

**Part I. LEGAL DOCUMENTS**

*2007/ND-CP of December 27, 2007, defining the functions, tasks, powers and organizational structure of the Ministry of Industry and Trade;*

**THE MINISTRIES**

*Pursuant to the Government's Decree No. 160/2005/ND-CP of December 27, 2005, detailing and guiding the implementation of the Law on Minerals and the Law Amending and Supplementing a Number of Articles of the Law on Minerals;*

**THE MINISTRY OF INDUSTRY AND TRADE**

**DECISION No. 41/2008/QĐ-BCT OF NOVEMBER 17, 2008, APPROVING THE PLANNING ON ZONING OF AREAS FOR EXPLORATION, MINING, PROCESSING AND USE OF INDUSTRIAL MINERALS (SERPENTINE, BARITE, GRAPHITE, FLUORITE, BENTONITE, DIATOMITE AND TALC) UP TO 2015, WITH A VISION TOWARD 2025 TAKEN INTO CONSIDERATION**

*In furtherance of the Prime Minister's opinions in the Government Office's Official Letter No. 3174/VPCP-CN of June 11, 2007, empowering the Ministry of Industry (now the Ministry of Industry and Trade) to approve the Planning on zoning of areas for exploration, mining, processing and use of industrial minerals (serpentine, barite, graphite, fluorite, bentonite, diatomite and talc) up to 2015, with a vision toward 2025 taken into consideration;*

**THE MINISTER OF INDUSTRY AND TRADE**

*Considering Report No. 275/VMK-B1 of June 27, 2008, of the Institute of Mining-Metallurgy Science and Technology;*

*Pursuant to the March 20, 1996 Law on Minerals and the June 14, 2005 Law Amending and Supplementing a Number of Articles of the Law on Minerals;*

*At the proposal of the directors of the Planning Department and the Heavy Industry Department,*

*Pursuant to the Government's Resolution No. 59/2007/NQ-CP of November 30, 2007, on a number of solutions to problems arising in construction investment activities and reform of some administrative procedures applicable to enterprises;*

*Pursuant to the Government's Decree No. 189/*

**DECIDES:**

**Article 1.-** To approve the Planning on zoning of areas for exploration, mining, processing and use of industrial minerals (serpentine, barite, graphite, fluorite, bentonite, diatomite and talc) up to 2015, with a vision toward 2025 taken into consideration, with the following principal contents:

### I. Development viewpoints

- To develop the industry of mining and processing of industrial minerals (serpentine, barite, graphite, fluorite, bentonite, diatomite and talc) in line with the planning on Vietnam's industrial development and local socio-economic development plannings, ensuring harmony between national and local interests, meeting defense and security requirements, and protecting valuable cultural works and the eco-environment in localities where minerals are available;

- To develop the industry of mining and processing of industrial minerals in a stable and sustainable manner, with advanced technologies, ensuring safety and economic efficiency, in order to rationally and economically exploit and use the country's natural resources;

- To implement exploration projects in order to have reliable sufficient reserves for the formulation and implementation of projects on mining and processing of industrial minerals in the planning periods;

- To develop the industry of mining and processing of industrial minerals on the basis of natural resource advantages and mainly internal

resources in order to meet demands of the economy first and export only processed and surplus products.

### II. Development objectives

- To concentrate on exploring surveyed and assessed mines of industrial minerals (serpentine, barite, graphite, fluorite, bentonite, diatomite and talc) in order to have reliable sufficient reserves for mining and processing in the planning periods;

- To meet the domestic demand for, and export a rational quantity of, industrial minerals (serpentine, barite, graphite, fluorite, bentonite, diatomite and talc);

- To recover to the utmost natural resources in mining and processing activities through the application of advanced technologies. To ensure economic efficiency of mining and protect the eco-environment in localities where mining is carried out;

- To step up coordinated investment in establishments which conduct deep processing of industrial minerals with advanced technologies.

The output of commodity ores is projected as follows:

| Category   | Unit of calculation | 2010 | 2015 | 2020 | 2025 |
|------------|---------------------|------|------|------|------|
| Serpentine | thousand tons/year  | 300  | 500  | 600  | 600  |
| Barite     | thousand tons/year  | 250  | 350  | 400  | 500  |
| Graphite   | thousand tons/year  | 20   | 25   | 30   | 35   |
| Fluorite   | thousand tons/year  | 200  | 220  | 235  | 250  |
| Bentonite  | thousand tons/year  | 80   | 125  | 175  | 250  |
| Diatomite  | thousand tons/year  | 200  | 260  | 500  | 600  |
| Talc       | thousand tons/year  | 40   | 80   | 150  | 200  |

### III. Forecasts about serpentine, barite, graphite, fluorite, bentonite, diatomite and talc needs

The needs for (processed) commodity ores of industrial minerals are forecast as follows:

| Category   | Unit of calculation | 2010 | 2015 | 2020 | 2025 |
|------------|---------------------|------|------|------|------|
| Serpentine | thousand tons/year  | 300  | 500  | 600  | 600  |
| Barite     | thousand tons/year  | 250  | 350  | 400  | 500  |
| Graphite   | thousand tons/year  | 20   | 25   | 30   | 35   |
| Fluorite   | thousand tons/year  | 200  | 220  | 235  | 250  |
| Bentonite  | thousand tons/year  | 80   | 125  | 175  | 250  |
| Diatomite  | thousand tons/year  | 215  | 315  | 500  | 600  |
| Talc       | thousand tons/year  | 40   | 80   | 150  | 200  |

Note: The needs are calculated for both imported and exported quantities.

