



WaterMiner – Mine Water Management

ENG460 Engineering Thesis Report

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Abstract

In the Australian and New Zealand gold mining industry the use of water is an integral part of the entire mining process, from the initial extraction of the ore to its final processing. The way in which water is managed on site effects the running costs, extraction rates, water usage and environmental impacts. Therefore it is crucial to implement a Water Efficiency Management Plan to optimise site water management.

This study investigates the current water management strategies at four gold mines within Australia and New Zealand operated by Newmont Asia Pacific. A review of water management at each of the gold mines identifies areas of both good water management, as well as opportunities for improvement.

A web-based information system designed for mine water management entitled WaterMiner, has been developed by the University of Queensland. The WaterMiner program has been used in this study to explore further opportunities for improving water management at each of the mine sites. The results obtained from the WaterMiner program have identified where significant improvements to water reuse and recycling can be made, and have provided recommended flows to improve these areas.

It is recommended that the suggested improvements be implemented through the use of site water management plans, to provide a smooth transition into site practices. As current water management plans are only in place at two of the study sites, KCGM and Waihi Gold, Water Efficiency Management Plans (WEMP) have been developed for the remaining two gold mines, Jundee and Tanami.

Through implementation of the WEMP's and the suggested new flows, significant improvements in water management can be made at each site. The concluding results for each on the gold mines are as follows:

- Through the implementation of the created WEMP and recommended flows the Newmont Jundee Operation can reduce its annual water usage by 174.99ML/year, approximately 8.01%.
- By incorporating recommended flows into its current WEMP the KCGM Operation can reduce extraction from three of its major water sources by 1,479.04ML/year, approximately 31.27%.
- Development of a WEMP for the Newmont Tanami Operation, inclusive of recommended flows produced by WaterMiner, will reduce extraction rates by 329.84ML/year, approximately 17.20%.
- Implementation of new recommended flows into the current WEMP in place at the Newmont Waihi Gold operation will decrease water extraction rates by 1,031.23ML/year, approximately 14.67%.

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