

**APPROVED: Head of Policy Regulation Department,
Ministry of Environment**

..... /Ts. Damdin/

**ENVIRONMENTAL PLAN AND MONITORING PROGRAM
OF OYU TOLGOL, MANAHT, HUH HAD AND ULAAN UUL AREAS,
UMNU-GOBI AIMAG, HANBOGD SOUM, FOR 2004**

**Reviewed and Received
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Ivanhoe Mines Mongolia Inc.
Ulaanbaatar
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IVANHOE MINES MONGOLIA INC.

Governor of Hanbogd soum, Umnu-Gobi

.....**D. Buyntogtoh**

Environmental Inspector

.....**Sanjmyatav**

ENVIRONMENTAL PLAN FOR 2004

Ulaanbaatar

ENVIRONMENTAL PROTECTION PLAN FOR OYU-TOLGOI, MANAHT, HUH-HAD AND ULAAN-UUL PROPERTIES

THE PROJECT DESCRIPTION

/January 2004/

1. General information

1.1. Project Name

Detail geological study on Oyu Tolgoi property, Hanbogd sum, Umnugobi aimag.

1.2. The Purpose of the Project

- To expand the geologic structural understanding of Oyu Tolgoi, Manaht, Huh had, Ulaan uul licensed areas,
- To find out expansion logic of their ore minerals and determine the inferred resources, and
- To obtain additional data and information to be used for preparation and assessment of mining methods to exploit the deposit.

In early 2004 Ivanhoe plans to continue underground exploration development of the copper occurrences (north, central and south portions of the Oyu Tolgoi) that apply to the exploration license #66 of Ivanhoe, to take technological samples from the ore body and raise classification of the resources. The Environmental Plan for the underground developments is described in detail in the second part of this document.

1.3. Outcome of the Project

- Report on geological mapping work of Oyu Tolgoi deposit
- Resource report of the deposit

1.4. Official address of the Project Implementing Organization

The project will be carried out by Ivanhoe Mines Mongolia Inc.

Ikh – Zasag Avenue, Building - 6

Sukhbaatar district, Mongolia

Phone: (976-11) – 310785; 312289; 310775

Fax: (976- 11) – 312337

1.5. Equipment

Ivanhoe plans to conduct the geological exploration work on its licensed areas with help of Ivanhoe's geological personnel and contractors and involvement of local and western laboratories and expert companies. The detailed geological study of the Oyu Tolgoi deposit includes a total of 200 run/km diamond drilling in 1000 m holes and geological traverses on Manaht, Huh-had and Ulaan-uul properties. Also geochemical analyses will be carried

out on samples taken from rock outcrops and drill cores. The total volume of the exploration work is presented in the 2004 exploration work program.

1.6. Infrastructure (currently available)

None

1.7. Other projects and works in the region

Several other companies including Mongol Gazar are running geological exploration projects in this region. The company carries out exploration works not only in Oyu-Tolgoi area but covers some portions of Huh-had, Manaht and Ulaan-uul areas that had been under Ivanhoe's license in the past.

1.8. Project Schedule

The work will commence early in 2004 and be completed in Nov-Dec, 2004. Any major changes to the exploration program during 2004 will be communicated to the relevant government agencies prior to the commencement of work.

An Environmental Impact Assessment (EIA) report for the development of the Oyu Tolgoi deposit is being prepared by "ECO-Trade" and will be submitted to the Mongolian Government during 2004. The EIA is being prepared in accordance with guidelines issued by the Mongolian Ministry of Nature and Environment in March 2003.

When completed, the EIA will include the Environmental Management Plan (EMP) for the project. The EMP will detail how Ivanhoe will manage the environmental impacts of the project, including the controls and procedures that will be put in place.

2. Economic parameters

2.1. Investment

Water hole drilling:

Gunii Hooloi and Naran Zag - 10 holes,
Galbiin gobi – 16 holes.

Prior to drilling, 72m³ sumps are excavated for each hole. Detailed data of the water drilling project is presented in a table and appended to this document.

Expenses:

To rehabilitate water sumps:

1. $26 \times 72\text{m}^3 \times \text{MNT}524,8 = \text{MNT}982,425$

To rehabilitate 55 sumps remaining from previous year.