### IV. Exploration planning

#### 1. Exploration for serpentine ores

The identified and forecast reserves of serpentine ores are around 37 million tons.

From now to 2015, to implement projects on additional exploration for serpentine in Nui Nua, Thanh Hoa province and Thuong Ha, Lao Cai province, and explore Te Thang mine, Thanh Hoa province.

The total investment capital for projects on exploration and additional exploration for serpentine from now to 2015 is estimated at VND 35-50 billion.

Statistics of forecast reserves and resources and a list of projects on exploration for serpentine ores are provided in Appendices 1 and 2.

#### 2. Exploration for barite ores

- The identified and forecast reserves of barite ores are around 26 million tons;

- From now to 2015: To explore prospective, large-sized and high-content mines which are easy to exploit in order to design their extraction, specifically ore mines and spots of Che Pen, Na Ke, Ban Vai and Ban Ran (Cao Bang) with B+C1-level reserves projected at 0.8 million tons.

- To explore barite mines in Tuyen Quang region in order to identify the remaining reserves of the whole region.

- To explore mine spots in Doan Hung district, Phu Tho province.

- For barite ores in rare earth ores, to explore and extract barite ores only when there is a demand for rare earth ores. In the immediate future, to explore Na Cua mine of which barite and fluorite reserves have been identified.

The investment capital for barite exploration is estimated at VND 120-140 billion.

Statistics of forecast reserves and resources and a list of projects on exploration for barite ores are

provided in Appendices 4 and 5.

### 3. Exploration for graphite ores

The identified and forecast reserves of graphite ores are around 29 million tons.

From now to 2015: To explore Bao Ha graphite mine and Yen Thai mine (Yen Bai) with C1+C2-level reserves projected at 20 million tons and 1.5 million tons, respectively.

The investment capital for graphite exploration is estimated at VND 28-30 billion.

Statistics of forecast reserves and resources and a list of projects on exploration for graphite ores are provided in Appendices 7 and 8.

### 4. Exploration for fluorite ores

The identified and forecast reserves of fluorite ores are around 17 million tons;

From now to 2015: To explore Xuan Lanh mine (Phu Yen) with reserves projected at 15-25 million tons. The investment capital for such exploration is estimated at VND 15-20 billion.

Statistics of forecast reserves and resources and a list of projects on exploration for fluorite ores are provided in Appendices 10 and 11.

### 5. Exploration for bentonite ores

The identified and forecast reserves of bentonite ores are around 95 million tons.

From now to 2015: To explore and upgrade Tam Bo mine (Lam Dong) with B+C1-level reserves projected at 4 million tons; Long Song River and Nha Me mines (Binh Thuan) with B+C1-level reserves projected at 5 million tons; and Co Dinh mine (Thanh Hoa) with B+C1-level

reserves projected at 70 million tons.

The investment capital for bentonite exploration is estimated at VND 55-65 billion.

Statistics of forecast reserves and resources and a list of projects on exploration for bentonite ores are provided in Appendices 13 and 14.

### 6. Exploration for diatomite ores

The identified and forecast reserves of diatomite ores are around 76 million tons;

From now to 2015: To explore and expand Hoa Loc mine (Phu Yen) with C1-level reserves projected at 5 million tons; Tuy Duong mine (Phu Yen) with C1-level reserves projected at 1 million tons; and Dai Lao mine (Lam Dong) with B+C1-level reserves projected at 8 million tons;

The investment capital for diatomite exploration is estimated at VND 85-105 billion.

Statistics of forecast reserves and resources and a list of projects on exploration for diatomite ores are provided in Appendices 16 and 17.

### 7. Exploration for talc ores

The identified and forecast reserves of talc ores are around 4.6 million tons.

From now to 2015: To explore for talc ores at Tan Minh mine (Phu Tho) with C1- and C2-level reserves projected at 0.5 million tons and 1 million tons, respectively; to explore My Thuan mine (Phu Tho) with C1- and C2-level reserves projected at 0.5 million tons and 1 million tons, respectively.

The investment capital for talc exploration is estimated at VND 30-40 billion.

Statistics of forecast reserves and resources and

a list of projects on exploration for talc ores are provided in Appendices 19 and 20.

## V. Mining and processing planning

### 1. Mining and processing of serpentine ores

Serpentine ores will be mined and processed into serpentine powder with the contents of  $MgO \geq 30\%$  and  $SiO_2 \leq 42\%$  for the production of NPK fertilizer and fused phosphorous fertilizer.

- From now to 2015: To mine Bai Ang serpentine mine and increase its mining capacity to 300,000-350,000 tons/year and upgrade the crushing station to reach the capacity of 80,000-100,000 tons/year. To invest in the mining and processing at Thuong Ha mine to reach the capacity of 200,000-250,000 tons/year.

