

Mine Management and Ecological Restoration of Xinmao Quarry in Baoshan Town, Qingdao



ZHAO Yuting^{1,2,*}, LIU Honghua^{1,2}, JIANG Guohui^{1,2}, DONG Jie^{1,2} and GUAN Yong^{1,2}

¹ Qingdao Geo-engineering Exploration Institute, Shandong Provincial Bureau of Geology and Mineral Resources, Qingdao 266000, Shandong, China

² Key Laboratory of Urban Geology and Underground Space Resources, Shandong Provincial Bureau of Geology and Mineral Resources, Qingdao 266000, Shandong, China

Citation: Zhao et al., 2019. Mine Management and Ecological Restoration of Xinmao Quarry in Baoshan Town, Qingdao. *Acta Geologica Sinica* (English Edition), 93(supp.2): 456–457.

Abstract: In order to promote the comprehensive utilization of mountains and the greening of mines, eliminate the hidden dangers of geological disasters existing in abandoned quarries and restore the ecological environment, the PPP project of the comprehensive rehabilitation project of mountain bodies in the new area of the west coast of Qingdao has treated 18 closed abandoned quarries within the jurisdiction of the New Area of the West coast, taking Xinmao quarry in Baoshan Town as a typical example, and achieved remarkable results.

Before the treatment of Xinmao quarry, due to long-term mining activities, a quarry pit with a length of about 310 m and a width of about 140 m was formed, with a depth of 48 m and a slope angle of 64–70 degrees (Fig. 1). In the past, the reliability and safety of the slope were the key points in the treatment of abandoned quarries. And the selection of vegetation and the corresponding restoration technology are the core of the slope treatment of abandoned quarry. However, which neglects the landscape design of ecological control project in some aspects. On the basis of vegetation restoration of abandoned quarries, this paper puts forward the corresponding ecological renovation scheme and design ideas of landscape design: combining the utilization nature of surrounding land, scientific planning, filling the mine back to the same elevation of surrounding land, and unified re-tillage treatment, cutting and shaping the damaged high and steep half slope, eliminating the hidden danger of geological hazards. And spraying greening by hanging net to restore the damaged ecological environment (Fig. 2). First of all, the site leveling adopts the method of unifying the surrounding land, excavating and filling low, and sorting the original uneven terrain into a unified elevation. Due to the different thickness of the planting soil in the land consolidation area and the design elevation after finishing, the original cultivated land on the south and southwest side of Shikeng is divided into 1#, 2# and 5# areas. The land consolidation of the slag excavation site on the southeast side of the quarry is divided into 3# and 4#; the excavated planting soil during the finishing process is smashed; the excavated muck and the stone are backfilled into the pit to level the site. Secondly, the surface was backfilled with 1.0 m thick planting soil for re-tillage treatment. Then, the north side slope of the quarry pit is cut and shaped, and the residue soil generated by the cutting slope is



Fig. 1. Comparison before (left) and after (right) the treatment of Xinmao quarry in Baoshan Town.

backfilled into the quarry pit. The slope of the west side of the quarry is cleaned and sprayed by hanging net and planting plants. Finally, the method of embedding the cement pipe in the process of backfilling the muck is carried out for the large puddle on the east side of the bottom.

In summary, the Xinmao quarry control project in Baoshan Town is a PPP project for the benefit of the people. Through the treatment, it has eliminated geological environmental problems, geological hazards and visual pollution, restored the surrounding ecological environment, and the cultivated land area has been sorted out about 114 mu. The newly added arable land area is about 51 mu, which brings great economic and social benefits. Through the treatment of geological environmental problems, the lives and property of the people are guaranteed, and the “people-oriented” of the party and the government is fully embodied. It is a full expression of the harmonious development of human and

* Corresponding author. E-mail: zhao_yuting@126.com

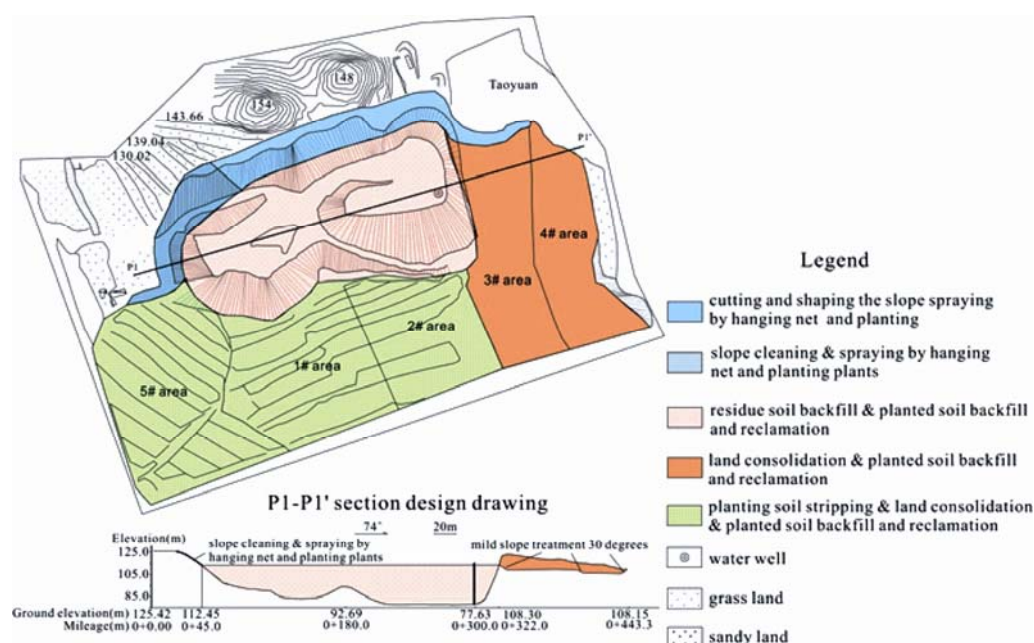


Fig. 2. Plane Layout of Engineering in Governance Area.

nature, and provides the reference for ecological restoration and landscape reconstruction of mine greening and abandoned quarries is provided.

Key words: Xinmao quarry, mine management, ecological restoration, PPP project

References

- Lei, K., Pan, H.Y., and Lin, C.Y., 2016. A landscape approach towards ecological restoration and sustainable development of mining areas. *Ecological Engineering*, 90(none): 320–325.
- Wong, M.H., 2003. Ecological restoration of mine degraded soils, with emphasis on metal contaminated soils.

Chemosphere, 50(none): 775–780.

About the first author



ZHAO Yuting, female; born in 1981 in Shuangyashan City, Heilongjiang Province; PhD; graduated from Jilin University; senior engineer of Qingdao Geo-engineering Exploration Institute, Shandong Provincial Bureau of Geology and Mineral Resources. She is now interested in the study on mineral survey and exploration, engineering geology. Email: zhao_yuting@126.com; Phone: +8618653201560.