Bins

Record is kept as nearly as possible of bin inventories by lots. Under the method used in operating the concentrator; i.e., in campaigns, the content of the bins is generally ascertainable by lots. Complete cleanups are made during periods of operation, and accumulations begin for the next operation. By reference to dump reports the lot numbers of ore stored is obtained. Tabulation of the inventory is then made by lots and the dry weight, metal content, metals paid for, revenues and treatment charges are calculated from settlements. The silver and gold, however, are changed to 34.75¢ and \$34.00 per ounce respectively. As with stock pile ores no last-in, first-out method of valuing the other metals is used.

(c) Concentrates on Hand and in Transit

Concentrates on hand are finished product and are therefore not worked back to an original equivalent. The inventories are therefore priced at market value which at July 31, 1948, was the price obtainable under contract with the Anaconda Copper Mining Company. All revenues, treatment charges and freight on concentrates on hand July 31, 1948, were calculated on the basis of that contract.

PNYC 00012272

RECEIPTS - SULPHIDE CONCENTRATOR

Contract Provisions - General

Concentrating ores are purchased under specific terms as provided by contract or open schedule. Of the large numbers of ores received during July 1948 two were audited in detail, those of the Park Utah Consolidated Mines Company and leasers of the National Tunnel and Mines Company. Typical of contracts for milling ores is that with the former company. For informative purposes the terms are herewith summarized:

Payment for Metals:

Gold	Pay for 70% up to and including .05 ounces per ton at \$32.816 per ounce. Pay for 80% if over .05 ozs., at \$32.816. Minimum deduction is .01 oz., per ton.
Silver	When 15 ounces or under, pay for 83% at Mint Price. When over 15 ozs., pay for 90% of the excess over 15 ounces at Mint Price. Minimum deduction .5 ozs.
Copper	Pay for 70% at New York electrolytic price less 6.3290¢. Minimum deduction 15 pounds per ton.
Lead	Pay for 83% less 2.4220¢ per pound. Minimum deduction 20 pounds per ton.
Zinc	Pay for 65% less 2.9106¢ when zinc is 5¢ per pound or less. To this deduction of 2.9106¢ add .4¢ per pound for each 1¢ increase in price of zinc over 5¢. Minimum deduction 60 pounds per ton. Monthly average on minimum deduction if beneficial to shipper (per A. B. Young 4/16/43).

Treatment:

Charge \$1.24 per dry ton when sampled by the Utah Ore Sampling Company. If not sampled by the Utah Ore Sampling Company, charge 25¢ per dry ton.

Bullion Freight - Metal price deductions based on copper and lead bullion rate of \$19.08 and \$12.76 for zinc. Any increases or decreases are for account of the shipper.

Splitting Limits:

Gold	.02 oz., per ton
Silver	.5 oz., per ton
Lead	.5%
Copper	.3%
Zinc	.5%

Ores from Park Utah Consolidated Mines Company

Ore from Park Utah Consolidated Mines Company is from two locations, Park City, Utah, and Kestley, Utah. This ore is sampled by the public sampler, the Utah Ore Sampling Company. According to the contract the International Company allows a credit of 25¢ per dry ton to the Park Utah Company for sampling concentrating ores, the latter company bearing the full cost of sampling by the Utah Ore Sampling Company. The full cost is paid by the International Company which deducts the amount from the proceeds of ore due the Park Utah Company.

The Utah Ore Sampling Company weighs each car gross and tare, and obtains the percent moisture. The weights and moisture percentage are accepted by the International Company. However, the ore is weighed heavy and light upon its receipt at the Tooele Plant, a check thereby being obtained on the weight. The Salt Lake Office reports the weight and moisture percentage to the Tooele Office for use in tabulating the receipts. Settlement assays are arrived at in the usual procedure by averaging sellers and buyers assays with use of umpire assays when splitting limits have been exceeded.

PNYC 00012273

SULPHIDE CONCENTRATOR

RECEIPTS - SULPHIDE CONCENTRATOR (Continued)

Ore from Park Utah Consolidated Mines Company (Continued)

Park Utah ore is usually purchased for the Sulphide Concentrator. However, there are occasional lots sufficiently high in lead content to be used in the lead smelter. Two schedules are in effect for the purchase of Park Utah ores, one for concentrator ore and one for smelter ore. Even though an ore may not be of the proper analysis for treatment in the smelter, it may be settled for on the lead smelter schedule, if by that schedule the settlement is advantageous to the shipper. Of seven lots received from Park City during July 1942 three were purchased under terms of the lead-zinc schedule and four under the lead smelting schedule although all seven lots were actually treated at the concentrator.

During July 1948 concentrator ore was received from nine shippers. Of the nine only two sent their ore to the Utah Ore Sampling Company, the Park Utah Consolidated Mines Company and the Bar X Mining Company at Jericho, Utah.

Contract with the Park Utah Company contains a provision for use of a monthly minimum deduction calculation on zinc. The contract provides payment for 65% of the zinc content at a specified price with a minimum deduction of 60 pounds per ton (3% assay). If 35% of zinc content (not paid for) is less than the poundage not paid for on a 3% deduction from assay, then the greater amount, or 3% of dry weight, is not paid for. Likewise if the 35% of zinc content exceeds the 3% of dry weight not paid for, then the higher pounds zinc at 35% is not paid for. According to the contract each lot is settled for separately and the minimum deduction applied to each lot. On April 16, 1943, Mr. A. B. Young conceded that a minimum deduction be calculated, based on a monthly average zinc assay. If the monthly calculation results in a lesser number of pounds not paid for than the sum of the pounds not paid for by lots, then the Park Utah Company would be reimbursed for the additional pounds zinc. However, if the calculation resulted in an additional poundage of zinc not paid for no penalty would be assessed against the Park Utah Company. Stated otherwise, the monthly calculation is used only if beneficial to that company.