- From 2016 to 2025: To maintain the mining output at Bai Ang and Thuong Ha mines. Investment will be made in the mining and processing at new serpentine mines in Lao Cai and Phu Tho regions when there is market demand.

- The total investment capital for the mining and processing of serpentine ores in the up-to-2015 planning period is estimated at VND 110 135 billion.

The list of investment projects on mining and processing of serpentine ores on an industrial scale is provided in Appendix 3.

### 2. Mining and processing of barite ores

- Barite ore products will be produced and processed for oil and gas and chemical industries.

+ Ground barite powder shall be used as an

oil and gas drilling mud, cement production and export, with a  $BaSO_4$  content of 75-85%.

+ High-quality barite in substitution of currently imported products (with a  $BaSO_4$  content  $\geq 95\%$  and a gravity of  $4.3 \text{ g/cm}^3$ ) for chemistry, glass and paint industries.

- From now to 2015:

+ To invest in expanding Bac Giang barite production workshop, and extract Lang Cao barite mine (Nui An, Nui Ca, Nui Hin and Nui Chua) with an output of 10,000 tons/year;

+ To maintain existing mines and processing establishments; to build Tuyen Quang high-quality barite production workshop with a capacity of 1,500-2,000 tons/year using barite supplied from mines in Tuyen Quang province and its vicinities;

+ To build Cao Bang barite production workshop with a capacity of 50,000 tons/year using barite supplied from Che Pen, Nake and Ban Vai-Ban Ran mines;

+ To invest in upgrading and expanding Bao Tre mine (Thanh Hoa) and Son Thanh mine (Nghé An) each with a capacity of 1,500-2,500 tons/year;

+ To invest in building Dong Pao and Na Cua sorting workshops (Lai Chau) when the project on mining and processing of rare earth-barite-fluorite mine is put into operation with a capacity of refined barite ores of 41,500-42,000 tons/year.

- From 2016 to 2025:

+ To step up mining to bring the output to 300,000-350,000 tons/year;

+ To invest in building in Lai Chau a high-quality barite production workshop with a capacity of 5,000-10,000 tons/year.

- The total investment capital for projects on barite ore mining and barite processing workshops in the planning period is estimated at VND 190-220 billion.

The list of investment projects on mining and processing of barite ores on an industrial scale is provided in Appendix 6.

### 3. Mining and processing of graphite ores

The following two types of graphite products are projected to be produced for metallurgy production of fire-bricks, electrodes and pencils:

- Non-crystallized graphite powder with a carbon content of 80-85%;

- Crystallized high-quality graphite with a carbon content of 94-97% and a size of +80-100 mesh;

- From now to 2015:

+ Yen Bai region: To invest in upgrading Co Phuc sorting factory to reach a capacity of 5,000-10,000 tons/year. To prioritize investment in a chemical sorting chain with refined ore products of a carbon content  $C \geq 94\%$ . Ores will be exploited from graphite mines in Yen Bai province;

+ North Central Vietnam: To invest in the mining and sorting at Hung Nhung mine (Quang Ngai) with a capacity of 10,000-13,000 tons/year of refined ores with a carbon content  $C \geq 80\%$ ;

+ Lao Cai region: To extract Nam Thi graphite

mine and build a sorting factory with a capacity of 5,000-10,000/year. Such sorting factory shall be located in Lao Cai and turn out mostly refined ores of a carbon content  $C > 80\%$ .

- From 2016 to 2025:

To raise the mining capacity and the capacity of Co Phuc graphite sorting factory (Yen Bai) to 15,000-20,000 tons/year of refined ores with a carbon content  $C \geq 90\%$  for domestic use. To maintain production in other regions and increase capacity if sale markets are available;

- The total investment capital for projects on graphite ore mining and graphite processing workshops in the planning period is estimated at VND 150-180 billion.

The list of investment projects on mining and processing of graphite ores on an industrial scale is provided in Appendix 9.

### 4. Mining and processing of fluorite ores

Projected product categories:

- Low-quality fluorite products of a  $\text{CaF}_2$  content = 80-85% for the cement and metallurgy industries;

- High-quality fluorite products of a  $\text{CaF}_2$  content = 90-98% for the chemical, glass and electroplating industries.

- From now to 2015:

+ Phu Yen region: To invest in building Phu Yen fluorite sorting workshop with a capacity of 5,000-6,000 tons/year and products of a  $\text{CaF}_2$  content = 80-85%. Fluorite ores will be extracted at Xuan Lanh mine.

+ Thai Nguyen region: To enter into a joint

venture to invest in mining and processing fluorite at Nui Phao mine with a capacity of 196,000 tons/year;

+ Lai Chau region: Fluorite is an accompanied product from extracting Dong Pao rare earth mine (F3 ore body); to process fluorite products with a capacity of 1,300 tons/year and mine and process fluorite at Na Cua mine (ore bodies 9 and 16) with a capacity of around 1,500 tons/year and products of a  $\text{CaF}_2$  content = 90-98%.

- From 2016 to 2025: To maintain the above fluorite production establishments and increase their output to meet market demands.