2. $55 \times 72\text{m}^3 \times \text{MNT}262,4 = \text{MNT}1,039,104$

Total expenses for water hole drilling:

$7809 \text{ run/m} \times \text{USD}300,0 = \text{USD}2,342,700$

Reclamation of exploration drill sumps

3. $200 \times 5 \text{m}^3 \times \text{MNT}524.8 = \text{MNT}524800$

Total expense to rehabilitate all sumps

$982,425 + 1039104,0 + \text{MNT}524800 = \text{MNT}2546329$

4. Water used for dust suppression on roads and during earthworks MNT600.00

5. Waste disposal and cleaning expense is MNT853671.0

6. Total expense for the protect nature environment in 2004

$1 + 2 + 3 + 4 + 5 \text{ species} = \text{MNT}4000,000$

2.2. Operational Expenditure

The operational expenditure consists of labor charges, license fees, camp costs, transportation fees and environmental costs.

2.3. Costs related to environmental activities

All vehicles and equipment associated with the project will utilize the existing road network, thus limiting the potential for further land and soil degradation. Existing roads cover a length of 100 km. Roads and tracks that are no longer used will be progressively closed and rehabilitated during 2004.

Some land disturbance, associated with drilling equipment and heavy machinery, is expected. Drill sites will be rehabilitated as soon as practicable after they have been vacated. Total required amount of reclamation for 26 water hole drilling programme at Oyu Tolgoi is MNT982,000.

2.4 Annual expenditure for environment protection activity

In 2004 MNT 4,0 million will be spent for environmental work. According to article 30.11 of the Minerals Law of Mongolia, Ivanhoe is required to deposit an amount equal to 50% of its environmental budget into a special bank account opened by the relevant soum Governor. This deposit is made to ensure Ivanhoe discharges its responsibilities with respect to environmental protection. This deposit shall be refunded to Ivanhoe upon full implementation of its environmental protection plan .

2.5. Environmental fee and charge

In accordance with appropriate laws and regulations of Mongolia, required contracts will be established with relevant state or local authorities and transportation fees, land and water usage fees will be paid. Total payment is approximately MNT 6.0 million (based on 2003 data).

3. Project Operation and Implementation

3.1. Operation /technology/ scheme

The objective of this exploration study is to obtain additional geological data to compile detailed geological maps and schemes.

3.2. Raw and auxiliary materials

a/ Natural Resources

Approximately 460 personnel will work on the exploration project of Oyu Tolgoi, Manaht, Huh Had and Ulaan uul areas for 360 days. Water consumption is estimated as 50 l/sec per/person and 8m³ per/day for drilling.

Description	Amount	Source
Fresh water (drinking)	165600 men/day*0,05M ³ = 8280 M ³	Water well, spring
Technical water (drilling)	1200 drill/day*5M ³ = 6000M ³	Water well, spring

3.3. Disposal and transitional materials

a/ Transitional materials

Description	Amount	Source
None		

b/ Solids disposal

Description	Amount	Source
Cans, bottles, bones	2 tonnes	Food containers

c/ Liquid disposal

Description	Amount	Source
Sewage	1070M ³	Kitchen, showers, toilets

4. Monitoring and Management of Disposal Materials

4.1. Disposal method

a/ Solids disposal

Description	Cleaning	Method
Cans, bottles, bones	constantly	Deliver to garbage & waste disposal site

b/ Liquid disposal

Description	Cleaning	Method
Sewage /discharge from showers, kitchen & toilets/	constantly	Deliver to water discharge site

4.2. Radio active disposals and their removal

Description	Cleaning	Method
None		

5. Social profile for labor force

5.1. Number of employees, classification of occupation

Field camp consists of camp manager, geologists, cooks, drivers and contract workers.

5.2. Labor force source

Ivanhoe's Mongolian and western employees, experts and contract workers.

5.3. Working condition of the employees

Ivanhoe will provide the employees with meals (three times a day), transportation, living facilities and communication. A physician will work at the camp at all times and necessary first aids, drugs, medicines and some medical devices are available at the camp. The company will be responsible for social and medical insurances of its employees.