Ore from the National Tunnel and Mines Company

Ore from the National Tunnel and Mines Company is from a lessee of that company (Frank De Ronch). Receipt of ore and accounting procedure is identical to that described under "Receipts - Lead Plant - Ore from Combined Metals Reduction Company."

The ore is purchased under open schedule terms. One settlement provision varies somewhat with others as audited for July 1948. Certain of the ores in the National Tunnel property are oxidized. As such oxide ores are not amenable to the concentrating process, the oxides of lead and zinc are assayed and such assays deducted from the total assay of each metal before payment is made.

The National Tunnel and Mines Company is in the process of bankruptcy and no ores are being mined other than that of lessees.

SHIPMENTS - SULPHIDE CONCENTRATOR

Zinc Concentrates Shipped to Anaconda Copper Mining Company, Anaconda, Montana

Zinc concentrates are shipped to either or both of the electrolytic zinc plants of the Anaconda Copper Mining Company in Montana, one being at Anaconda and the other at Great Falls. Present settlements are based on letter agreement dated January 1, 1945. Whether or not concentrates are shipped to Anaconda or Great Falls, the International Company is obligated to pay freight to Great Falls (Black Eagle). Agreement specifies percentages of metals paid for, prices to be used and base treatment charges with adjustments thereto. One unusual feature of this agreement is that the zinc price to be used is not that quoted by the Engineering and Mining Journal, but the price received by the Anaconda Copper Mining Company, f.o.b., its Montana Plants, for zinc sold and delivered by Anaconda during the month of receipt of the concentrate, less .30¢ per pound, plus freight on zinc from Montana zinc plant to St. Louis, Missouri. The original agreement did not specify any increase or decrease in base treatment charge due to increases or decreases in labor rate. In letter of Mr. R. E. Dwyer, November 5, 1947, provisions were made for such changes in treatment charge. Any increase or decrease above or below \$10.50 per day labor is to be compensated by addition or subtraction as the case may be, of 1.2¢ per dry ton to the base treatment charge for each 1¢ per day increase or decrease in cost of labor above or below said \$10.50 per day. Anaconda weights are used in making settlement and date of weighing at Anaconda is official date received. To record the transaction the Salt Lake Office charges the International Smelting and Refining Company, New York, and credits "Zinc Concentrates Sold to Anaconda."

PNYC 00012274

SULPHIDE CONCENTRATOR

SHIPMENTS - SULPHIDE CONCENTRATOR (Continued)

Lead Concentrates and Iron Concentrates to Lead Plant

Sulphide Concentrator did not operate during July 1948 and no transfers of lead or iron concentrates were made to lead plant. When plant is operating, transfer of these products is made to lead plant on basis of schedule provided by the management. Zinc concentrates, discussed above, were in transit at June 30, 1948, and received in Montana during July 1948 in which month revenue from sale was taken into account.

Zinc Concentrates Lost in Transit between International, Utah, and Anaconda, Montana

The Traffic Department at the Anaconda Reduction Works compares its weights of zinc concentrates with those of International to arrive at a basis for establishing freight claims. The Traffic Department at Butte, Montana, is advised of losses and from information supplied by the Accounting Department files claims with the railroad. During July 1948 one such claim was collected. Prior to collection of such claims the Metallurgical Accounting Department makes no adjustment for these losses on statements of treatment and production. Some variation always exists between shippers and consignees weights and are absorbed as loss or gain in preparation of statistics. However, when cash collection for loss is made, the metal content of such losses are recorded to adjust plant recoveries, and revenue is entered upon the books of account. During July 1948 a collection was made by the Butte Traffic Department, a copy of the claim being forwarded to the Salt Lake Office. The following entry was made:

Dr. International Smelting and Refining Co., New York Office

Cr. Zinc Concentrates Lost in Transit to Anaconda

The credit is in reality a sale.

INVENTORIES - SULPHIDE CONCENTRATOR

Ore in Stock Pile

Each day a "Daily Car Report" is prepared by the Operating Department showing car numbers of ore dumped at stock piles. These car numbers are then checked to report "Record of Milling Ore Received" which gives the gross, tare and net weights of the car and its lot number. Having thus secured the lot number, the car may be identified on the Abstract of Ore Received which gives all details as to weight and metal content. The lots which have been stored are then posted to a summary or disposition statement where totals are kept by shippers and by piles to which ore has been stored. The various storages are then posted to a "Record of Stock Pile Ore" which contains a summary of the inventories, receipts and removals of stock pile ores.

Practice in handling removals is different from that used on lead plant stock pile ores where samples were obtained and assays determined. Since most of the Concentrator Plant ores are stored for relatively short periods and the piles are entirely cleaned up during periods of operation, no assays on removals have been made. When a pile is partially removed the dry weight and metal content are deducted at the average carried in the inventory.

Ore in Bins

Two methods of determining bin inventories are possible. One method is by measurement of bins and calculation of inventory by multiplication of cubic feet full by weight per cubic foot of material. The other method is to arrive at the inventory by accurate scale weights on additions and removals. A modification of the latter method was used for July 31, 1948, inventory in bins. The Concentrator does not operate continuously. The Operating Department usually puts on its campaigns during the middle of the month at which times whole pile or bin inventories are removed to treatment. Thus during July 1948 a large quantity of ore was placed in empty bins and plant did not operate during the month. The inventory of these bins was therefore determined by reference to dump reports showing what lots entered the bins. The weights and metal content of these lots was then obtained from settlements or abstracts of ore received. To the inventories as so obtained were added bin inventories still remaining from July 1, 1948.