- The total investment capital for projects on fluorite ore mining and fluorite processing workshops in the up-to-2015 planning period is estimated at VND 35-40 billion (excluding that for investment in Nui Pao mine and Na Cua rare earth-barite-fluorite mine and Dong Pao mine).

The list of investment projects on mining and processing of fluorite ores on an industrial scale is provided in Appendix 12.

#### 5. Mining and processing of bentonite ores

Bentonite shall be produced according to standard API SPEC 13A and standard TC 01:2001/DMC.

- From now to 2015:

+ Thanh Hoa province: To maintain the mining and processing at Co Dinh mine with a capacity of 20,000 tons/year;

+ Lam Dong province: To invest in a processing factory in Di Linh district with a capacity of 25,000-30,000 tons/year using materials from Tam Bo mine;

+ Binh Thuan province: In Tuy Phong district, to invest in a processing factory with a capacity of 30,000-35,000 tons/year using materials from Nha Me mine. Depending on market demands, to invest in a second bentonite processing establishment with a capacity of 15,000-20,000 tons/year using materials from Long Song River mine:

- From 2016 to 2025:

+ Lam Dong region: To raise the capacity of Di Linh bentonite processing factory to 50,000-60,000 tons/year;

+ Binh Thuan region: Depending on market demands, to raise the capacity of the processing factory in Tuy Phong district to 60,000-70,000 tons/year and of Long Song River production establishment to 70,000-80,000 tons/year;

+ Thanh Hoa region: To raise the capacity of mining and processing bentonite at Co Dinh mine to 50,000-60,000 tons/year.

- The total investment capital for projects on bentonite ore mining and bentonite processing workshops in the planning period is estimated at VND 335-390 billion.

The list of investment projects on mining and processing of bentonite ores on an industrial scale is provided in Appendix 15.

#### 6. Mining and processing of diatomite ores

Processed diatomite products are projected to consist of ground diatomite powder used as an absorbent for environmental treatment in rearing brackish water shrimp, and as high-quality diatomite products (filter aid powder) for the liquor-beer-beverage and other industries;

- From now to 2015: To invest in mining and processing diatomite as an absorbent for environmental treatment in rearing brackish water shrimp and filter aid powder (of a  $\text{SiO}_2$  content  $\geq 85\%$ ) to meet domestic and export demands, including Tuy Duong and Hoa Loc mines (Phu Yen) and Dai Lao mine (Lam Dong). The capacity of processing the absorbent for environmental treatment is projected to reach 90,000-100,000 tons/year in Phu Yen and 70,000-80,000 tons/year in Lam Dong. The capacity of processing filter aid powder is projected to reach 30,000-45,000 tons/year in Phu Yen;

- From 2016 to 2025: Depending on market demands, to invest in expanding to raise the capacity of processing diatomite as an absorbent for environmental treatment in rearing brackish water shrimps to 200,000-280,000 tons/year; to increase the capacity of processing filter aid powder to around 250,000 tons/year to meet domestic and export demands;

- The total investment capital for projects on diatomite ore exploitation and diatomite processing workshops in the planning period is estimated at VND 545-605 billion.

The list of investment projects on mining and processing of diatomite ores on an industrial scale is provided in Appendix 18 to this Decision.

#### 7. Mining and processing of talc ores

Talc powder products with a MgO content  $\geq 24\%$  and  $\text{SiO}_2$  content  $\geq 60\%$  will be used for pharmaceutical, rubber and porcelain-china industries.

- From now to 2015:

+ Phu Tho region: To expand the talc powder-grinding workshop to reach a capacity of 10,000 tons/year of ground powder. Ores shall be extracted at Thu Ngac and Ngoc Lap mines. To build a workshop to process and produce super fine talc powder with a capacity of 20,000 tons/year; and extract ores at Tan Minh and My Thuan mines;

+ Son La region: To build in Ta Phu area a talc powder-grinding workshop with a capacity of 10,000-20,000 tons/year using materials from Ta Phu-Chanh Ke mine; depending on market potential, to increase its capacity to 40,000 tons/year.

- From 2016 to 2025:

Phu Tho region: Depending on market demands, to expand Thu Ngac ground powder workshop to reach the capacity of 50,000 tons/year; to expand the existing workshop or build at Tan Minh and My Thuan mines an additional workshop to produce super-fine talc ores of up to 50,000 tons/year.

- The total investment capital for projects on talc ore mining and talc ore processing workshops in the planning period is estimated at VND 740-830 billion.

The list of investment projects on mining and processing of talc ores on an industrial scale is provided in Appendix 21 to this Decision.

#### VI. Investment capital

The investment capital for exploration, mining and processing of serpentine, barite, graphite, fluorite, diatomite and talc ores in the planning

periods is estimated at VND 2,498-2,885 billion, including VND 1,083 1,295 billion for the up to-2015 period and VND 1,415-1,590 billion for the 2016-2025 period.

Investment capital sources include self-acquired capital of enterprises, the State's development investment loans, commercial loans and foreign direct investment capital.

