

MEMORANDUM

TO: J. Keily FROM: W. Krats
SUBJECT: ORE RESERVE & ULTIMATE PIT PLAN DATE: November 13, 1972
TIME TABLE

In October of 1972 we began work on an ore reserve and ultimate pit plan. The progress to date and planned time table is as follows.

It is planned to initially do Zone I to completion so that a most up to date mining plan to December 31, 1977 can be produced by years as quickly as possible. Following completion of Zone I, we would immediately proceed to Zone 2 and 3 and complete them to give us the necessary information to develop a year by year mining plan to exhaustion.

At present the geological cross-sections for Zone I are complete utilizing the latest information and our best interpretation of it. We are in the process of laying out the bench plans from these cross-sections. It is estimated that Zone I will be complete with a design pit to mine all the material which is estimated in the reserve for that section along with plans for 1975, 1976 and 1977 mining by late December 1972 or early January 1973.

We will then proceed to Zones 2 and 3 which should be completed as far as total ore and waste quantities are concerned and an ultimate pit design by March or April 1973.

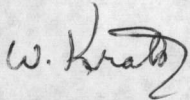
Mining plans by years to indicate grade and all material movement to exhaustion for long term planning purposes would then require another two or three months.

During this process a close look at edge ratios and the economics of mining some of the blocks on the fringes of the ore zone has not taken place. Further work in this area will be necessary to help us decide what circumstances are necessary to make mining and processing of certain blocks desirable. This exercise will undoubtedly in some areas change the shape of the first run at an ultimate pit.

An effort will also be made to relate diamond drill hole projections to blast hole analysis and what we are actually getting out of the mined areas. When a factor of some reliability can be established, this will be incorporated into the projections of ore reserves.

We are endeavoring to set up the complete process in as simple as possible a sequence to maximize on the utilization of all the people in the Engineering Department. The process will also be conducive to step by step checking of the complete routine as it progresses.

A memo to yourself on November 1, 1972 regarding Ultimate Pit Plans has more details regarding the complete process.



W. Krats
Chief Engineer

WK/mm

File
Engineering 10

MEMORANDUM

TO: J. Keily
FROM: W. Krats
DATE: November 1, 1972
SUBJECT: ULTIMATE PIT PLANS

The plan and progress with respect to an ultimate pit plan and reserve is progressing as follows:

It is the feeling of this department that for a reserve to be meaningful at this time, that we must begin from basic information and interpret this based on reasonable stated ground rules, and check every step of the process so that we are satisfied that mechanical errors and judgement errors are minimized.

Consequently the following program and general guidelines are being followed:

- 1) D.D. hole data is being transferred to cross-sections and being checked by a second person for accuracy.
- 2) All increments five feet or greater at 5% (Pb + Zn) or greater are being plotted as geological ore reserves.
- 3) Material less than 5% (Pb + Zn) within the geological ore zone is being indicated in two categories, high in massive sulphides and low in sulphides content.
- 4) Continuity of geological data is then projected from hole to hole on the cross-sections and being checked for interpretation.
- 5) Upon completion of the cross-sections, bench plans will be prepared for each bench. These plans will indicate the extent of the geological ore zones and the areas of influence of the D.D. holes. These will also be checked for accuracy and consistency.

- 6) Ground Rules will then be established for calculating of reserves from these bench plans. The first reserve will be calculated on a basis quite similar to the methods developed over the past several years and which were used in reserves stated as of Sept. 1970. This will give us a common basis for comparison of these two reserve calculations.
- 7) Upon completion of Item 6, we will attempt to calculate the reserves by one or two other methods and compare these to the present method. An evaluation of these methods will determine which approach is most suitable for our operation.
- 8) Upon completion of the reserve calculations, a 5 year mining plan through 1977 will be developed.
- 9) Emphasis at all times will be placed on defining the ground rules of the process and all steps of the process will be checked by someone other than the person who originally did the process. All this will be suitably documented for future reference.

The general schedule is to do Zone 1 first to completion to allow the completion of an acceptable 5 year plan. Then emphasis will be placed on Zones 3 and 2 to accomplish a total reserve and ultimate mining plan to exhaustion.

Every attempt will be made to set up data in a simple workable fashion to allow for efficiency in future use, for revision based on new information, for comparison to actually achieved results and previous reserves.

W. Krats
Chief Engineer

WK/mm