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Maintenance of Gold Mines in
Western Australia

by

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DEPARTMENT OF SUPPLY & SHIPPING.

Mineral Resources Survey Branch

MAINTENANCE OF GOLD MINES IN WESTERN AUSTRALIA.

Report No. 1944/53.

TYPES OF MAINTENANCE.

When a mine and plant are laid up for a considerable length of time, the maintenance work required falls into three categories which may be referred to as (i) primary maintenance, (ii) routine maintenance and (iii) reconditioning.

(i) Primary maintenance is the work required to put the mine, and especially the treatment plant, into such a condition that deterioration due to inactivity will be reduced to a minimum. This may include close filling of stopes where walls are weak; removal of all mining equipment from the mine, or storing in a part of the mine where it is least likely to be damaged by rust, etc; oiling, greasing and covering of surface machinery to protect from dust and moisture; tarring and painting of cyanide vats and other tanks; rolling up of belts; and general cleaning up of the plant. In most cases, this primary maintenance work was carried out immediately after the mine closed, but in one or two cases, little or no attention was given to this aspect of maintenance, with the result that the deterioration due to idleness at these plants is many times that at the properties which were attended to thoroughly at the time of closing down. In one or two cases, notably at Consolidated Gold Mines of Coolgardie, (Tindal's), this primary maintenance work has not yet been completed.

(ii) Routine maintenance is that which has to be carried out continuously to keep the plant in working order and the mine in proper condition for reopening. If the ground is weak or the stopes are filled, the mine has to be kept dewatered to prevent the walls collapsing, or loose filling from washing out of the stopes and blocking the levels. In cases of bad ground, timber may have to be renewed and falls of rock cleaned up and levels timbered to keep them open. On the surface, motors have to be run occasionally to keep in working order and other machinery turned over. Conveyor belts, if they have not been rolled up, require running now and again, otherwise they tend to set in one position and sag between the supporting rollers. Moving parts have to be kept oiled and greased.

If bailing or pumping is being carried out, the necessary engines have to be operated and kept in order and any running repairs required to the engines or pumps have to be done. Where shafts are in use, they have to be regularly inspected to see that the timber is in good condition and, if bailing is being done, skids may have to be repaired. Under certain circumstances this may necessitate the employment of four men; an engine-driver, a winder-driver, and two men to carry out the actual repairs.

Mill buildings and housing may need occasional repairs due to wind-storms, whirlwinds or normal processes of decay. Supplies of firewood for boilers, fuel for engines, water in many cases, and stores have to be kept up, and in properties which are situated some distance from a town or railway, a motor vehicle of some sort is a necessity.

(iii) The third type of maintenance is that which is necessary to restore the plant to running order and to put the mine into production again. This type of expense has, of course, not yet been incurred, but will be necessary in the future. The amount of this reconditioning work that is necessary will depend partly on the type of property and plant, and partly on the condition in

which the mine was left. In every case advance finance, whether provided by the company or by the Government, will be necessary for the purchase of stores, payment of wages, and running expenses until the time when revenue is being received from the sale of the bullion produced. A plant which has been laid up properly and which was in good condition when operations ceased, will require comparatively little preliminary work before it is ready to resume. Many of the companies, however, have had parts of their machinery, engines particularly, requisitioned by the Government for various uses or have sold or transferred parts of the plant to other mines. The proceeds of such sales may not be sufficient, or may not be available, to cover the cost of replacements.

With regard to the underground workings, in those cases where the mine has been kept dewatered and the workings maintained, comparatively little may have to be done apart from getting the mining equipment back into the mine and perhaps relaying rails and pipes. In some cases, however, notably that of the Triton mine, an extensive and costly programme of mine reconditioning will have to be carried out before production can be resumed. In order to avoid excessive routine maintenance costs, repair work at this mine, where the ground is constantly moving, has been kept to a minimum. Before mining can be undertaken, extensive retimbering will be necessary on the levels, tracks will have to be relaid, ore passes repaired, bad ground picked up and stopes made ready for ore extraction.

In most of the maintained mines, the companies attempted to carry on with a continually diminishing labour force until they were finally compelled to shut down. Mining costs do not decrease in proportion to tonnage mined and it may require almost the full labour force in a treatment plant to handle only a proportion of the tonnage for which it is designed. If a plant is intended to treat 10,000 tons a month, that figure is its optimum tonnage, though it may be possible to treat as low as, say, 7,000 tons at a profit. Below that figure, the amount of gold being returned for an almost equal output on labour and other running costs may not be sufficient to recoup outlay. This principle is particularly applicable in the case of the larger mines.

