

# THE APPLICATION OF 3S TECHNIQUES TO THE RECLAMATION OF CHINESE COAL REFUSE DISPOSAL PILE<sup>1</sup>

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**Abstract.** Coal refuse or coal waste is an incidental production of coal exploitation and processing, which roughly account for 10%-20% of the raw coal production. In China, there is a large amount of coal refuse owing to enormous amount of coal mining operation. In most cases, coal refuse is disposed continuously along with the coal exploitation and processing and consequently piled into anthropogenic hill, which is called “coal refuse disposal pile” or “coal waste pile”. It not only pollutes the nearby environment, but also the pollutes air flows to the residential area about 0.8 km from the coal refuse disposal pile. Therefore, the control of coal waste pile is urgently needed. The intention of this paper is to take a typical long-term abandoned coal refuse disposal pile as a study site, monitor both spatial information and chemical information, and estimate the reclamation cost. 3S (GPS, GIS and RS) integrated technique is applied at the monitoring for spatial information extraction, where the basic spatial information refers to plan area, surface area and volume. Due to the long-term emission of coal refuse pile, it is estimated that the sulfur content is extremely low. Further sampling and testing were conducted to prove this estimation. Based on spatial information extracted from remote sensing image and topography map using 3S techniques, as well as the estimated acidity information, the land reclamation project cost calculation of coal refuse disposal pile is operated in accordance with the cost of neutralization, regrading and revegetation. Neutraliation for coal refuse pile is eliminated, for the low sulfur content, while local plant species are selected for indigenous benefit. In general, this paper conducts the monitoring of typical long-term abandoned coal refuse pile, and generally estimates the total cost for land reclamation project.

**Key words:** coal refuse pile, reclamation, monitoring, spatial information, cost estimation

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