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1. Project Background

1.1 Socio-historical background

Most of the raw materials for modern industry come from underground. The ingestion of resources from underground is done in two main ways: open pit mining and tunnel mining. Surface mining is the earliest form of mining in which human beings used minerals, initially mining outcrops and shallow rich ore deposits. since the use of power excavators at the end of the 19th century, open pit mining technology has developed rapidly and the scale of open pit mines has become increasingly large. About 2/3 of the world's total solid minerals are mined by open pit. In recent years, due to the serious irreversible damage to the surface caused by open-pit mining, the number of caverns using this mining method has gradually decreased, but in some high-quality mineral areas, open-pit mining is still the best choice. Although open pit mining has many advantages, after the switch from hillside open pit mining to deep concave mining, the slope of open pit is getting higher and higher, and it is more difficult to study, control and maintain the stability of the slope, and the slope engineering problems obviously affect the effect of investment and production operation of open pit mine construction [1].

1.2 Project Background

1.2.1 Projects

This project requires excavation of a particular mineral in the world. It is required to increase the slope of the hole as much as possible by means of calculations and simulations in order to reduce the cost of the excavation and the area of surface soil destroyed, to reduce the cost of the project as much as possible, to reduce the number of holes dug, to reduce the overall project time and to reduce the volume of work, while ensuring environmental, safety, ethical and exemplary requirements. For this project we chose the open pit mining method.

1.2.2 Group Project Introduction

The target mineral chosen by our group is uranium ore. Uranium mining is mainly used to provide uranium raw materials for nuclear energy development and utilization, and at first it was mainly used in military-related fields such as atomic bombs, but later, along with the development of nuclear power business, the main driving force of uranium mining changed to provide raw materials for nuclear power. In addition to the environmental problems of other mineral deposits, uranium mining may also be accompanied by the hazards of radioactive contamination. Radioactive radon pollution Radon exists in minerals containing uranium or thorium, and also exists in the atmosphere near the ground, which is soluble in water and has strong radioactivity and can emit high-energy α particles and γ rays with a half-life of 3.825 days [2].

In addition to the environmental impact of uranium mining in general, there are also its own special characteristics, which are radioactivity and radiation hazards. The waste rocks from uranium mines contain a certain amount of uranium and radium, and also constantly release radon and long-lived radionuclides, etc. These long-lived radionuclides will further expand the pollution due to the re-suspension effect, taking into account the effects of weathering, denudation, percolation and other effects, as well as the surface water and storm water washing and migration flow [3].

For this project, we first determined the target mine site in Australia based on probability see Table 1, and then determined the subsurface soil data by test drilling, and determined the subsurface rock distribution by subsurface soil data. After obtaining more accurate underground rock formation data, we determined the final dredging site by establishing indicators to consider the economic, safety and environmental benefits comprehensively. Subsequently, we confirmed the dredging depth and used the finite element method, Swedish slit method, Slope64 software for data analysis and simulation through Visual Slope to determine the best slope. Finally, the final project report was completed based on the local conditions and the actual conditions.

Table 1World uranium reserves by country 2021 and percentage of the world [4]

Serial number	country	Uranium resources	Percentage	Representative deposits and deposit types
1	Australia	1706. 1	28. 90	Alligator River (Unconformity-related); Olympic Dam (IOCG)
2	Kazakhstan	679. 3	11. 51	Kokshetau (Sandstone-type); Pribalkhash (Sandstone-type)
3	Russia	505. 9	8. 57	Out Urals, Out Baikal, Western Siberia(Sandstone-type)
4	Canada	493. 9	8. 37	Mc Arthur River (Unconformity-related);Cigar Lake (Unconformity-related)
5	Niger	404. 9	6. 86	Arlit, West Afasto (Unconformity-related)
6	South Africa	338. 1	5. 73	Witwatersrand (Quartz-pebble conglomerate)
7	Brazil	276. 1	4. 68	Itataia (Phosphorite)
8	Namibia	382. 8	6. 48	Rossing (Surficial)
9	U.S.A	207. 4	3. 51	Colorado Plateau (Sandstone-type)
10	China	199. 1	3. 37	see blow
	total	4857. 8	82. 30	
	World total	5902. 9		

(OECD, 2014; Rogers, 1996; Zhao et al., 2002; Cawood et al., 2007; Tack et al., 2001)

2. Project Objectives

2.1 Project Objectives and Uranium Mining Program Evaluation

During the course of this project, various factors were taken into account. We considered the following comprehensive indicators: lowest project cost, lowest project time, mining safety, maintenance cost of equipment, safety of radioactive material preservation, engineering sustainability, environmental level of atmosphere, environmental level of soil, environmental level of water resources, scalability, secondary development level, resource collection rate, and highest waste conversion ratio.

Based on the above principles of mine mining scheme evaluation index system construction, the research results of sustainable development index system are integrated to establish a relatively complete uranium mine mining scheme evaluation index system, see Table 2. the index system consists of guideline layer, sub-criterion layer and indicator layer, including 3 guidelines, 9 sub-criteria and

25 indicators. And the importance of the main indicators was confirmed through expert voting according to the content of Table 2, as shown in Figure 1.

Table 2 Indicators of the comprehensive evaluation system of uranium mining programs

Criterion layer	Subcriteria layer	Index layer
Economic performance	Production index	1) Mining scale 2) Metal production
	Cost index	3) Total investment 4) Unit operating cost
	Production and operation effect	5) Annual sales revenue 6) Payback period 7) Financial net present value 8) Internal rate of return
Social results	Enterprise sustainable development	9) Scientific and technological innovation income 10) Supplementary exploration income 11) Service life
	Sustainable utilization of resources	12) Mining and utilization rate of mineral resources 13) Comprehensive utilization rate of mineral resources
	Impact on regional economy	14) Tax revenue 15) Drive local economic growth 16) Stimulating employability 17) Contribution to uranium resources
Sustainability and Environmental	Safety	18) Mining safety 19)safety of storage of radioactive materials
	Expansibility	20)resource acquisition rate 21)waste conversation ratio 22)secondary development level
	Sustainability	23)atmospheric environmental protection 24)soil environmental protection level 25)water resources environmrntal protection levlel