Zinc Concentrates on Hand and in Transit

At the first of each month the Superintendent of the Sulphide Concentrator submits a letter detailing various ores on hand in bins and at plant. The clerk preparing metallurgical statements compares the lots reported on hand in bins with his own record obtained from dump reports. Any other inventories, including concentrate in Tooele Valley Railroad cars are reported by the Superintendent. If no sample is taken the best available moisture and assays are used to obtain the dry weight and metal content.

The inventory of cars in transit is determined from bills of lading and letters received from the consignees, the Montana zinc plants. Each month the Montana plants send letters of transmittal with pulp samples stating the car numbers and weights of cars taken into their months receipts. Any cars shipped from Tooele and not received at the Montana plants are carried as inventory in transit. The cars are sampled at Tooele by lots (approximately 10 cars to a lot) and assays are obtained from the samples taken. These assays provide the means for obtaining metal content of the in transit inventory.

PNYC 00012275

ERRORS AND DISCREPANCIES

SHIPMENTS - COPPER PLANT

Furnace Bottoms to the American Smelting and Refining Company

Letter agreement on sale of furnace bottoms provides:

"Arsenic: 3% free; charge for excess at 25¢ per unit. Maximum arsenic penalty \$3.00 per ton. However, if the arsenic content is 16% or over, there will be no penalty."

Lot No. 15, settled for during July 1948 contained 15.70% arsenic. After deducting the 3% free, the penalty would calculate to \$3.18 (12.70 units @ 25¢ each). This penalty was used on the settlement submitted by the American Smelting and Refining Company in contradiction to the provision above stated calling for a maximum penalty of \$3.00 per ton. Mr. G. A. Burt, Ore Buyer, stated that he would write to the American Smelting and Refining Company requesting an adjustment. The adjustment in favor of the International Smelting and Refining Company should be for \$12.52 (18¢ per ton on 69,5565 dry tons).

SHIPMENTS - SLAT TREATING PLANT

Freight Bills on Deleaded Fume to International Minerals and Metals Corporation

Freight bills on two cars of deleaded fume shipped to the International Minerals and Metals Corporation included errors in tabulating weights. Detail of weights appearing on freight bills and comparison with Toole weights is as follows:

			<u>Bartlesville</u>	<u>Toole</u>	<u>Difference</u>
Car No.	CMD 88437	Gross	188,120	189,840	
Lot No.	1735	Tare	48,340	48,680	
		Net	139,780*	141,160	1,380
Car No.	FLK 2236	Gross	106,260*	207,200	
Lot No.	1736	Tare	30,440	160,620	
		Net	146,240*	146,580	340

*Bartlesville net weight on car CMD 88437 should be 139,880 providing no typographical errors were made in recording gross and tare weights. Gross and tare weights as used on car FLK 2236 are unexplainable, although the net weight as reported is very close to that reported by Toole.

The Salt Lake Office was questioned concerning the above errors. Statement was made that if the net weights as reported by Bartlesville were comparable with those of Toole, they were accepted. However, if apparent shortages occurred in substantial amounts, investigations were made of such shortages.

RECEIPTS - SULPHIDE CONCENTRATOR

Base Bullion Rate for Determining Lead and Copper Payments on Park Utah Consolidated Mines Company Contract

Contract provides that any increases or decreases in the lead and copper bullion rates shall be for the account of the shipper. On April 20, 1935, the bullion rate was increased from \$12.50 to \$13.00 per ton. The contract of October 31, 1935 specified the \$13.00 bullion rate. However, all settlements are calculated using the old \$12.50 rate as a base. No explanation could be given regarding the use of the lower rate. Its use results in reduced payment to the shipper of .025¢ per pound of lead or copper paid for. Mr. G. A. Burt, Ore Buyer, expressed the opinion that in view of the small amount involved and the long period of time over which the \$12.50 rate was used, no adjustments or corrections be made and use of the \$12.50 rate be continued.

PNYC 00012276

GENERAL REMARKS

SHIPMENT OF MATERIAL - COPPER PLANT

Reverberatory Furnace Bottoms to American Smelting and Refining Company

Letter agreement with the American Smelting and Refining Company does not provide for splitting limits or umpire assays. Mr. Scanlon of the Ore Purchasing Office at Salt Lake stated that the procedure used in arriving at settlement assays was to obtain the American Smelting and Refining Company assays, make comparison of its assays with the Tooele assays and call for umpires on those assays too far out of line. If umpires were called for, the middle assays were used; otherwise the assays of the American Smelting and Refining Company were used. On lot 15, settled for in July 1948 the Tooele Assay Office reported original and duplicate assays. Detail of assay data for settlement is as follows:

	Tooele		A.S. & R. Co.	Umpire	Settlement	
	Original	Duplicate				
Copper	11.7	11.7	11.75		11.75	A.S. & R. Co.
Lead	4.2	4.2	3.5		3.5	A.S. & R. Co.
Silver	7.2	7.3	6.42	7.65	7.25	Average Tooele
Gold	1.31	1.30	1.25	1.27	1.27	Middle (Umpire)
Insoluble	28.8	29.0	27.2		27.2	A.S. & R. Co.
Iron	16.9	16.9	17.1		17.1	A.S. & R. Co.
Zinc	0.7		1.0		1.0	A.S. & R. Co.
Arsenic	15.7		14.94	16.15	15.7	Middle (Tooele)
Antimony	2.4		3.1		3.1	A.S. & R. Co.
Nickel	6.4		7.3	8.2	7.3	Middle (A.S. & R. Co.)