Many mines continued operations until the reduced numbers of miners available forced them into this position. When underground labour became scarce, the first thing that suffered was development work and, in some cases, the developed ore was worked out and the mine was left in the condition that proved ore reserves were almost or entirely depleted, and extensive development programmes will be necessary, first to prove additional ore and secondly to develop it for stoping. This condition is brought about directly by the withdrawal of manpower from the mines as otherwise it would have been done concurrently with ore extraction. Now the position is that considerable finance will be required to carry out this development work before production can be resumed.

Other mines have been allowed to fill with water and these will need to be dewatered, preferably by bailing, and bailers will have to be provided if none is on the property. Dewatering will necessitate the employment of engine-drivers and winder-drivers to work three shifts until the job is completed, and whatever underground crews may be necessary. This, of course, will be a charge against maintenance, as the course of allowing the mines to fill with water has been adopted as a cheaper alternative to keeping them dewatered in those cases where it was considered that no serious damage would result to the workings if the water were allowed to rise.

With regard to those mines in which extensive reconditioning or development work is necessary before operations can be resumed, it is highly desirable that consideration be given to what should be the attitude of the Commonwealth Government. Capital expenditure will be necessary, and unless a mining company can see a good chance of making a profit on its outlay, it will not be likely to spend money on the reopening of a mine, and indeed will probably, in most cases, have extreme difficulty in raising that money. A mining company

will not be interested in just getting its money back and will not be guided by any altruistic motives, such as finding employment for a number of people for a number of years. On the other hand, both Commonwealth and State Governments have a definite interest in getting as many mines as possible into operation for the longest possible time. Towns like Wiluna, Reedy, Big Bell, Norseman, Laverton, Leonora and even Kalgoorlie itself, which are dependent almost entirely upon mining, practically go out of existence when mining ceases. In the case of a town like Reedy, where the Triton mine employs about 300 men, with a payroll of \$420,000 to \$450,000 and a gold production worth \$300,000 per year, or Big Bell where the figures are proportionately higher, the revenue to the Government when the mine is working, which includes Income Tax, Payroll Tax, Gold Tax, Excise Duty and Customs Duty, Sales Tax, Post Office Revenue, Railway Freights and Fares (State Government), etc., is very considerable.

In addition to providing employment for the employees and thereby subsistence for their families and for the remainder of its population, all other activities in the town are entirely dependent for continued existence upon the mine. It keeps population in the district and serves as an operating centre from which prospectors radiate out into the surrounding country with the ever-present chance of more discoveries. Ore from outside lodes is treated, in many instances, in the companies' plants, enabling smaller bush centres to exist which otherwise would not be able to handle their ore profitably. A further important consideration is the provision of employment and livelihood for so many people who might otherwise become, through unemployment relief, a direct charge on the Government. Any money advanced to ensure reopening of mines under these circumstances might be regarded as sound investment from the Government's point of view.

These considerations are set out here because they have a direct bearing on maintenance problems and because it is of the utmost importance that the Commonwealth Government should formulate in advance what its policy is going to be towards the reopening of many "border-line" mines, for it seems certain that many such mines, which have been forced to shut down owing to the withdrawal of manpower and which have exhausted their capital, and in some cases their credit, will require considerable financial assistance before they can be put into production again. More detailed representations on this subject will probably be made by the Mining Advisory Panel.

BIG BELL AND TRITON.

Special circumstances exist in the case of the Big Bell and Triton mines. The greater part of the maintenance money is being spent at these two mines and it is desirable on these grounds that they should be reopened as soon as possible. Wiluna Gold Mines Ltd., according to the present intention, will be ceasing full-scale operations at the end of September of this year and from that time onwards there will be a very considerable release of manpower from this centre. A very strong case exists therefore for synchronising the reopening of Big Bell and Triton mines with the release of labour from Wiluna. The attention of the manpower authorities and of the Directorate of War Organisation of Industry should be drawn to the desirability of allowing these employees and their families to transfer from Wiluna to either Big Bell or Reedy, and of organising the resumption of operations at these mines in such a way that this transfer can be carried out with the least possible dislocation of employment and of population.

"NON-ALLOWABLE" ITEMS.