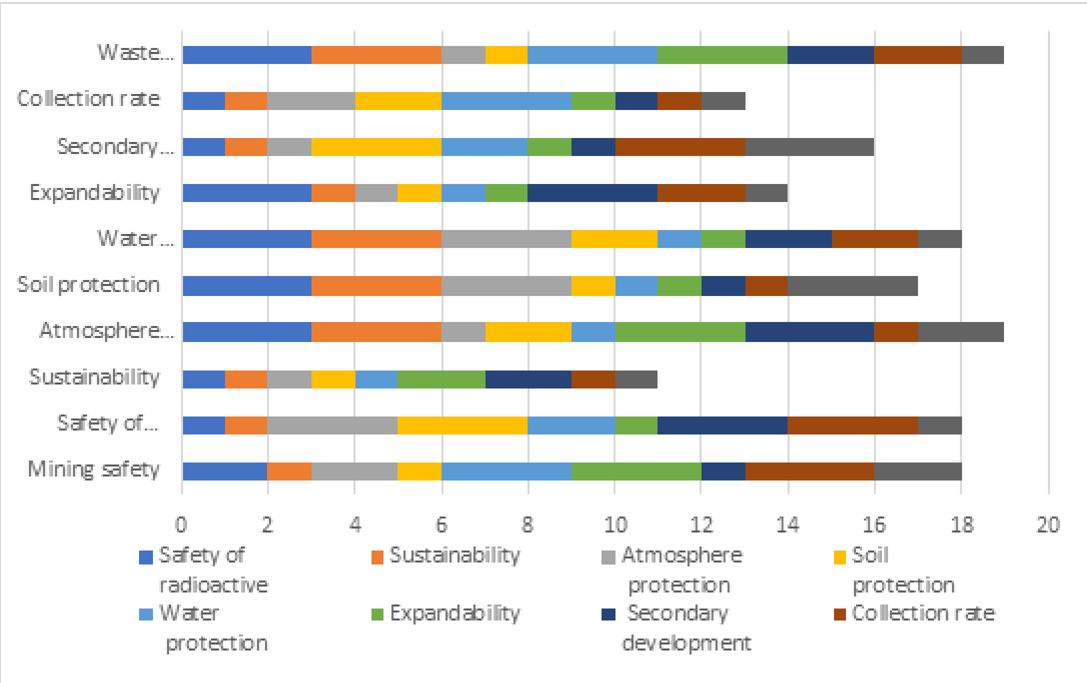

Figure 1 Bar chart of the main evaluation of the uranium mining program

Decision Table	Mining safety	Safety of radioactive	Sustainability	Atmosphere protection	Soil protection	Water protection	Expandability	Secondary development	Collection rate	Waste conversion ratio
Mining safety	1	2	1	2	1	3	3	1	3	2
Safety of radioactive	2	1	1	3	3	2	1	3	3	1
Sustainability	1	1	1	1	1	1	2	2	1	1
Atmosphere protection	1	3	3	1	2	1	3	3	1	2
Soil protection	3	3	3	3	1	1	1	1	1	3
Water protection	1	3	3	3	2	1	1	2	2	1
Expandability	3	3	1	1	1	1	1	3	2	1
Secondary development	2	1	1	1	3	2	1	1	3	3
Collection rate	3	1	1	2	2	3	1	1	1	1
Waste conversion ratio	1	3	3	1	1	3	3	2	2	1

Figure 2　Expert voting matrix for the main evaluation of uranium mining programs

2.2 Project Notes

1 Ensure the ability of the construction party: market image and reputation, whether the construction of similar (similar) scale projects in the past three years, the quality of the construction projects in the past three years.

2 Determine the overall construction plan: the main machinery and equipment put into the project and the incoming plan, the main materials put into the project and the labor supply plan.

3 Adherence to engineer's design specifications.All projects are subject to local engineer's specifications, and in this project, we are specifically required to meet the following specifications. Real time seeking, adhere to the ethical standards in mind. Be honest and trustworthy and maintain honesty in dealing with people during the project. Work responsibly with the community and other stakeholders.

Pay attention to environmental issues and the soil restoration that comes afterwards.

3. Project Design

3.1 Project Survey

3.11 Natural Ecological Environment Survey

According to the picture analysis, see Figure 3 the mine area is a basin surrounded by low and medium hills. It is dominated by hills and mountains. The topography of the mine area is high from east to west and low in the middle, and the relative height of the strata is around 150m.

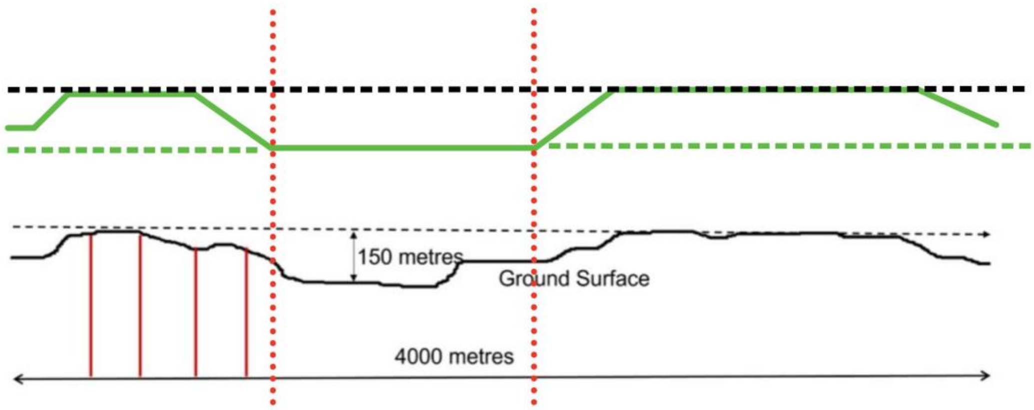

Figure 3 Terrain Analysis

Most of the current methods of ecological impact assessment are still in the exploratory stage and most of the data of each indicator appear in qualitative form. Combined with the characteristics of the impact of uranium mining on the ecological environment the proposed uranium mine ecological environmental impact effect identification and indicator weights are shown in Table 3.

Table 3 Ecological and environmental impact of uranium mines and index weights [5]

Subsystem	index	Positive effect			Negative effect			Weights/%
		big	middle	small	big	middle	small	
	topography				√			12
	Land erosion					√		12
	Water conservation						√	8
Natural ecological environment	Vegetation coverage					√		12
	wild animals					√		4
	Environmental pollution						√	16
	Crop pollution						√	6
	Water resource utilization			√				3
	Land utilization			√				10
Social ecological environment	Gross national product			√				7
	infrastructure		√					5
	Urbanization level		√					5

Based on the index values and weights of each index item, the following formula is used to calculate the total index [5].

$$I = \sum_{i=1}^{n_1} W_i I_i, \sum W_i = 1$$

For the convenience of judging the ecological environment, the total index of ecological environment quality is divided into five grades: excellent, good, medium, poor and bad, and the grading range of the total index is shown in Table 4.

Table 4 Ecological Environment Index Grading [5]

Serial number	Environmental quality level	Total index grading range
1	Excellent	0.80<I≤1.00
2	Good	0.60<I≤0.80
3	Middle	0.40<I≤0.60
4	Bad	0.2<I≤0.40
5	Worse	0.00<I≤0.20

Land erosion and soil erosion analysis. The general soil erosion formula was used to estimate the soil loss. Where: A is the soil loss per unit area $t/(hm^2 \cdot a)$; R is the rainfall erosion force factor $J \cdot cm/(hm^2 \cdot a)$; K is the soil factor $t/(J \cdot cm)$;

L is the slope length factor S is the slope factor, L is the topography factor; C is the vegetation cover factor; P is the erosion control measures factor.

$$A = RKLSCP$$

3.12 Underground rock resources survey

We determined the following geological topography map by changing the number of samples based on the rock subsurface exploration data, see Figure 4.