## VII. Major solutions and policies

### 1. Group of overall solutions and policies

- Processing industrial minerals (serpentine, barite, graphite, fluorite, bentonite, diatomite and talc) in order to turn out high-quality products and preparations to meet the domestic demand and partially export deeply processed products:

- Further decentralizing responsibilities to manage natural resources, improving regulations and intensifying bidding for mineral activities; establishing joint-stock companies with the participation of experienced and financially and professionally capable organizations and individuals to invest in the exploration, mining and deep processing of minerals. Encouraging the diversification of forms of ownership to attract domestic and foreign resources for developing the mining and processing of serpentine, barite, graphite, fluorite, bentonite, diatomite and talc ores, giving priority to capable domestic enterprises; entering into joint ventures with foreign parties in processing activities with high technical and technological requirements such as diatomite, graphite and talc processing;

- Raising social responsibilities of enterprises

mining serpentine, barite, graphite, fluorite, bentonite, diatomite and talc minerals, such as making contributions to infrastructure construction; attracting, training and employing local laborers; proactively taking measures to protect the eco-environment and improve the social environment.

### 2. Group of specific solutions and policies

a/ Market solutions: To build and develop a state-managed domestic market for serpentine, barite, graphite, fluorite, bentonite, diatomite and talc products in line with Vietnam's integration roadmaps; to closely cooperate in supplying materials to processing establishments already and being set up under planning; to gradually dominate the domestic sale market and step by step penetrate into the international market.

b/ Research, transfer and receipt of sciences and technologies:

- To attach importance to researching and applying advanced mining technologies. To improve and upgrade existing technological chains of ore mining and processing. To research and build a technological process for mining and processing high-quality products with the joint participation of the State, science and technology enterprises and mineral mining and processing enterprises of different economic sectors;

- To cooperate with foreign parties in researching and producing graphite of a carbon content  $C \geq 95\%$ ; and high-quality barite, diatomite filter aid powder and talc.

c/ Human resource development and training:

To cooperate with training institutions (job-training schools, professional secondary schools, colleges, universities) in providing training, retraining and on-spot training of workforce and scientific researchers for the stages of mining, mineral sorting and metallurgy in accordance with Vietnam's conditions for exploiting serpentine, barite, graphite, fluorite, bentonite, diatomite and talc minerals. To attach importance to training qualified managers and business administrators engaged in mineral industries to meet enterprise development requirements in a competitive and integration environment.

d/ Environmental protection: Mining enterprises shall take adequate measures to proactively protect the environment in mineral exploration, mining and processing through applying modern and environmentally friendly technologies (observing regulations on solid wastes, wastewater, emissions; recovery of recycled water); to close mines and restore post-mining grounds and the environment; to ensure industrial sanitation and labor safety in production. The research and application of advanced environmental treatment technologies in all stages of production are encouraged. State management agencies shall furnish themselves with more equipment for the inspection and supervision of enterprises' environmental treatment systems.

e/ Investment capital solutions: In order to attract around VND 2 trillion for investment in developing the mining and processing of serpentine, barite, graphite, fluorite, bentonite, diatomite and talc ores up to 2025, capital is expected to be raised from the following sources:

- Self-acquired capital of enterprises;
- Budget supports, which shall be allocated for investment in outside-fence technical infrastructure works for large mining, sorting and refining zones; investment in training and scientific and technological research activities of institutes and schools in the mining industry;
- The State's investment credit loans, which shall be provided for investment projects on ore mining and processing in socio-economic difficulty- or exceptional difficulty-hit areas under current regulations;
- Domestic and foreign commercial loans;
- Foreign investment capital: joint ventures with foreign parties in projects on large-scale exploration, mining and processing of barite, diatomite, bentonite, graphite and talc ores.

f/ State management:

- To regularly review, update and adjust development plannings on exploration, mining and processing of serpentine, barite, graphite, fluorite, bentonite, diatomite and talc ores to suit the national and international socio-economic development situation;
- To formulate and improve mechanisms to manage in a centralized manner mineral exploration, mining and processing in order to ensure uniformity, closeness and non-overlap and raise flexibility and efficiency of the management, protection and mining of serpentine, barite, graphite, fluorite, bentonite, diatomite and talc ore resources;
- To rectify the management of natural resources and make statistics of and report

periodically on serpentine, barite, graphite, fluorite, bentonite, diatomite and talc mining activities from the grassroots to provincial and ministerial levels. To take strict measures and sanctions to handle organizations or individuals that fail to fully observe the laws on minerals and environment. To enhance inspection and examination of mining activities in order to prevent the illegal mining and export of minerals;

- To revise criteria for measuring serpentine, barite, graphite, fluorite, bentonite, diatomite and talc ore reserves and resources in response to the increasing prices of ores and products processed from serpentine, barite, graphite, fluorite, bentonite, diatomite and talc ores, and in response to the advancement of existing mining and processing sciences and technologies.

#### **VIII. Organization of implementation**

1. The Ministry of Industry and Trade shall publicize, and direct the implementation of, this Planning, regularly update and adjust the Planning and propose mechanisms and policies for sustainable development of the mining and processing of serpentine, barite, graphite, fluorite, bentonite, diatomite and talc ores, ensuring synchrony and suitability with the socio-economic development situation and international integration commitments.