6. Description of the region

This region is very sparsely populated and far away from aimag and soum centers. Infrastructure of the region is poorly developed. Oyu Tolgoi is located 45km from Hanbogd soum center. There are food stores and a hospital, post office and gas station in the center of the soum.

6.1. Air pollution /parameters

There is no air pollution in the area however year round dry and windy weather causes exceedingly dusty air.

6.2. Water contamination /surface and underground water parameters

No significant water pollution is reported. Some shallow wells may have been polluted with nutrient from livestock. Water is generally highly mineralized and not suitable for drinking, thus constant water analysis is required.

6.3. Soil contamination

Soils within the licence are not contaminated. However, soil degradation has occurred locally from exploration activity including roads and drill sites. Regionally, soils are impacted from grazing activity and wind erosion.

6.4. Climate

Spring is usually windy and dust storms occur frequently. Temperatures in summer reach a maximum of +36° and in winter can drop to a minimum of -31°. Average annual precipitation is 80 mm.

6.5. Geography /geological structure/

The project area belongs to the Gobi region and has a desert landscape. The land is characterized by flat to hilly structures. The entire area has been geologically mapped at a scale of 1:200,000. Some areas have been mapped at 1:50,000.

6.6. Land use

Due to its natural features the land is not favorable for any other agriculture use except pasture.

6.7. Vegetation

Although vegetation cover of the region is sparse it is nutritious. Shrubs are the main vegetation type in the area. Elms occur along creeks and wormwoods cover the hills. Grasses predominate in lowlands.

6.8. Forest

There is no forest in the region.

6.9. Historical and archeological resources

Several historical sites (5000-6000 years old) were found during archeological study carried out in 2001-2002.

6.10. Social and economic profiles

Economically the region is poorly developed and stock farming is the main livelihood of the local people.

7. Environmental policy

Ivanhoe will act as follows:

1. Follow all requirements stated in effective laws and regulations regarding sanitation and hygiene and maintain clean residential areas and take preventive steps from further contamination.
2. Dispose and discharge any garbage and other wastes exclusively in special sites designated by Governor of Han-bogd soum in 2003. The area of the waste disposal facility is 4000m². Prior to disposal garbage will be classified and collected in special containers.
3. Take preventive steps from contamination of water sources including water wells and springs.
4. Prepare a specific site for all vehicles, heavy machinery and equipment to manage fuel and oil spills.
5. Take all preventive measures from possible fire accident. Fire team to obtain and review rules and regulations relevant.
6. The overburden from the 37000m³ of excavated rock will be located separately to be used for future rehabilitation. The waste rock dump will be 5m high x 90m long x 90m wide and located 2km east of the decline at coordinates of N- 4.766300, E- 651,200. To mitigate dust impacts from the waste rock landform, an area of 8100m² will be covered with crushed rock to a depth of 10 cm, using a total volume of 810m³.
7. A total of 132768 m³ of waste water from shower and laundry facilities will be used to wet roads to control dust.
8. Continue the historical and archeological study and protect any sites and finds.
9. Collaborate with local authorities and public organizations on environmental issues and prepare and follow required plans and reports.

All effective environmental laws and regulations of Mongolia, the company's policy on environment as well as Environmental Assessment Reports, prepared by ECO-Trade Co., Ltd were used to present this report.

Environmental protection plan of Oyu Tolgoi deposit for 2004

№	Description	Duration	Responsible person
1	Report compiling environmental protection plan for 2004	December	Engineer Environment at Oyu tolgoi
2	Preparation of environmental plan for 2004 and approval from relevant state authorities	January	Engineer Environment in UB
3	Complete Environmental Impact Assessment report	April	ECO-Trade Co., Ltd and Ivanhoe's Environmental Engineers
4	To rehabilitate sumps	within 2004	Engineers
5	Water earthworks and roads to prevent dust	Constantly	Mining Engineer
6	Crush rocks from excavation	Jun, Jul, Aug, Sep, Oct, Nov	Mining Foreman
7	Construct waste rock landform (bulldozer and other earthmoving equipment)	Within 2004	Engineer Environment, Mining Engineer, personnel
8	Rehabilitate waste rock landform (topsoil placemen and rock armouring)	Within 2004	Engineer Environment

2. ENVIRONMENTAL PROTECTION PLAN FOR UNDERGROUND EXPLORATION WORK

General

The purpose of the plan is to comply with the requirements stated in appropriate laws and regulations of Mongolia and exploration and environmental policies of Ivanhoe when conducting underground exploration work at the Oyu Tolgoi deposit. This plan will provide guidance for environmental protection methods and environmental management operations for performing the work.