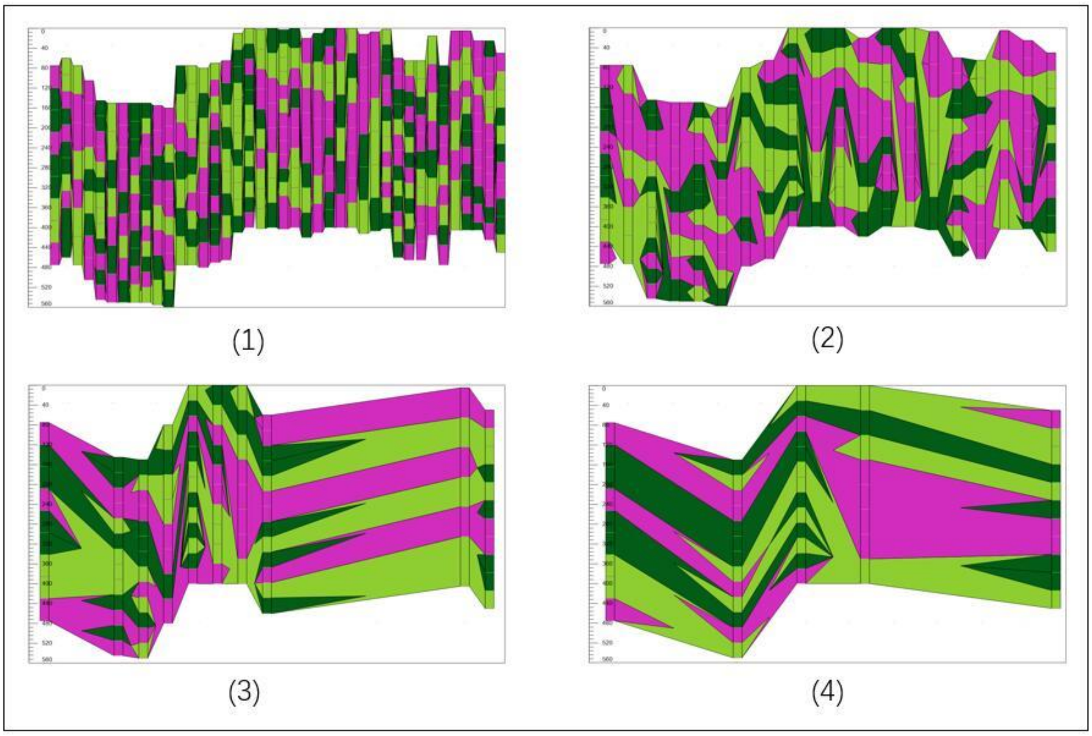

Figure 4 Distribution of salt diagrams.

(1) 40 samples of mines (2) 20 samples of mines (3) 10 samples of mines (4) 5 samples of mines

Too many samples may increase the influence of chance time on the overall sample. By simulating the subsurface map situation several times, we believe that Figure 4(3) reflects the true distribution of subsurface rock layers to a larger extent.

3.2 Project Program Introduction

Based on the topographic map made, we developed the entire project flow and selected four mining sites and corresponding waste disposal sites.

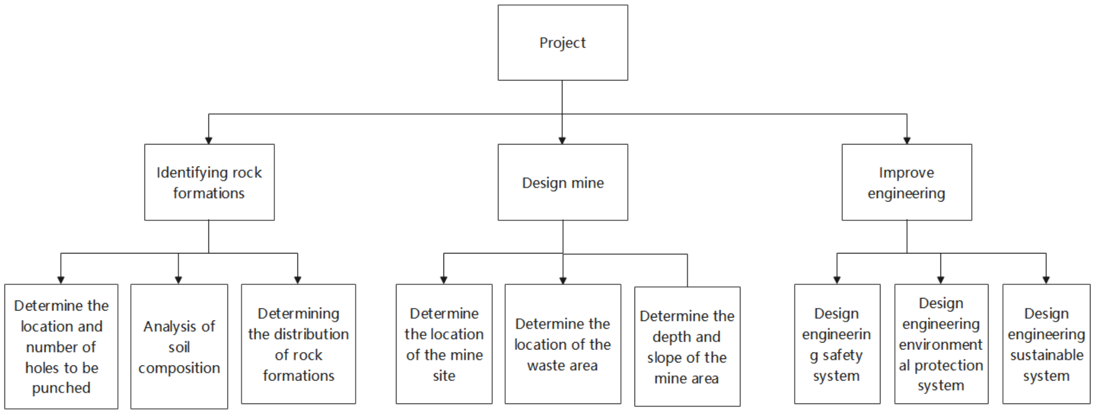

Figure 5 Project division of labor and steps

To make the highest overall evaluation score, we chose the soil composition shown in Table 5. The rock layer type in the rock layer map is the same as the soil color.

Table 5 Soil and corresponding rock formation selection scheme

Netherite	37 - 39	$400
Cavorite	17 - 20	$900
Meteorillium	44 - 49	$500

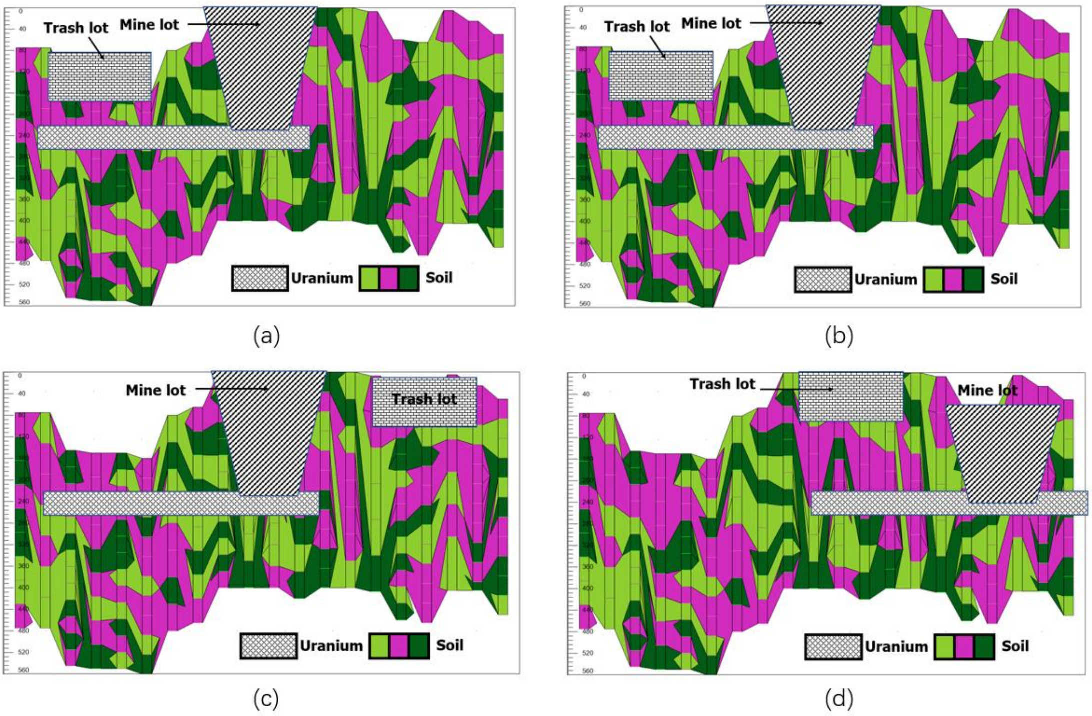

Figure 6 Mining address selection scheme

3.2.1 Method 1

As in Figure 6(a) the mining area is on the left side of the area. The waste area is in the middle of the area. On the left side is to use the basin structure that has itself. On the right side is located to the higher position of the garbage area, which can effectively avoid the pollution of groundwater.