2. The Ministries of Natural Resources and Environment; Science and Technology; Planning and Investment; Finance; Transport; Agriculture and Rural Development; and Information and Communication shall, within the ambit of their

functions and tasks, assume the prime responsibility for, and coordinate with the Ministry of Industry and Trade in, specifying solutions and policies mentioned in this Decision.

3. Provincial-level People's Committees shall:

- Organize the management and protection of serpentine, barite, graphite, fluorite, bentonite, diatomite and talc ore resources in their localities; and prevent the illegal mining and export of minerals;

- Organize according to their competence the elaboration of local plannings on exploration, mining and processing of serpentine, barite, graphite, fluorite, bentonite, diatomite and talc ores in line with this Planning and submit them to People's Councils of the same level for approval; zone off and approve areas where mineral-related activities are banned, temporarily banned or restricted;

- Coordinate with state management agencies and create conditions for enterprises to implement projects mentioned in this Decision.

*Article 2.-* This Decision takes effect 15 days after its publication in "CONG BAO."

*Article 3.-* Ministers, heads of ministerial-level agencies, heads of government-attached agencies and presidents of provincial-level People's Committees shall implement this Decision.

*Minister of Industry and Trade*  
**VU HUY HOANG**

## Appendices

LISTS OF SCHEMES ON EXPLORATION, MINING AND PROCESSING OF  
SERPENTINE, BARITE, FLUORITE, BENTONITE, DIATOMITE AND TALC ORES UP  
TO 2015, WITH A VISION TOWARD 2025 TAKEN INTO CONSIDERATION*(To the Industry and Trade Ministry's Decision No. 41/2008/QĐ-BCT  
of November 17, 2008)*

## Appendix 1

## FORECAST RESERVES AND RESOURCES OF SERPENTINE ORES

*(According to geological archives)*

| No.                    | Name of ore mine or spot | Level of research | Forecast reserves and resources (thousand tons) |       |                |                | Total  |
|------------------------|--------------------------|-------------------|---|-------|----------------|----------------|--------|
|                        |                          |                   | A   | B     | C <sub>1</sub> | C <sub>2</sub> |        |
| 1                      | Bai Ang (Thanh Hoa)      | Exploration       | 3,233   | 1,596 | 2,588          | 7,717          | 15,134 |
| 2                      | Te Thang (Thanh Hoa)     | Assessment        |   |       | 2,428          | 6,663          | 9,091  |
| 3                      | Thuong Ha (Lao Cai)      | Exploration       | 980   | 2,086 | 13,336         | 4,739          | 21,141 |
| 4                      | Tat Thang (Phu Tho)      | Exploration       |   | 219   | 580            |                | 799    |
| Total                  |                          |                   | 4,213   | 3,901 | 18,932         | 19,119         | 46,165 |
| A + B + C <sub>1</sub> |                          |                   | 27,046  |       |                |                |        |

## Appendix 2

## LIST OF INVESTMENT PROJECTS ON SERPENTINE ORE EXPLORATION

*(From now to 2015)*

| No. | Name of project  | Investment capital (VND billion) | Expected reserves  | Implementation duration |
|-----|--|----------------------------------|--|-------------------------|
| 1   | Additional exploration at Thanh Hoa serpentine mine (Nui Nua super Mafic block after investigation and assessment) | 15-20                            | 20 million tons of C <sub>1</sub> level and 5 million tons of A and B levels             | 2016-2020               |
| 2   | Exploration at Te Thang serpentine mine (Thanh Hoa)  | 5-10                             | 6 million tons of C <sub>1</sub> level and 3 million tons of B and C <sub>1</sub> levels | 2008-2015               |
| 3   | Additional exploration at Thuong Ha serpentine mine (Lao Cai)  | 15-20                            | 15 million tons of C <sub>1</sub> level and 6 million tons of A and B levels             | 2008-2015               |

**Appendix 3**

**LIST OF INVESTMENT PROJECTS ON INDUSTRIAL MINING AND PROCESSING OF SERPENTINE ORES**

| No. | Project  | Source of ore supply | Capacity (thousand tons/year) | Investment capital (VND billion) | Implementation duration |
|-----|--|----------------------|-------------------------------|----------------------------------|-------------------------|
| 1   | Mining and processing at Bai Ang serpentine mine (Thanh Hoa) | Bai Ang mine         | 300-350                       | Expanded investment (40-50)      | 2008-2015               |
| 2   | Serpentine grinding workshop (Thanh Hoa)                     | Bai Ang mine         | 80-100                        | New investment (40-50)           | 2008-2015               |
| 3   | Mining and processing at Thuong Ha serpentine mine (Lao Cai) | Thuong Ha mine       | 200-250                       | New investment (30-35)           | 2008-2015               |