The settlement assays are therefore arrived at by review of assays without definitely defined limits. The procedure would appear to be rather loose, but inasmuch as the material is hard to dispose of due to its impurities the lack of definite limits may be condoned as a concession necessary to making sale. Any changes in the above method are at the discretion of the management.

RECEIPT OF MATERIAL - LEAD PLANT

Received Dates

As noted under comments on receipt of ore and concentrates from Combined Metals Reduction Company, the factors determining the quantity taken into receipts are (1) availability of silver affidavit and (2) availability of data necessary to enable clerical force to report plant profits by the 12th of each month. Contracts governing purchase of various ores usually specify date of receipt at Warner Junction or date of sampling as a basis for metal payments.

The above practice in determining receipts for the month varies somewhat from practices of Anaconda Copper Mining Company plants in Montana where date of receipt is usually date material is weighed. However, the point of receipt in Montana is the plant itself where the material is weighed, whereas at Tooele the point of receipt is Warner Junction, between six and seven miles from the plant. Some delay might occur between receipt of ore at Warner and weighing at the smelter. Sampling may again be delayed for some time after weighing. Illustrative of the lapse of time between receipt of cars at Warner and time of sampling and settlement is the following data on Combined Metals Reduction Company ores:

Lot No.	Date of Receipt	Date of Sampling	Date of Settlement	Mo. Business
5175	7/22/48	7/27/48	8/4/48	July 1948
5181	7/23/48	7/28/48	8/13/48	August 1948

From this data it may be observed that both lots were received and sampled in July 1948 although one was officially received in July 1948 and the other in August 1948. It may also be noted that the settlement for lot 5175 was prepared in time to facilitate closing of July 1948 accounts. Although preliminary settlements might be used to facilitate early closing this would involve considerable extra clerical work and in reporting affidavit silver would also require more statements. When affidavit silver is not involved preliminary settlements have been made. Thus in receipts of residue from the American Zinc Company of Illinois, silver in which is non-affidavit, shipper's assays are considerably delayed and preliminary settlements are made to facilitate closing. Typical data on American Zinc Company is as follows:

Lot No.	Date of Receipt	Date of Sampling	Date of Preliminary Settlement	Date of Final Settlement
5193	7/22/48	7/30/48	8/6/48	8/30/48

From this it may be noted that closing could not be deferred until availability of final data. Adjustments are made for final settlement in the month following.

PNYC 00012277

GENERAL REMARKS

RECEIPT OF MATERIAL - LEAD PLANT (Continued)

Received Dates (Continued)

Discussion with Mr. W. H. Floyd indicated that instructions have been received to effect absolute agreement between silver affidavits and receipts as shown on metallurgical statements. Thus, to report silver on basis of preliminary settlements would involve preparation of reconciliation statements showing adjustments to preliminary ounces silver included in receipts. Such reconciliation statements are presently being made by the Montana Plants.

The main difficulty and objection to determining receipts as above noted is that lots of ore may already be in smelter storage bins, but excluded from receipts because of unavailability of silver affidavits or settlement assays. Adjustments in these cases are made to inventories as required. For detail on inventories see further under "General Remarks - Inventories of Original Material."

Inasmuch as the receipts are determined on the basis of practicability rather than upon fixed dates, any change in present procedure would invariably cause more delay and inconvenience in closing. In view of that no recommendations are here made to change present procedure.

Repeat Assays on Combined Metals Reduction Company

Contract between the International Smelting and Refining Company and the Combined Metals Reduction Company states "Certificates of assay showing all assay results shall be exchanged. If the assays shall check within the limits of variation herein stated, the average of the two assays shall govern settlement. If the assays do not check within said limits, at the option of either party, a sample pulp shall be submitted to an umpire agreeable to both parties and the decision of such umpire shall be final if his assay falls between the other two assays. If the umpire's assay is above the higher assay or below the lower assay by an amount greater than the splitting limit (listed below), then the umpire pulp shall be submitted to another umpire whose result shall be final if his assay falls between the two assays of the contracting parties. When an umpire assay is above the higher or below the lower assay by an amount not exceeding the splitting limits then the assay of the party nearest the umpire's assay shall be taken for final settlement."

It is noted that if the assays do not check within the prescribed limits a sample shall be submitted to an umpire at the option of either party. Contracts between the Anaconda Copper Mining Company and other companies relative to sales or purchases of ore in Montana do not contain such an optional provision, umpires being required when assays fall outside the prescribed splitting limits. Comparison between the companies' practices is here mentioned only informatively. However, considerable variance from contract provisions was noted in use of assays pertaining to purchase of ores from the Combined Metals Reduction Company. If the original assays do not fall within the prescribed limits, either by verbal agreement, or by assumed privilege, repeat assays are reported by each company. Providing the assays still exceed the splitting limits an umpire is requested. If the umpire assay is then lower than the lowest assay, or higher than the highest assay by more than the splitting limit, a repeat umpire is requested rather than submission of sample to a different umpire assayer for analysis.