3.2.2 Method 2

As in Figure 6(b) the mining area is in the middle of the area. The waste area is on the left side of the area. On the left side is to take advantage of the basin structure that has itself. On the right side, the mining area is located in a higher position and can take advantage of the flatter stratigraphic structure seen in the area.

3.2.3 Method 3

As in Figure 6(b) the mining area is in the middle of the area. The waste area is on the right side of the area. On the right side is to take advantage of the basin structure that has itself. On the right side is located in the higher position of the come mining area, which can take advantage of the more flat stratigraphic structure seen in the area.

3.2.4 Method 4

As in Figure 6(a) the mining area is on the right side of the area. The waste area is in the middle of the area. On the right side is to use the basin structure that has itself. In the right side is located in the come garbage area is located higher, can effectively avoid the pollution of groundwater.

3.3 Genetic algorithm-based project solution evaluation

Twenty-five evaluation indicators affecting the overall mining scheme of the mine were selected as evaluation factors (see Table 2), and the set of evaluation factors were:

$$X = (x_1, x_2, \dots x_i, \dots, x_n)$$

where X_i denotes the i factor of the program. The evaluation scheme is determined as:

$$y = (\mathrm{y}_1, \mathrm{y}_2, \dots \mathrm{y}_\mathrm{i}, \dots, \mathrm{y}_\mathrm{n})$$

The element y_i indicates the jth option among all evaluation options that participated in the comparison evaluation. The evaluation index values were subsequently standardized .$R(i,j)$ denotes the standard value of the evaluation index after standardization. It also indicates the relative affiliation value of the ith criterion evaluation index subordinated to the superior one in jth scenarios. The matrix is constructed using the normalized values as the basic elements . The matrix is constructed using the normalized values as the basic elements

$$r = [R(i,\ j)]m \times n$$

This matrix is the fuzzy evaluation matrix of the evaluation index. Also set the weights as.

$$A = (w_1, w_2, \dots w_i, \dots, w_n)$$

According to the definition of the judgment matrix, theoretically there are：

$$b_{\bar{k}} = \frac{w_i}{w_k}, (i, k = 1 \sim n),$$

Where w_k denotes the currently calculated weight value. It can be derived that：

$$\sum_{i=1}^{n} \sum_{k=1}^{n} |b_{ik} w_k - w_i| = 0$$

According to the fuzzy mathematical equations $A * R = Z$, The results of the degree of merit of the comprehensive evaluation of the program can be obtained Z :

$$(w_1, w_2, \dots, w_n) \times \begin{bmatrix} r_{11} & \cdots & r_{1m} \\ \vdots & & \vdots \\ r_{n1} & \cdots & r_{mn} \end{bmatrix} = (b_1, b_2, \dots + b_m)。$$

The operation rules are：

$$\begin{cases} (r_{11} \wedge w_1) \vee (r_{21} \wedge w_2) \vee \cdots \vee (r_{n1} \wedge w_n) = z_1 \\ (r_{12} \wedge w_1) \vee (r_{22} \wedge w_2) \vee \cdots \vee (r_{n2} \wedge w_n) = z_2, \\ \vdots \\ (r_{1m} \wedge w_1) \vee (r_{2m} \wedge w_2) \vee \cdots \vee (r_m \wedge w_n) = z_m \end{cases}$$

So the result matrix:

$$Z = (z_1, z_2, \cdots, z_m)$$

Each of these elements represents the degree of superiority or inferiority of the value corresponding to the comprehensive evaluation result of the solution. It can be seen that option 1 is the most appropriate option.

4. Project specific programs

4.1 Task Flow

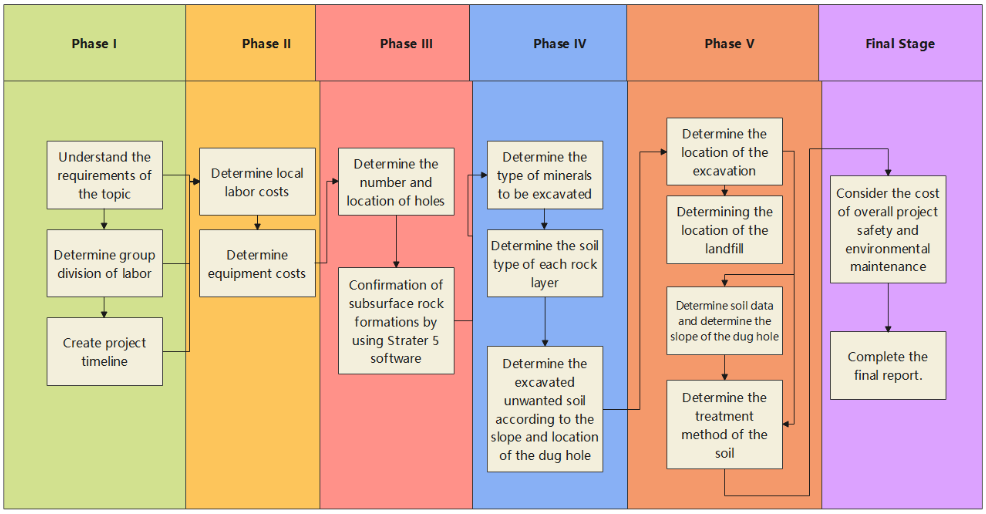

Figure 7 Task flow and main task events

4.2 Task Schedule

Table 6 Overall timing of tasks

Mission	Time (days)
Form a group and get familiar with the group members	2
Determine their roles and clarify their division of labor	2
Teacher explains the methods needed to complete the project	4
Determine the direction of the project	4
Determine customer needs	3
Specify benchmarks	2
Develop and approve product design protocols	4
Developing the original concept	3
Selecting appropriate concepts	3
Define product architecture	2
Complete Purt configuration	4
Assembly analysis for material selection and manufacturing	4
Robust analysis for CTQ requirements	4
Analysis of responsibility and failure using FMEA and root cause analysis	4
Gather local climate information	2
Gathering local human resource information	6
Determine information on the 1,000 meters below the rock formation	4
Determine the lateral distance of the mine and the number of shafts	3
Determine geological information	2
Determine the structure of the pit	4
Determine waste sites and waste reuse options	2
Calculate the budget	2
Purchase of tools and raw materials	4
Calculate human resource costs and hire local manpower	3
Calculate total costs and reconcile budgets	2
Create a complete distribution strategy and master plan	6

4.3 Project Requirements Design

4.3.1 Project equipment and personnel requirements and design solutions

The transportation of open pit mine can take the form of car transportation, rail transportation or belt conveyor transportation, etc. This article introduces the most commonly used car transportation .

4.3.2 Project environment requirements and design solutions

The environmental hazards caused by uranium mining and metallurgy are mainly the following three aspects: solid waste pollution, radioactive radon gas pollution, wastewater pollution, and dust pollution. See Figure 8.