The environmental aspects associated with the underground exploration work, which is planned to be carried out at the Oyu Tolgoi deposit in 2004, are specifically presented in this plan.

All exploration work to date has consisted of drilling from surface but Ivanhoe has concluded that there is a need for further exploration work to be carried out underground.

Ivanhoe is considering constructing a decline or a shaft to carry out the underground exploration work. The following jobs will be conducted during the underground work:

- Large scale technological samples to determine refining ability of the ore
- Geological drilling to raise the classification of the Resource from Inferred to Indicated,
- Geological mapping of the deposit in more detail,
- Gathering geotechnical rock strength data to verify and complete the geotechnical models that have been created,
- Gathering data to enable mine planning personnel to evaluate the suitability of the mining methods that have been proposed to exploit the deposit.

Geological studies are regulated by appropriate laws and regulations of Mongolia including “Mineral Law” and “Law on Underground Space”. To prepare this plan Ivanhoe has studied the laws and followed the instruction of the laws.

1. The purpose of underground exploration

The underground exploration work has two distinct purposes listed below.

1. To gain information

- Geological structural information will be gained by drilling from underground,
- Geological grade information will be verified by taking bulk samples to compare with interpolated drill grades,
- Geotechnical information will be gained from underground mapping and drilling,
- Mining method information will be gained by viewing the rock on a macro scale and by actual size,
- Metallurgical extraction information will be gained from taking bulk samples,
- General mining information will be gained to demonstrate that Oyu Tolgoi is a physically feasible and economically profitable project.

2. To gain early access to the deposit to enable the ore to be mined earlier than would be possible without it.

2. Regulations

In all underground activities the Mongolian Underground Regulations will be followed as a minimum standard. Where Ivanhoe believes that more stringent regulations are required, the Western Australian Mines Safety and Inspection Regulations will be applied.

3. Decline Dimensions

The final size of the Oyu Tolgoi decline is planned to be 5.5m wide x 6m high, after ground and surface supports have been installed.

The width of 5.5 meters will be enable 50 tonne trucks to be used and total clearance of 1.8 meters to be maintained. The height of 6 meters will enable 50 tonne trucks to be used with room for 1400mm ventilation bag to be installed without catching on the trucks.

A total of 25000m³ of overburden will be separately placed for further rehabilitation work. A waste rock dump will be constructed, with dimensions of 15m height x 109m length. The final landform will be rehabilitated to prevent dust lift-off and encourage vegetation establishment.

4. Shaft Dimensions

A shaft is being considered for additional underground exploration work. The proposed shaft will be 520 metres deep and 8.1 metres in diameter. The total volume of rock extracted would be 25000m³, which will swell by a factor of 1.4, to produce a total of 37000m³.

The shaft will be located on exploration lease no. 66x at the approximate coordinates of N-4.766300, E- 651,200. The waste rock dump will located 2km from the shaft. The waste dump will be 5m high x 90m long x 90m wide, with a total volume of 41500m³. An area of 8100m² will be covered with crushed rock to a depth of 10 cm, using a total volume of 810m³.

5. Water Supply

Raw water will be supplied to all areas of the decline for wet drilling (for dust control), and washing down. The supply line will be 110mm HDPE pipe.

Some water is expected to flow into the operations from groundwater inflow, drilling water and wash down water. The total average flow is expected to be less than 4 liters/second. Pumps or drains will be supplied, or made available, to all areas where water may flow to, and water will be pumped from the mine to prevent it from accumulating. Water will be pumped to a settling sump on the surface and recovered for use around the site.

PREPARED

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