It was noted that an unusually large number of assays are repeated. Such a situation would seem to indicate that each company feels out the other in first assays reported, and by resort to repeat assays arrives at a settlement basis. Whether or not the assays are actually repeated, or reports merely changed is problematical, and not within the province of this audit. Typical of the practice are the following assays on lot number 5087, received during July 1948:

	Original		Repeat		Umpire	Actual Settlement	Settlement by Eliminating Repeat
	Int'l.	Combined	Int'l.	Combined			
Copper	.70	.95	.70	.9		22.8	1.825
Lead	42.4	42.6				42.5	42.5
Silver	41.15	41.94	41.30	41.74	41.34	41.34	41.34
Gold	.05	.067	.05	.063	.06	.06	.06
Insol	14.9	14.6				14.75	14.75
Iron	6.4	6.8				14.6	14.6
Sulphur	14.7	13.5	14.7	14.8		14.75	14.1
Lime	3.9	4.2				4.05	4.05
Zinc	5.4	4.9				5.15	5.15
Manganese	Tr.	.2				1	1

Observation is made that with the exception of sulphur, use of averages on original assays or with umpires as required would give substantially the same settlement results. Uniformity of results, however, is not implied on all lots. The above lot was chosen at random.

PNYC 00012278

GENERAL REMARKS

RECEIPT OF MATERIAL - LEAD PLANT (Continued)

Repeat Assays on Combined Metals Reduction Company (Continued)

Mr. G. A. Burt, Ore Buyer, was consulted regarding the use of repeat assays. He stated that due to wide discrepancies between buyers' and sellers' assays agreement was reached verbally or otherwise to repeat assays to obtain less variance. No written agreements were available and admission was made that the letter of the contract was not being followed.

For informative purposes the present practice has been reviewed. Considering that the contract, written as recently as May 24, 1948, does not specify use of repeat assays, it would seem that their use by the Ore Purchasing Department should be approved by those representing the parties to the contract. If approved, such approval, in writing, should be obtained and filed for reference.

Use of the practice above described was discussed with Mr. Rom Warburton who stated that he would confer with the Operating Department and report his findings to the Auditing Department.

Limits of Variation of Assays - Combined Metals Reduction Company

Contract with Combined Metals Reduction Company states "Assays must agree within the following limits:"

Gold	.01 of an ounce
Silver	.2 of an ounce
Copper	.2 of 1%
Lead	.3 of 1%
Insoluble	)
Iron	)
Manganese	)
Lime	.5 of 1%
Sulphur	)
Zinc	)
Arsenic	)
Antimony	)

Audit revealed that these limits were not adhered to with the exception of those on copper and gold. Those in use are as follows:

Gold	.01 of an ounce
Silver	.3 of an ounce
Copper	.2 of 1%
Lead	.4 of 1%
Zinc	.5 of 1% when assays exceed 10%, otherwise 1%
Others	1.0%

The use of limits other than those specified by contract was called to Mr. G. A. Burt's attention. As with the use of repeat assays as previously discussed, Mr. Burt stated that the use of limits other than specified by contract was the outgrowth of experience of prior years in eliminating a large number of unpires. Contract provision specifying that assays must agree within certain limits would indicate that the parties thereto were not informed as to the limits actually applied. Some clarification should be sought, by revision of the contract or otherwise, to effect agreement on the use of proper assay limits. Mr. Burt agreed here also, that the letter of the contract was not being followed.

Report of the above practice was made to Mr. Rom Warburton who stated he would also confer with the Operating Department on the matter and report to the Auditing Department.

SHIPMENTS FROM LEAD PLANT

Converter Copper Lost in Transit to Raritan Copper Works

As noted under comments concerning shipment of converter copper to Raritan Copper Works, five pieces were lost from car NYC 133798 shipped on June 28, 1948. The following data shows the loss in pieces and weight:

	Number of Pieces	Weight
Shipped from Tooele, Utah	336	710,850
Received at Raritan, New Jersey	331	103,903
Loss in Transit	5	21,717

On August 12, 1948, Mr. W. H. Floyd, Chief Clerk, submitted the above data to Mr. Rom Warburton. Mr. Warburton advised that he in turn submitted the data to the New York Traffic Department for claim purposes.

PNYC 00012279

INVENTORY VALUATIONS - LEAD PLANT

Valuation of Gold

Tabulation of gold cost is made for all lots carried in inventory. The ounces paid for, however, are not tabulated, but calculated in total, based on a \$34.91 price. After the number of ounces paid for is thus calculated the value in inventory is calculated at \$34 per ounce. For example, only 10 lots of ore in bins at July 31, 1948, the gold cost was actually \$3,390.09. No tabulation of the ounces paid for was made, some contracts specifying 91% at \$35.00, some 100% at \$31.816 etc. Rather than show ounces paid for at an odd average price per ounce, and to consistently show a price of \$34.91 (government price less marketing cost). Mr. Floyd states all gold paid for at that price. Therefore \$3,390.09 is divided by \$34.91 to arrive at 97.109 ounces paid for, which will admittedly differ by small amount from actual ounces paid for. The inventory of 97.109 ounces is then valued at \$34.00 or \$3,301.71. In preparing estimated profit and loss statement Mr. Floyd found that less confusion resulted by consistently showing gold revenue at \$34.91 per ounce, preferring to hold that figure constant and make the ounces paid for variable. The practice, as above stated, is used on inventory data.

Sampling Ore Cost

Ore received at the Lead Plant is sampled before treatment for determination of purchase cost and for control of metallurgy. At July 31, 1948, there were 19,266 tons sampled ore in stock pile against which no sampling cost was carried. Mr. Floyd stated that (1) the original sampling had served its purpose in providing data from which settlement could be made, (2) the ore would have to be resampled upon treatment, and (3) the ore was worth less in the stock pile than in a bin or car due to cost of reclaiming. For these reasons the original sampling cost was allowed to "wash through" none being carried against inventory. Mr. Floyd stated that he had received verbal approval of this practice from Mr. E. O. Sowerwine.