Under the recently revised scale of maintenance submitted to the Western Australian State Government, certain items have been listed as no longer allowable. These items have been discussed with officials of the West Australian Mines Department and with representatives of the various companies concerned. In the circumstances existing on the Western Australian goldfields, some of these items must be included under the heading of essential maintenance requirements.

Fire Insurance. It has been suggested that plant and buildings on some of the mines might be in considerable danger from bush fires in the dry season, apart from risks from fires caused internally, and that fire insurance would seem to be a reasonable maintenance charge. With one or two exceptions, however, most of the assisted properties are so situated that they are in very little danger from bush fires, and even in those exceptional cases the risk could be minimised by a few elementary precautions. It is suggested that a limited amount of fire insurance might be accepted as a charge against maintenance only in those cases where the owners of the properties concerned can submit a sufficiently convincing case to justify it.

Mine Workers' Relief Fund. This is a statutory payment for underground workers and accordingly has to be allowed.

Geraldton Oil Tanks. The Geraldton Oil Distributing Co. Ltd., handles the distribution of oil at Geraldton and its forwarding to the three companies, Wiluna Gold Mines Ltd., Triton Gold Mines E.L., and Big Bell Mines Ltd. These mining companies contribute to the expenses of the Geraldton Oil Distributing Co. Ltd. in proportion to the amounts of oil normally used and these contributions are a necessary part of the expenses of purchase of any type of liquid fuel.

Rates and Taxes. These items are the rates charged by the local Roads Boards who are responsible for providing and maintaining the district roads. The State Mines Department has endeavoured to secure a suspension of these rates in the case of those mines which are on a maintenance basis, with varying success. Some Roads Boards have agreed to forego all or part of the rates, others have insisted on the full charges being made.

Transport and Vehicle Licences. Most of the mines which are being maintained are situated some distance from the nearest town or railway and are dependent on their own transport for the provision of stores, including domestic supplies, spare parts, fuel, firewood and, in some cases, water. Under the circumstances, the running costs of the necessary motor vehicle, including registration fee and Third Party insurance, are considered to be a justifiable charge against maintenance, as the work could not possibly be carried on without transport.

Water Rates. These rates are incurred by mines such as Grapanda, Consolidated Gold Mines of Coolgardie Ltd., and Spargo's Reward, which are connected to the Goldfields Water Supply Scheme. As the provision of water for boilers, engines, etc., is a very essential part of the maintenance work at these mines, it must be considered an allowable maintenance charge. Both water rates and motor vehicle registration fees are items of State Government revenue and it might be possible, in the case of the maintained mines, to make arrangements with the State Government to suspend these fees.

CONCLUSIONS.

The properties upon which maintenance monies are being expended have been examined in company with the Western Australian District Inspectors of Mines or State Mining Engineers and joint reports have been prepared dealing with each case. These reports have been forwarded to the Under Secretary for Mines, Western Australia, for distribution. The recommendations made in these reports should come into effect as soon as possible after the Mines Department has notified the owners of the properties concerned, or their representatives, of any revisions in the schedule of maintenance which are involved. Where a reduction in the number of employees is to be made, it will be necessary to allow the prescribed amount of notice of termination of employment.

Prior to the introduction of the revised scale of maintenance as set out in the Acting Prime Minister's letter of May 4th, 1945, to the Premier of Western Australia, the cost to the Commonwealth of maintenance of gold mines in Western Australia was approximately £4,635 per month or £55,600 per year. The reduction in costs according to that

revised scale amounted to approximately £540 per month or £6,500 per year. The recommendations made in these reports on essential maintenances will eventually result in a further reduction of between £7,000 and £8,000 per year in the amount spent on routine maintenance.

Minor changes in the scale of maintenance should continue to be at the discretion of the Western Australian Mines Department, whose officers are familiar with the requirements at each assisted mine and who are consequently also in a position to be able to check the lists of stores used on maintenance work and to ensure that all the items included in the lists are a reasonable charge against maintenance.

It is recommended also that the supervisor at each mine, apart from those at which the maintenance comprises caretaking only, should be required to forward to the Western Australian Mines Department, through the District Inspector of Mines, a monthly report setting out the maintenance work done and the manner in which the employees were occupied during a month.

This opportunity is taken of expressing deep appreciation of the cordial co-operation accorded by the Western Australian State Mines Department, who provided transport and office facilities, and did everything possible to expedite the necessary examinations.

CANBERRA, A.C.T.
21st August, 1945.

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