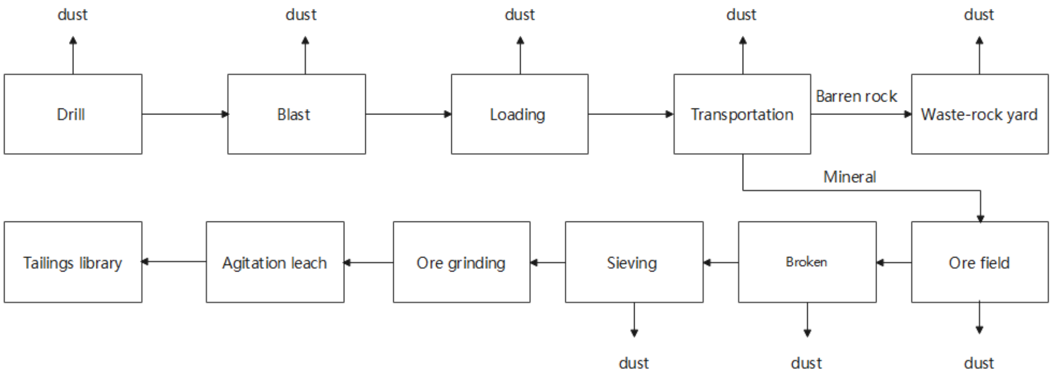

Figure 8 Diagram of dust generation process [6]

To avoid the expansion of pollution. The project is designed to use water-sealed blasting technology, with a dust reduction efficiency of about 66%.[6] . We also use chemical inhibitors to resolve open dust source dust pollution. For engineering purposes, we use the infiltration reaction wall technology. It is perpendicular to the groundwater flow and is capable of blocking the contamination zone and converting the contaminants therein into an environmentally acceptable form without disrupting the flow of the groundwater.

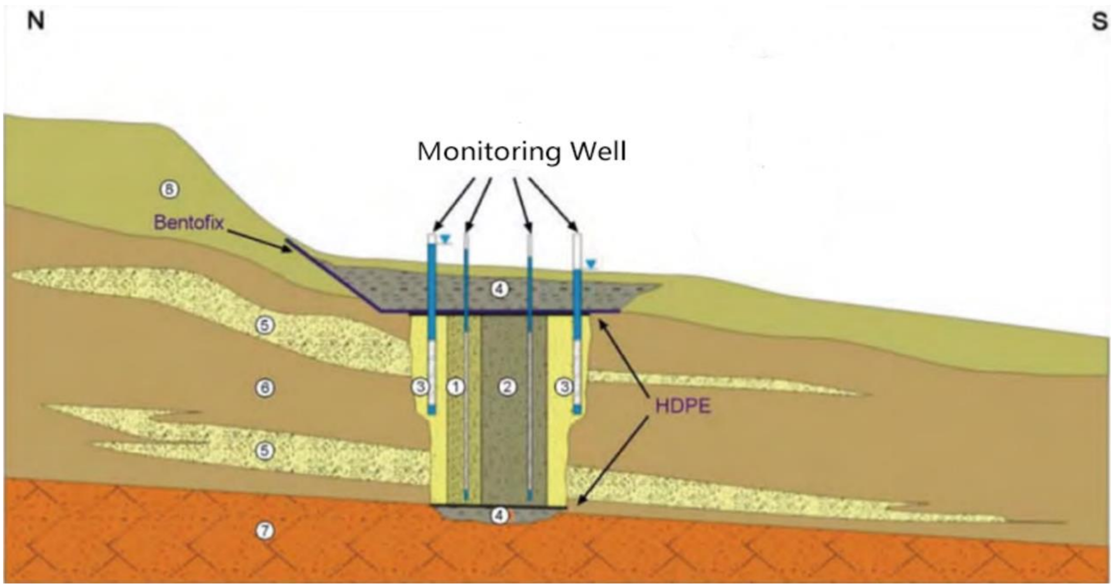

Figure 9 Diagram of the application of permeable reaction wall technology [7]

4.3.3 Project mining requirements and design solutions

Microbial Bioleachingtechnology is used during the construction phase. It is the use of certain microorganisms to separate impurities from the original mineral components [7] [8].

$$4FeS_2 + 15O_2 + 2H_2 - (细菌) \rightarrow 2Fe_2(SO_4)_3 + 2H_2$$
$$SO_4$$
$$FeS_2 + 7Fe_2(SO_4)_3 + 8H_2 \rightarrow 15FeSO_4 + 8H_2SO_4$$
$$FeS_2 + Fe_2(SO_4)_3 \rightarrow 3FeSO4 + 2S$$
$$UO_2 + 2Fe_2(SO_4)_3 \rightarrow 2FeSO_4 + UO_3 + 2S$$
$$4FeSO_4 + O_2 + 2H_2SO_4 \rightarrow 2Fe_2(SO_4)_3 + 2H_2O$$
$$2S + 3O_2 + 2H_2O - (细菌) \rightarrow 2H_2SO_4$$

In view of the various environmental impact factors arising from the application of the project, the topsoil dump and waste rock site should be located in accordance with the "General Industrial Solid Waste Storage and Disposal Site Pollution Control Standards" (GB18599-2001), and garbage bins should be set up at the industrial site, and domestic garbage should be collected and transported to the local domestic garbage transfer station.

4.4 Project Time and Budget

Uranium resources are important energy and strategic materials, and uranium mining projects are highly exploratory and carry huge investment risks. In order to reduce investment risks and decision errors, it is necessary to evaluate the economics of uranium mining projects.

5. Project Modeling and Processing

5.1 Optimization of Optimal Solutions

Based on the results of previous slope stability analyses and studies, some of the main factors affecting slope stability are faults, intra-layer shear zones, groundwater, rock dip, slope geometry and so on. The expert system optimization framework chosen in this paper is basically suitable for building an expert system for any problem. [1].

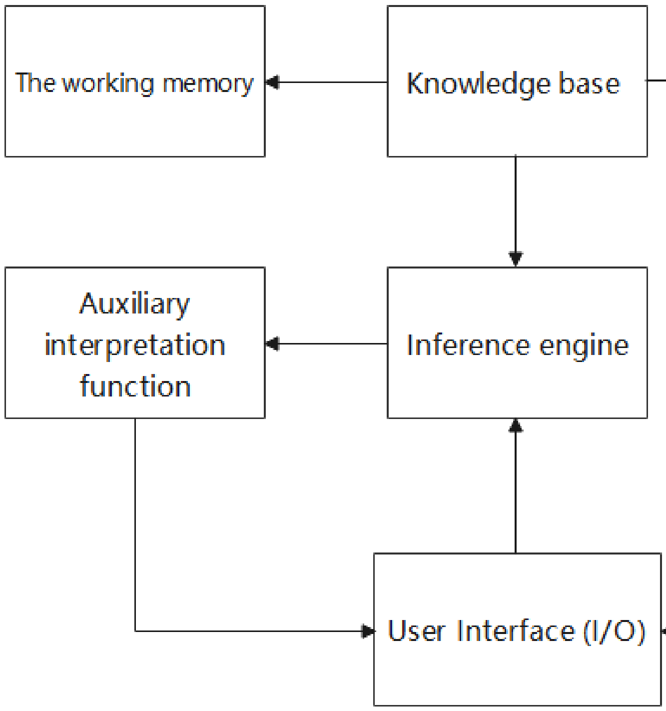

Figure 10　Expert system operation principle diagram

Once the system is running, the following questions are asked and the user selects or answers them in separate screens. We then use the results for specific slope analysis and calculations..