Following the practice of the Lead Plant, no sampling cost is carried in stock pile inventories of the Sulphide Concentrator.

RECEIPTS - SULPHIDE CONCENTRATOR PLANTContracts with Park Utah Consolidated Mines Company

Two contracts are in effect between the International Smelting Company and the Park Utah Consolidated Mines Company. One is for the purchase of lead ores for smelting and originated June 1, 1926. The other, for the purchase of lead-zinc ores for the concentrator has been in effect since October 31, 1935, and is a rather informal letter agreement. Perusal of the files containing the contracts and correspondence between the two companies revealed that most terms and conditions as agreed upon are at present being used in calculation of settlements. Subjects upon which no correspondence was found are as follows:

(1) The payment for zinc content is adjusted for bullion freight rate. Although the original agreement did not specify a base bullion rate the base rate presently being used is \$8.50 per ton.

(2) Payment for gold under the lead smelting contract is for 100% at \$31.816 per ounce if assay is .01 ozs., per ton or over. No correspondence was available on agreement to use \$31.816 per ounce, although its use is prevalent in the Salt Lake District. Method of arriving at this price is as follows:

Government price less cost of delivery	\$34.91
Less old Government price	20.67
Differential	\$14.24
At 90% paid for	\$12.816
Add \$19 as provided by contract	\$19.000
As used	\$31.816

(3) Lead smelting contract synopsis as used by the Ore Settlement Department contains a provision relative to sampling by the Utah Ore Sampling Company. Provision is that when the shipper elects to have its ore sampled by the Utah Ore Sampling Co., a credit of 25¢ per ton is allowed on treatment charge. Otherwise an additional 50¢ per ton is to be charged by the International Smelting and Refining Company for the sampling. Letter agreement covering this provision was not available. Present practice of the Park Utah Company is to have its ore sampled by the Utah Ore Sampling Company and receive the 25¢ credit as above stated.

(4) Original lead smelting contract provides for a .25% splitting limit on copper. Splitting limit being used is .3%. Remarks pertaining to splitting limits used on Combined Metals Reduction Company ores are also here applicable.

PNYC 00012280

RECEIPT OF MATERIAL - LEAD PLANTMonthly Zinc Penalty on Receipts of Ores from Combined Metals Reduction Co.

Contract provides that when zinc is not paid for all zinc in excess of 5% shall be charged at the rate of 25¢ per unit and at the end of the calendar month such lots, in which no zinc is paid for, shall be averaged and the average penalty applied thereon. During July 1948 settlement lot 5138 received from Combined Metals Reduction Company, Willis Smith Lease, was settled for under terms of contract with that company. However, in making monthly adjustment on zinc penalty that lot was omitted. Explanation of the Ore Settlement Department was that the contract specified purchases only from the Calumet, Butterfield and Castleton Mines and the Ploche and Bauer Flotation Concentrators and that lot 5138 was not included in this group. Exclusion of this lot was to the advantage of the International Smelting and Refining Company, less refund being required on previously excessive zinc penalties charged due to lot having only a .4% zinc content. Acceptance of settlement by the Combined Metals Company would infer that contract had been interpreted correctly.

Adjustment to Base Treatment Charge due to Change in Coke Price

Price of coke increased on July 16, 1948, requiring an addition to the base treatment charge as used on settlements. Settlements represented by lot numbers 5144, 5145, 5146, 5147 and 5154, ore for which was all reported sampled after July 16, 1948, did not include increased treatment charge. Since the contract specifies point of receipt as Warner Junction, audit of reports of ore received at that place indicated that all cars in the above lots were received prior to July 16, 1948 and not subject to adjustment. Received dates were not shown on settlements. Settlements as submitted were properly calculated.

INVENTORIES - LEAD PLANTCost to Finish Lead Bullion Inventories

Statement is prepared monthly arriving at lead bullion production by adjusting deliveries to Omaha by inventories at Tooele and in transit to Omaha, Nebraska. Costs of refining lead and bismuth, and freight to Omaha are also calculated for lead bullion produced. Inventory costs are estimated on basis of content as determined by Tooele assays. Refining and freight costs on inventories appearing on the production statement have therefore not been incurred. Estimate of these costs is similar to that prepared by the Great Falls Office of the Anaconda Copper Mining Company in determining "cost to finish" in process refinery inventories. Assumption is that reserves are set up by the New York Office to adjust the inventories to actual value.

Included in the same category as cost of refining lead and bismuth is "cost of finishing lead in wells." The New York Office values the lead bullion inventories, included in which is the tonnage of molten lead in drossing kettles or "wells." Since the cost of drossing is taken into account on Statement of Cost, Treatment, Production and Losses, that statement should show actual cost of producing bullion. However, lead in kettles, although included in bullion inventory is not finished production as it requires further drossing. The estimated drossing cost is deducted by the Tooele Office from the value of in process inventories, automatically raising cost of producing bullion, although the expenditure has not yet been made. It is assumed that the New York Office makes further account to counteract the increased cost as shown by the Tooele statement.

