基于层次分析法的复合煤层露天矿初始拉沟位置确定

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TD824 A doi 10.3981/j.issn.1000-7857.2014.30.013

Determination of the Composite Coal Mine Initial Trenching Position Based on the Analytic Hierarchy Process

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Abstract The determination of open-pit reasonable trenching position has important influence to open-pit mine production continue and stripping control. The essay applicate the basic decision theory of analytic hierarchy, construct hierarchical analysis model of comprehensive evaluation of open-pit mine trenching position scheme, combined with the coal storage and present situation of mining in Inner Mongolia Baorixile open-pit mine, explain the feasibility and the necessity of the coal mine ditch in the mined out area of three mining the upper coal seam and exploit the lower coal seam. According to the choosing principle of open-pit trenching position and the mine special geological and topographic conditions, design two trenching position optimization, and analyzes the influence of various factors on the lower coal seam trenching position selection. Using the analytic hierarchy process, analysis of the advantages and disadvantages of each scheme comparison, eventually determine the most reasonable trenching position scheme. The result shows that: the evaluation result of analytic hierarchy process accords the actual situation, simple calculation, and has stronger practicability.

Keywords analytic hierarchy process; trenching position; trenching project; optimization of comparison

2014-03-04 2014-08-05

L2011051 MTKJ2012-306

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[J]. , 2014, 32(30): 74-79.

1 基于层次分析法的模糊综合评价模型

1.1

1.2

1.2.1

1.2.2

$$\bar{b}_{ij}=\frac{b_{ij}}{\sum_{i=1}^{n}b_{ij}}\quad(i,j=1,2,\cdots,n) \tag{1}$$

$$\overline{W}_i=\sum_{i=1}^{n}\bar{b}_{ij}\quad(i=1,2,\cdots,n) \tag{2}$$

$$W_i=\frac{\overline{W}_i}{\sum_{j=1}^{n}\overline{w}_j}\quad(i=1,2,\cdots,n) \tag{3}$$

$\boldsymbol{W}=(W_1\ W_2\ \cdots\ W_n)^{\mathrm{T}}$

1.2.3

$$\lambda_{\max}=\sum_{i=1}^{n}\frac{(\boldsymbol{BW})_i}{nW_i}\quad(i=1,2,\cdots,n) \tag{4}$$

$$CI=\frac{\lambda_{\max}-n}{n-1} \tag{5}$$

$$CR=CI/RI \tag{6}$$

$CR<0.10$

1.3

$$d_i=\omega_i\cdot\omega_i^n\quad(i=1,2) \tag{7}$$

2 实例分析

2.1

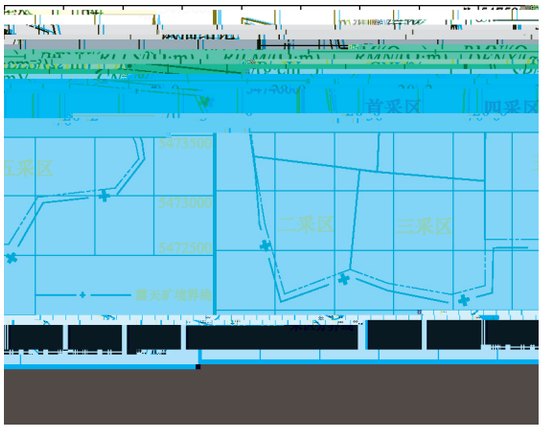
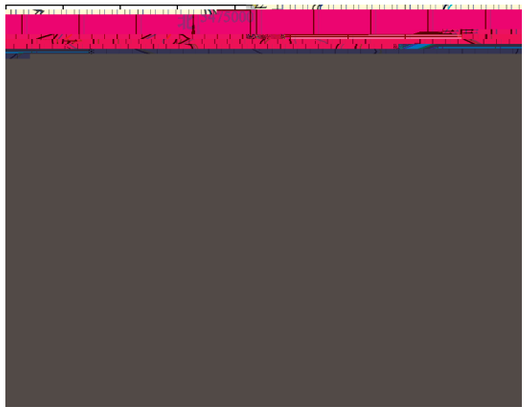
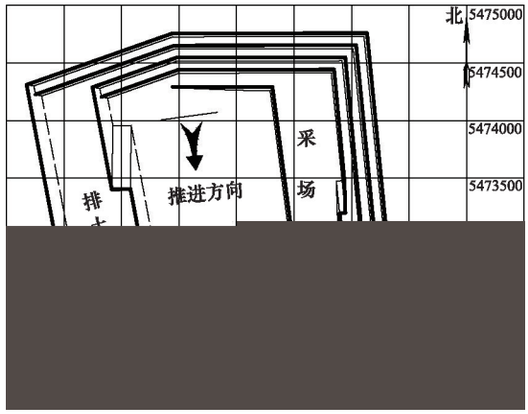


Fig. 1 Open-pit mining realm diagram



a 1



b 2

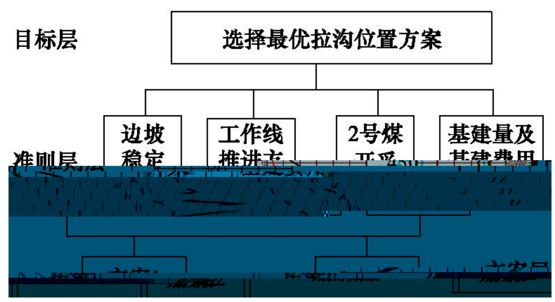
Fig. 2 Groove position scheme

2.2.3

2.2.4 2013 2013 2013

Table 1 Capital construction amount and capital construction cost in two projects

	← /m	/m	← /m	/m	/Mm³	/Mt	/(m³·t⁻¹)	/	/	/	/km	/m	/
1	1000	400	760	230	5.63	0.21	10.42	14713.31	402.9143	1936	2.413	51	2
2	450	880	380	640	5.95	0.45	9.13	15298.76	421.3874	1975	2.824	51	2.5



3

Fig . 3

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