5.2 Slope analysis and calculation

5.2.1 Swedish strip division calculation

The Swedish strip division method assumes that the sliding surface is circular, divides the sliding body into several vertical soil strips, and neglects the interaction forces between the strips. According to this assumption, any soil strip is only subject to self-gravity, shear force and normal force on the sliding surface.

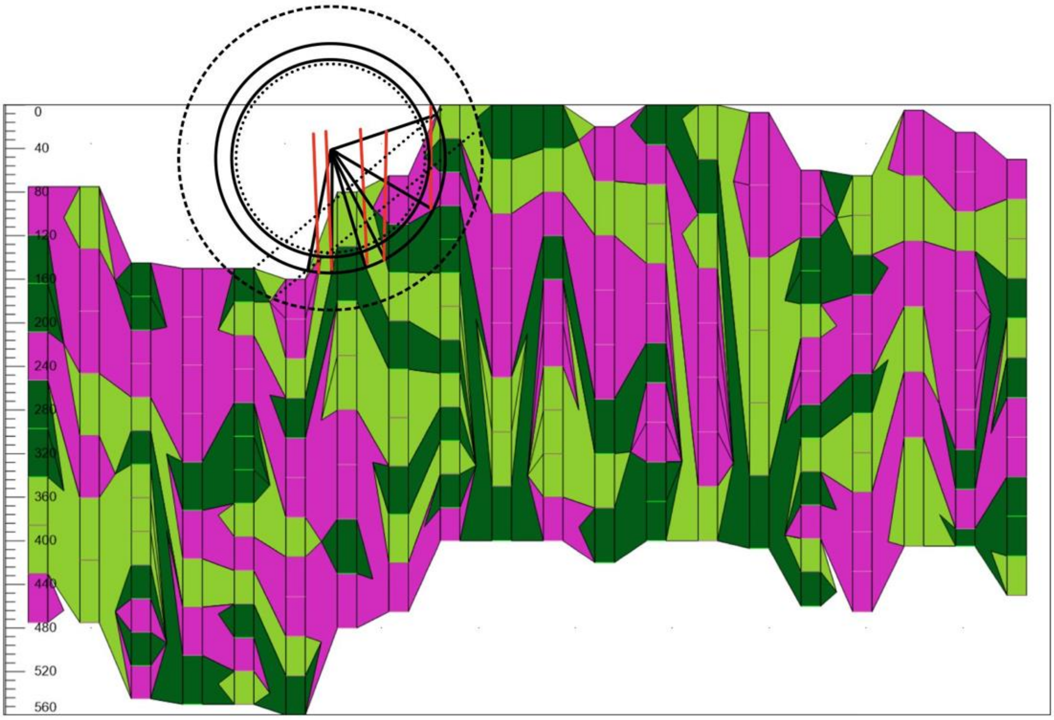

Figure 11 Sketch of Swedish slitting method

Let the safety factor of soil slope be $K\_i,$ which is equal to the safety factor of the ith soil bar.

K_s is the safety factor of soil slope and soil bar.

$$\text{r.}K_s = \frac{\sum_{i=1}^{n}(c_i l_i + F_{Ni}\tan\varphi_i)}{\sum_{i=1}^{n} F_{Wi}\sin\theta_i}$$

The final inferred K_S result is 1.29..

5.2.2 Visual Slope Simulation Analysis

In order to verify the accuracy of the calculation of the slit method and to consider more factors together. We used Visual Slope for simulation. In the simulation model construction, we first constructed the local address case according to the rock layer map. The simulation range was then set. The results obtained in Fig.12.

Where the number of simulation surfaces is 500. both (a) and (a) in the figure indicate the best six simulation surfaces for the computer simulation results. The green side slope in the figure has the highest stability. And we have applied plane forces on the sliding surface in figure (d) to simulate the effects in engineering operations..