**Appendix 4**

**FORECAST RESERVES AND RESOURCES OF BARITE ORES**

*(According to geological archives)*

| No. | Name of ore mine or spot | Level of research | Forecast reserves and resources (thousand tons) |                |                |                | Total  |
|-----|--------------------------|-------------------|---|----------------|----------------|----------------|--------|
|     |                          |                   | A   | C <sub>1</sub> | C <sub>2</sub> | P <sub>1</sub> |        |
|     | Lai Chau region          |                   |   | 43             | 4,062          | 16,820         | 21,626 |
| 1   | Dong Pao                 | Assessment        |   | 608            | 2,278          | 15,220         | 18,106 |
| 2   | Na Cua                   | Assessment        |   | 135            | 1,784          |                | 1,920  |
| 3   | Bac Nam Xe               | Assessment        |   |                |                | 1,600          | 1,600  |
|     | Cao Bang region          |                   |   |                | 389            | 630            | 1,019  |
| 4   | Che Pen                  | Assessment        |   |                | 129            | 34             | 163    |

|    |                                       |             |    |       |       |        |        |
|----|---------------------------------------|-------------|----|-------|-------|--------|--------|
| 5  | Na Ke                                 | Assessment  |    |       | 260   |        | 260    |
| 6  | Ban Vai-Ban Ran                       | Assessment  |    |       |       | 596    | 596    |
|    | Lang Son region                       |             |    |       | 25    | 49     | 74     |
| 7  | Ban Hau, Na Chanh, Tung Pha           | Assessment  |    |       | 25    | 49     | 74     |
|    | Bac Giang region                      |             | 90 | 233   | 135   |        | 458    |
| 8  | Lang Cao (Nui Am, Nui Ca, Nui Hin)    | Exploration | 90 | 233   | 135   |        | 458    |
|    | Tuyen Quang region                    |             |    | 257   | 1,186 | 379    | 1,822  |
| 9  | Xom Huc, NuoC Luan, Khuon Ben)        | Assessment  |    |       | 90    | 128    | 218    |
| 10 | Nang Khao-Ha Vi                       | Assessment  |    |       | 456   | 251    | 708    |
| 11 | Ngai Thang, Dong Ben, Huc, Viet Thang | Assessment  |    | 12    | 231   |        | 243    |
| 12 | Ao Sen                                | Exploration |    | 223   | 402   |        | 625    |
| 13 | Thuong Am (Dong Ben)                  |             |    | 22    | 7     |        | 29     |
|    | North Central Vietnam region          |             |    | 192   | 370   |        | 562    |
| 14 | Bao Tre                               | Assessment  |    | 126   | 179   |        | 305    |
| 15 | Son Thanh                             | Designing   |    | 66    | 191   |        | 257    |
|    | Total                                 |             | 90 | 1,425 | 6,168 | 17,878 | 25,561 |

**Appendix 5**

**LIST OF INVESTMENT PROJECTS ON BARITE ORE EXPLORATION**

*(From now to 2015)*

| No. | Name of project   | Investment capital (VND billion) | Expected reserves                               |
|-----|---|----------------------------------|---|
| 1   | Exploration at Che Pen, Na Ke, Ban Vai and Ban Ran mines (Cao Bang) | 15-20                            | 0.8 million tons of B and C <sub>1</sub> levels |
| 2   | Na Cua barite mine (Lai Chau)                                       | 50                               | 1.5 million tons of B and C <sub>1</sub> levels |
| 3   | Exploration for barite ores in Nang Khao-Ha Vi region (Tuyen Quang) | 15-20                            | 0.5 million tons of B and C <sub>1</sub> levels |
| 4   | Xom Hoac, Nuoc Luan, Khuon Ben (Tuyen Quang)                        | 15-20                            | 0.2 million tons of B and C <sub>1</sub> levels |
| 5   | Ngai Thang, Dong Ben, Huc, Viet Thang (Tuyen Quang)                 | 15-20                            | 0.2 million tons of B and C <sub>1</sub> levels |
| 6   | Ngoc Quan, Doan Hung district (Phu Tho)                             | 10                               | B and C <sub>1</sub> levels                     |

**Appendix 6**

**LIST OF INVESTMENT PROJECTS ON INDUSTRIAL MINING AND PROCESSING OF BARITE ORES**

| No.              | Project   | Source of barite ore supply  | Capacity (thousand ton/year) | Investment capital (VND billion) |
|------------------|---|--|------------------------------|----------------------------------|
| From now to 2015 |   |  |                              |                                  |
| 1                | Barite production workshop (Bac Giang)                | Lang Cao mine (Nui Chua, Nui Am, Nui Ca, Nui Hin)  | 10                           | Expanded investment (10-15)      |
| 2                | High-quality barite production workshop (Tuyen Quang) | Xom Hoac, Nuoc Luan, Nang Khao-Ha Vi, Ngai Thang, Dong Ben, Ao Sen, Thuong Am, Khuon Ben | 1.5-2.5                      | New investment (25)              |
| 3                | Barite production workshop (Cao Bang)                 | Che Pen, Na Ke, Ban Vai-Ban Ran  | 50                           | New investment (35)              |

|                   |  |                                      |       |                            |
|-------------------|--|--------------------------------------|-------|----------------------------|
| 4                 | Bao Tre barite production workshop (Thanh Hoa)     | Bao Tre mine                         | 1.5-2 | 10-15                      |
| 5                 | Son Thanh barite production workshop (Nghe An)     | Son Thanh mine                       | 1.5-2 | 10-15                      |
| 6                 | Dong Pao sorting workshop (Lai Chau)               | F3 ore body at Dong Pao mine         | 40    | Under a rare earth project |
| 7                 | Na Cua sorting workshop (Lai Chau)                 | Ore bodies 9 and 16 at Dong Pao mine | 1.5-2 | Under a rare earth project |
| From 2016 to 2025 |  |                                      |       |                            |
| 1                 | High-quality barite production workshop (Lai Chau) | Dong Pao and Tra Rua mines           | 5-10  | New investment (90-100)    |