Weights per Cubic Foot on Material in Storage Bins - Lead Plant

Weights per cubic foot are used in determining tonnage in bins after volume of bins have been determined. These weights per cubic foot are reported by the Chief Testing Engineer, or in some instances the Sampling Department obtains weights when sampling the material. All weights per cubic foot as used on July 31, 1948, inventories were not identifiable on weight tables. Explanation was that materials in inventory do not always conform in weight and other characteristics with the samples upon which original weights were determined. For example on November 1, 1943, weights were obtained on two classes of Bristol ore, one weighing 108 pounds per cubic foot and the other 126 pounds per cubic foot. Recent receipts of Bristol ore are not classified into different types. Weight of a cubic foot from a car recently received was 104.9 pounds. The clerk preparing the inventory statements used an estimated 110 pounds in arriving at inventory of Bristol ore in bins, as well as for other miscellaneous inventories. In instances where exact scale weights are obtainable for comparison with calculated weights a fair degree of accuracy was noted. The following July 1948 data is illustrative:

	Calculated Weight	Scale Weight
Bin No. 5 - Forehearth Material	300,620	308,420
Bin No. 29 - Bristol Ore (Weight of one lot assumed to equal inventory)	138,500	121,780
Bin No. 40 - Miscellaneous Ore	208,900	209,920

Conclusion is that the Metallurgical Accounting Department is doing the best it can with the data available.

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INVENTORIES - LEAD PLANT (Continued)

Sintering Plant Flue Dust

This flue dust falls under the classification "Sintering Plant Cleanings, etc.," on the monthly metallurgical inventory report. Fixed tonnages as reported by the Research Department are used by the Metallurgical Accounting Department for inventory purposes. Since there is some monthly accumulation in the dry flue a fixed inventory does not represent as accurate an inventory as possible. At July 31, 1948, this inventory was carried at 176,000 pounds. Inquiry was made of Mr. B. O. Loken, Testing Engineer, regarding accumulations of dust in this flue. He stated that in his calculations he was presently accumulating flue dust at the rate of 198 pounds per sintering machine day. Mr. Floyd thought that 175 pounds per day would be conservative figure to use, as prior weights per machine day averaged from 100 pounds to over 200 pounds. Calculated on this basis since the last flue cleanup at November 1, 1947, the inventory at July 31, 1948, would have been 247,800 pounds instead of 176,000 as used. Agreement was reached to use this method on future inventories. At September 30, 1948, the inventory will be 301,280 pounds.

Abrupt change was noted in the main flue inventory from January 31, 1948 to February 29, 1948, the former date showing 60,000 pounds and the latter date 600,000 pounds. Mr. Floyd stated that no doubt low recoveries prompted investigation of inventories to determine inaccurate tonnages and the main flue inventory was found to have been understated. Closer contact should be kept with the Research Department to avoid such abrupt inventory changes. The 600,000 pound inventory has since been cleaned up, the inventory at July 31, 1948, being 100,000 pounds. Suggestion is made that on the above mentioned flue, as well as on other flue system inventories, the Testing Department or others in charge should submit signed statements as to tonnages on hand. Failing under this classification is Blast Bag House fume in pits, reported by telephone to be 430,000 pounds on July 31, 1948. No report on this tonnage was available for audit.

Inventory Changes to Arrive at Reasonable Recoveries

Similar to practice used on metallurgical statements of the Montana Plants, the Metallurgical Accounting Department at the Tooele Plant arbitrarily changes metal content of inventories to arrive at reasonable recoveries. Explanation received was that assaying or inventorying was no doubt in error and to avoid stating unreasonable recoveries inventory changes were arbitrarily made. No cumulative record of such changes was available, but changes made on the July 31, 1948, inventories together with effect on recovery percentages are as follows:

	<u>Lead - Lbs.</u>	<u>Copper - Lbs.</u>	<u>Silver - Ozs.</u>	<u>Gold - Ozs.</u>
<u>Sintering Plant</u>				
Sinter Inventory:				
Original		50,741		
As revised		25,370		
Decrease		25,371		
Cleanings - Prercoat Inventory:				
Original		12,159		
As revised		6,079		
Decrease		6,080		
Recovery Percentage:				
On Original Inventories		110.86%		
On Decreased Inventories		99.13%		
<u>Blast Furnace Smelting Plant</u>				
Speiss Inventory:				
Original	270,144	800,858	48,429.66	815,891
As revised	280,594	655,067	54,351.31	754,545
Decrease	10,450	145,791	8,078.35	61,346
Recovery Percentage:				
On Original Inventories	100.01%	157.84%	109.54%	107.15%
On Decreased Inventories	100.69%	111.02%	105.03%	98.88%

Mr. W. H. Floyd, Chief Clerk at the Tooele Plant, was informed that the Montana Plants of the Anaconda Copper Mining Company were instructed by the New York Office that arbitrary inventory changes for the purpose of securing suitable recoveries were permissible except at June 30th and December 31st, when actual inventories and assays must be recorded. Mr. Floyd stated that when recoveries were out of line an investigation was usually made to ascertain under or overstatement of inventories and that the statements as reported gave effect to corrections which were necessary.

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INVENTORIES - LEAD PLANT (Continued)Inventory Taking

Clerks from the Metallurgical Accounting Department at the first of each month take measurements of all storage bins for determination of inventory tonnage and make observation of all miscellaneous inventories such as full and partial carloads, material on floor, etc. In some instances comparison of bin tonnages as reported by the Operating Department were at considerable variance with those as calculated by the Accounting Department. Operating Department tonnages were used for comparative purposes only except when clerical force was incapable of arriving at reasonable tonnages. For example on Slag Treatment Plant tonnages the superintendent's inventories were accepted as he was more familiar with the locations and approximate tonnages. A conscientious effort was made by the clerical staff to obtain accurate inventories.