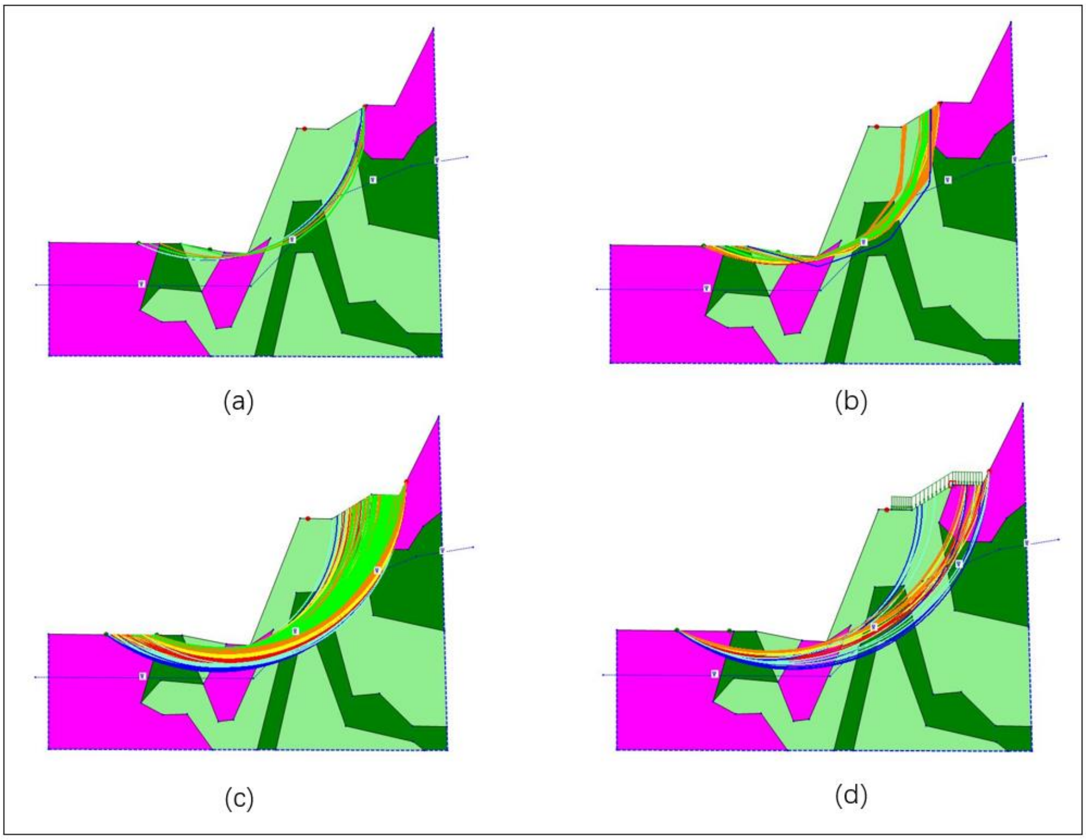

Figure 12 Simulation of the slope safety factor of the right mine boundary

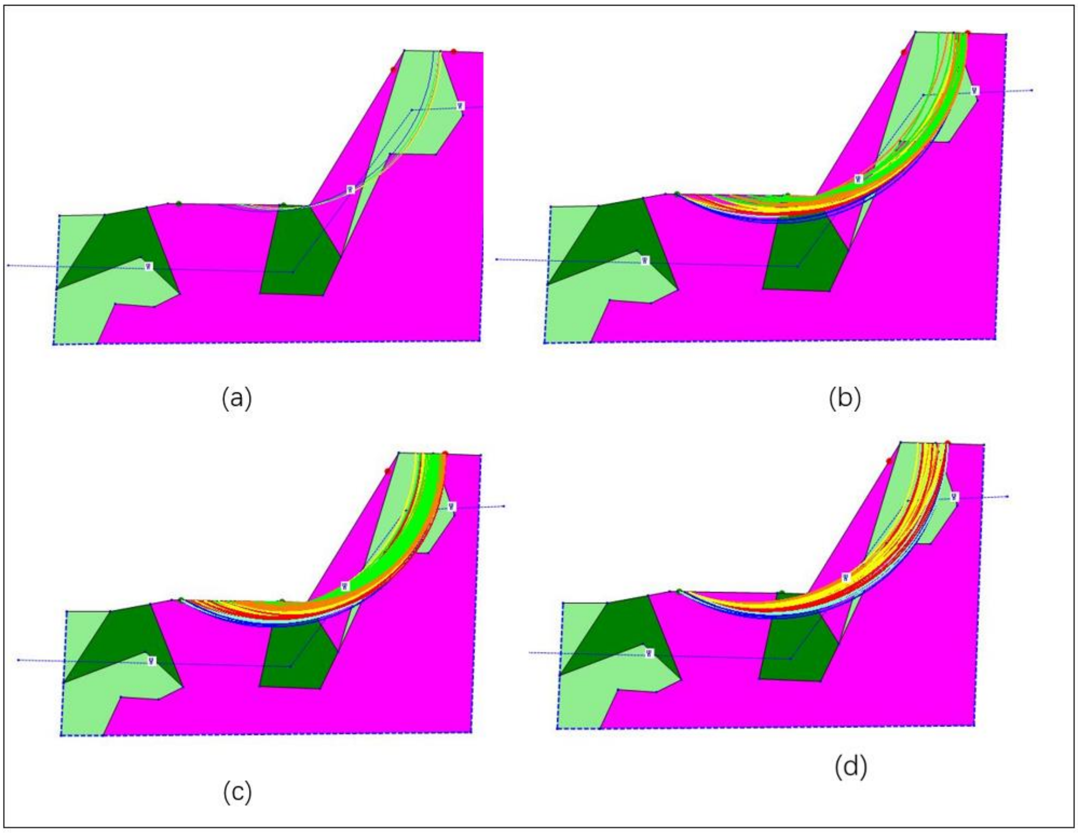

Figure 13 Simulation of the slope safety factor of the left mine boundary (mirror flip)

The results differ from our results in 5.2.1 by 2 to 5%. Within our allowed error range.

We then performed precipitation simulations to simulate the conditions of our selected broken surface in each environment. Due to the limited soil data, we performed preliminary analyses based mainly on the distribution of rock layers. The results of the analysis for both slopes are shown in Fig 14.

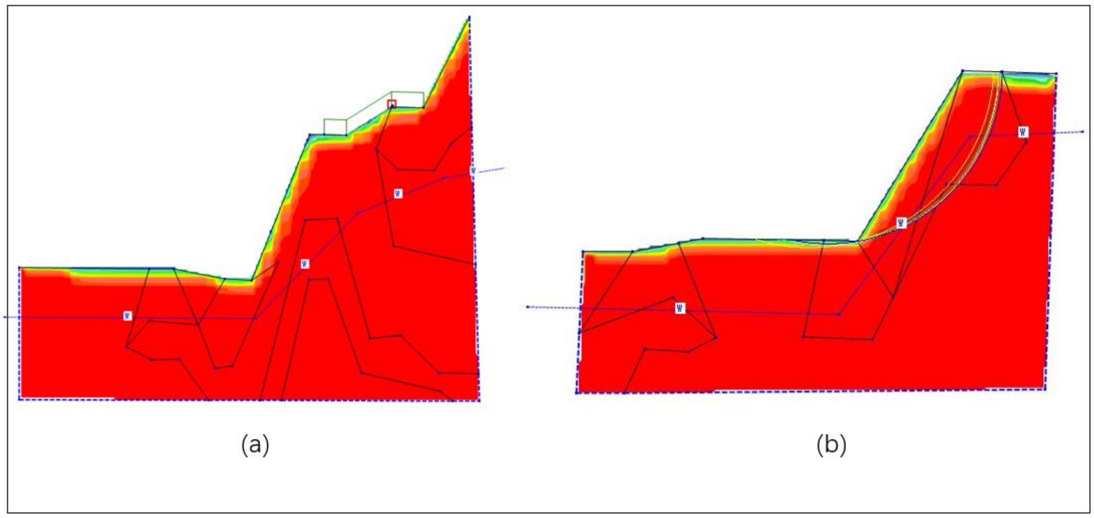

Figure 14 Water seepage from both sides of the slope

The results show that the water layer is weakly permeable. The chance of mudflow is low, but it is easy to produce water accumulation in low-lying areas, which requires us to strengthen the drainage capacity in the open pit.

5.2 Economic budgeting and revenue forecasting

In uranium resource development, the long construction period and payback period of the mine project and the large number of uncertainties embedded in it result in a great deal of uncertainty as to whether the investment expenditures will achieve the expected benefits. For the whole project economic budget and predictable benefits, we use the real option method to forecast. It states that the profit generated by the cash flow from an investment program comes from the use of currently owned assets, plus an option for future investment opportunities. The improved NPV method based on the real options view is expressed as follows [9]:

$$Strategic\ value\ NPV_T = Traditional\ NPV\ Forecast\ Cash\ Returns$$
$$+ V\ Value\ of\ options\ included\ in\ the\ project$$

Judgment criteria:

$$NPV_T > 0\ Project\ feasibility$$
$$NPV_T < 0\ The\ project\ cannot\ be\ implemented.$$

We use the Binomial Model power pricing method to determine the economic benefits of the entire project. The specific steps are as follows [10]:

Assume that the upside factor is u, the downside factor is d, σ is the annual volatility of the price, and t is the time to maturity. Then.

$$u = \exp\left(\sigma\sqrt{t}\right) \approx \sigma\sqrt{t} + 1$$
$$d = \exp\left(-\sigma\sqrt{t}\right) \approx -\sigma\sqrt{t} + 1$$
$$p = \left(\mathrm{e}^{(r-\sigma)t-d}\right)/(u-d)$$

According to the Binomial Model, then we have:

$$V_u = \mathrm{e}^{-rt}[\mathrm{pV}_{uu} + (1-p)V_{ud}]$$
$$V_d = \mathrm{e}^{-rt}[\mathrm{pV}_{ud} + (1-p)V_{dd}]$$
$$V = \mathrm{e}^{-rt}[\mathrm{pV}_u + (1-p)V_d]$$

V_{uu}、V_{ud}、V_{dd} They represent the prices of the right to have consecutive periods of rising, rising and then falling values (first falling and then rising) and consecutive periods of falling project values, respectively; Vu and Vdd represent the prices of the right to have rising and falling project values at the end of the first period, respectively. Based on the uranium mine data for the last 10 years, combined with the size of the uranium mine area (hexahedron is used for the volume. Then the expected return reaches 134.421% of the total investment [10] .