SHIPMENTS - SLAG TREATING PLANTWeights used at Bartlesville, Oklahoma

Bartlesville weights and moisture percentages are used in making settlements for deleaded fume received from the Tooele Plant. In many instances the weight upon which freight was paid was disregarded, with notation "Wet down for unloading" being written upon the assay and weight certificate. Assumption is that fume was dry and dusty and water added to prevent dusting loss. Typical examples of weights after wetting down are as follows:

Car Number	Net Freight Weight	Bartlesville Wts.			Tooele Wts.			Dry Weight Difference
		Net	H ₂ O	Dry	Net	H ₂ O	Dry	
DRG 46497	113,760	117,220	3.05	113,640	115,840	0.00	115,840	2,200
MOP 23200	103,920	107,860	2.50	105,160	105,660	0.28	105,360	200

It may be noted that some loss apparently takes place between Tooele and Bartlesville as the comparison indicates. Of interest is also the loss in dry weight between Tooele weights and Bartlesville weights after wetting down. Both loss in transit and excessive moisture percentages used at destination account for the loss in dry weight. The Tooele Office keeps a tabulation showing the losses or gains incurred on all shipments. The cumulative data shows that a considerable loss is taken over a long period of time.

INVENTORIES - SLAG TREATING PLANTConsignment Stocks of Leaded Zinc Oxide

Consignees usually submit monthly letters on stocks held on consignment, along with remittance for sales. On November 23, 1946, car S.P. 37809 was shipped to The Pervo Company, Los Angeles, California. Due to financial difficulties of the Pervo Company this inventory (90,000 lbs.) was transferred to C. L. Duncan Company, Los Angeles, California during August 1947. Sale of 22,900 pounds was reported for November, 1947, leaving a balance of 67,100 pounds inventory. As no recent letters were on file from the C. L. Duncan Company relative to this inventory, inquiry was made at the Salt Lake Office relative to its status. The latest information on file was letter of March 9, 1948, C. L. Duncan Company to Pogoan, Paloubet and Company, confirming possession at December 31, 1947, of 671 bags high leaded zinc oxide, each weighing 100 pounds. This quantity is presently being carried as a portion of the consignment inventory.

SHIPMENTS - SULPHIDE CONCENTRATORZinc Concentrates to Anaconda and Great Falls, Montana

Agreement of January 1, 1945, providing for sale of concentrates to the Anaconda Copper Mining Company does not specify splitting limits or provide for umpire assays. Perusal of settlements from January, 1947, through July, 1948, disclosed very close agreement on zinc assay, major settlement factor. Widest difference between the companies was .5% and an average of the two assays was used on settlement.

Since correspondence is on file relative to splitting limits on blast baghouse fume to Great Falls and bismuth residue from Anaconda question arises as to desirability of establishing limits for zinc concentrates. As the transaction is between the parent company and a subsidiary, and since the assaying is in close agreement, no splitting limits may be desired. Establishment of limits should be at the discretion of the managements of the respective companies.

CONCLUSION

Audit of the metallurgical records of the Tooele Plant disclosed no errors or discrepancies of major importance except for divergence from contract terms on assaying and splitting limits as above described. All office records were neat and orderly and an exceptional degree of accuracy was noted both in calculation of settlements by the Ore Purchasing Department at the Salt Lake Office and in the preparation of statements by the personnel of the Metallurgical Accounting Department at the Tooele Office. Excellent cooperation was received from all departments during the course of this audit.

PNYC 00012283

INTERNATIONAL SMELTING AND REFINING COMPANY

TOOELE PLANT - TOOELE, UTAH

REPORT ON AUDIT OF THE COPPER PLANT, LEAD PLANT, SLAG TREATMENT PLANT AND SULPHIDE CONCENTRATOR PLANT OF THE INTERNATIONAL SMELTING AND REFINING COMPANY, TOOELE, UTAH FOR JULY 1948

MONTH OF JULY 1948

Audit of the Tooele Plant of the International Smelting and Refining Company embraces examination of records for the month of July 1948 to the extent outlined in "Books and Records Checked." No observation of July 31, 1948, inventories was made, but methods of inventorying were observed at August 31st and September 30th, 1948.

Audit covered all classes of material received and shipped and all inventories at July 31, 1948, as included in the July 1948 Tooele Plant Metallurgical Report.

Lead Plant ores from four shippers out of thirty two from whom ores were received were audited for weight and metal content. Ores from those four shippers represented 62% of total weight received during July 1948. About 25% of the settlements covering purchases of ore from the four shippers were audited in detail for adherence to contract terms, footings and extensions.

Sulphide Concentrator ores from the Park Utah Consolidated Mines Company and lessors of the National Tunnel and Mines Company were audited for weight and metal content. Ores from those companies represented 76% of total weight received during July 1948. Fifty percent of the Park Utah settlements and all the National Tunnel settlements were audited in detail for adherence to contract terms, footings and extensions.

Wherever possible, original sources of information such as scale tickets, assay certificates, bills of lading and plant reports were used in the audit. The report includes data on the physical and accounting features connected with receipt of material and shipments of products, determination of inventories, errors and discrepancies and general remarks concerning the audit.

The report is divided as follows:

	Pages
Synopsis of Plant Operation	1 to 4, Inclusive
Copper Plant	5 to 18, Inclusive
Lead Plant	19 to 23, Inclusive
Slag Treatment Plant	24 to 28, Inclusive
Sulphide Concentrator Plant	29 to 32, Inclusive
Errors and Discrepancies	33
General Remarks and Conclusion	34 to 40, Inclusive

See page following for detailed index.

E. C. Jacobson, Metallurgical Auditor

October 29th, 1948.

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