6. Project evaluation improvement and replication

6.1 Evaluation

The comprehensive uranium evaluation index is highly scalable and transferable. It can be applied to multiple aspects.

Expert evaluation optimization can significantly reduce programming time, and the knowledge representation in the knowledge base is entirely in natural English language form. The binomial tree pricing model is intuitive and easy to understand, easy to apply, and easy to list various outcomes with uncertainty and/or with decisions. In principle, it can handle any complex option problem.

6.2 Improvement and Promotion

Strengthen environmental protection and governance to promote sustainable development of uranium mining and metallurgy. Promote land reclamation and mining activities simultaneously. Improve legislation and policy support. Improve the compensation mechanism for environmental costs of green uranium mining and metallurgy. Improve mine safety and security measures and establish employee health records.

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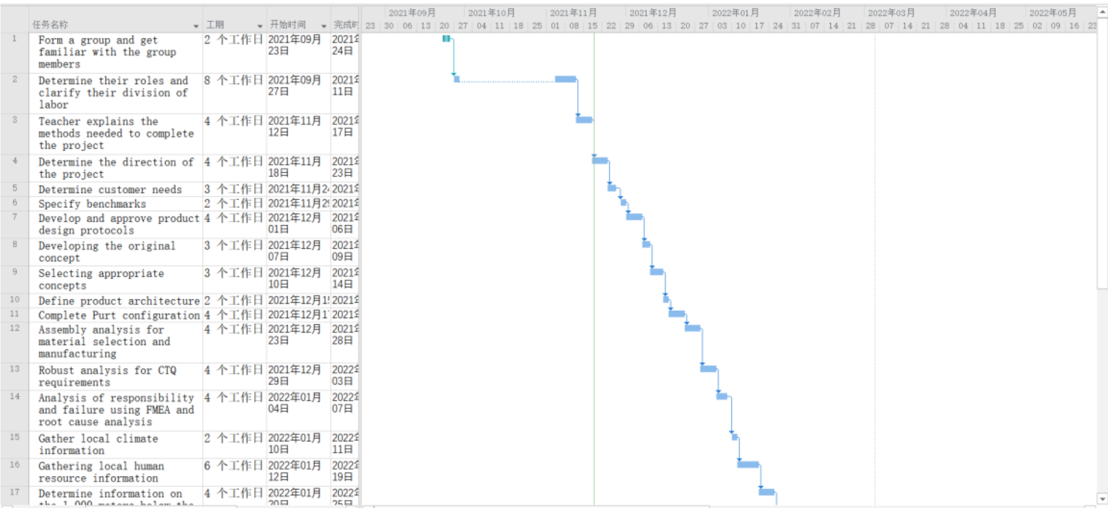
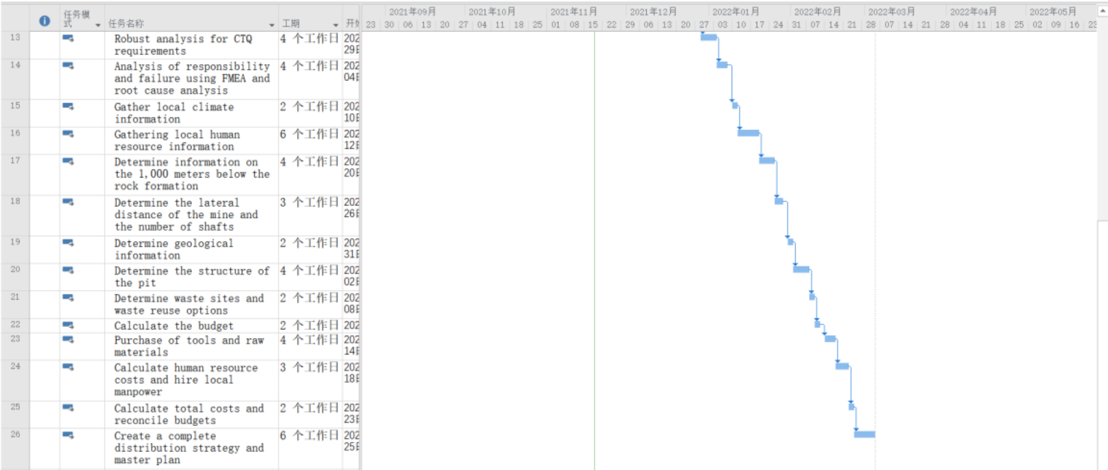
Appendix

Gantt Chart





		任务模式	任务名称	工期	开始
13			Robust analysis for CTQ requirements	4 个工作日	202 29
14			Analysis of responsibility and failure using FMEA and root cause analysis	4 个工作日	202 04
15			Gather local climate information	2 个工作日	202 10
16			Gathering local human resource information	6 个工作日	202 12
17			Determine information on the 1,000 meters below the rock formation	4 个工作日	202 20
18			Determine the lateral distance of the mine and the number of shafts	3 个工作日	202 26
19			Determine geological information	2 个工作日	202 31
20			Determine the structure of the pit	4 个工作日	202 02
21			Determine waste sites and waste reuse options	2 个工作日	202 08
22			Calculate the budget	2 个工作日	202
23			Purchase of tools and raw materials	4 个工作日	202 14
24			Calculate human resource costs and hire local manpower	3 个工作日	202 18
25			Calculate total costs and reconcile budgets	2 个工作日	202 23
26			Create a complete distribution strategy and master plan	6 个工作日	202 25

Code：

```
# Opens the specified data file
datasheet = read.table("input.csv")
# Import data from a file to a variable
R=datafile['R']#radius
S=datafile['s']#
W=datafile['W']#
su=datafile['su']#The shear force of soil
ma=datafile['ma']#
theta=datasheet['the']#angle
# Calculated shear
lengths = length(Sud)
sud=theta*su=
Sud=as.vector(unlist(sud))
# Calculated gravity moment
m_1=as.numeric(lengths)
M_1=W*ma*S*1
M=as.vector(unlist(M1))
m_2=as.numeric(lengths)
if(FALSE){
  # And we start to loop
  # until we get to the optimal solution
}
t=0
K=1
while(K<=m_1)
{
  t=t+Sud[K]
  K=K+1
}
if(FALSE){
  # And we start to loop
  # until we get to the optimal solution
}
t=0
K=1
```

```
while(c<=m_2)
{
  t=t+M[K]
  K=K+1
}
r_1=r1[1]
r_2=as.vector(unlist(R))
r_1=as.numeric(r)
# Calculate slope stability
Fos=1/2*r*r*pi*2/180*t/t
if(Fos<1){
  print("High risk")
}else if(Fos>=1&&Fos<=2){
  print("Stable result")
}else{
  print("Very stable.
It is recommended to increase
the slope to reduce economic consumption")
}
```