## Appendix 7

## FORECAST RESERVES AND RESOURCES OF GRAPHITE ORES

(According to geological archives)

| No.                                | Name of ore mine or spot | Level of research | Forecast reserves and resources (thousand tons) |       |                |                |                | Total  |
|------------------------------------|--------------------------|-------------------|---|-------|----------------|----------------|----------------|--------|
|                                    |                          |                   | A   | B     | C <sub>1</sub> | C <sub>2</sub> | P <sub>1</sub> |        |
| I                                  | Northwestern region      |                   | 1,037   | 1,041 | 1,707          | 12,690         | 9,694          | 26,169 |
| 1                                  | Nam Thi (Lao Cai)        | Exploration       | 1,037   | 1,041 | 1,707          | 5,975          |                | 9,760  |
| 2                                  | Bao Ha (Yen Bai)         | Assessment        |   |       |                | 5,525          | 9,694          | 14,949 |
| 3                                  | Mau A (Yen Bai)          | Assessment        |   |       |                | 136            |                | 136    |
| 4                                  | Yen Thai (Yen Bai)       | Assessment        |   |       |                | 1,324          |                | 1,324  |
| II                                 | Central Vietnam region   |                   |   |       | 356            | 1,856          |                | 3,330  |
| 1                                  | Hung Nhuong (Quang Ngai) | Exploration       |   |       | 356            | 1,856          |                | 2,212  |
| 2                                  | Tien An                  |                   |   |       |                |                |                | 918    |
| Total                              |                          |                   | 1,037   | 1,041 | 2,063          | 14,546         | 9,694          | 29,299 |
| A+B+C <sub>1</sub>                 |                          |                   | 4,141   |       |                |                |                |        |
| A+B+C <sub>1</sub> +C <sub>2</sub> |                          |                   | 14,169  |       |                |                |                |        |

**Appendix 8**

**LIST OF INVESTMENT PROJECTS ON GRAPHITE ORE EXPLORATION**

(From now to 2015)

| No. | Name of project  | Investment capital (VND billion) | Expected reserves  |
|-----|--|----------------------------------|--|
| 1   | Exploration for graphite ores at Bao Ha mine (Yen Bai)   | 14-15                            | 15 million tons of C <sub>2</sub> -level ores and 5 million tons of C <sub>1</sub> -level ores |
| 2   | Exploration for graphite ores at Yen Thai mine (Yen Bai) | 14-15                            | 1 million tons of C <sub>2</sub> level ores and 0.5 million tons of C <sub>1</sub> -level ores |

**Appendix 9**

**LIST OF INVESTMENT PROJECTS ON INDUSTRIAL MINING AND PROCESSING OF GRAPHITE ORES**

| No.                      | Project   | Source of graphite ore supply  | Capacity (thousand tons/year) | Investment capital (VND billion)                                      |
|--------------------------|---|--|-------------------------------|---|
| <i>From now to 2015</i>  |   |  |                               |   |
| 1                        | Co Phuc graphite sorting factory (Yen Bai)        | Mau A, Yen Thai and Bao Ha mines and graphite mines of Yen Bai province                  | 5-10                          | Expanded investment (25-30)   |
| 2                        | Hung Nhuong graphite sorting factory (Quang Ngai) | Hung Nhuong graphite mine  | 10-13                         | Joint venture for new investment (50-60)                              |
| 3                        | Sorting factory (Lao Cai)                         | Nam Thi graphite mine  | 5-10                          | New investment when market is available (25-30)                       |
| <i>From 2016 to 2025</i> |   |  |                               |   |
| 1                        | Co Phuc graphite sorting factory (Yen Bai)        | Mau A, Yen Thai and Bao Ha mines and graphite mines of Yen Bai province                  | 15-20                         | Expanded investment or construction of a new sorting workshop (50-60) |
| 2                        |   | Maintaining the operation of Hung Nhuong and Nam Thi mines if sale markets are available |                               |   |

## Appendix 10

## FORECAST RESERVES AND RESOURCES OF FLUORITE ORES

*(According to geological archives)*

| No. | Name of ore mine or spot | Level of research | Forecast reserves and resources<br>(thousand tons) |                |                |                | Total      |
|-----|--------------------------|-------------------|--|----------------|----------------|----------------|------------|
|     |                          |                   | B  | C <sub>1</sub> | C <sub>2</sub> | P <sub>1</sub> |            |
|     | Lai Chau region          |                   |  | 912.74         | 1,073.09       | 6,137.767      | 8,123.597  |
| 1   | Nà Cua                   | Assessment        |  | 287.9          | 596.13         |                | 884.03     |
| 1   | Dong Pao-Binh Lu         | Assessment        | 8.52   | 577.94         | 353.86         | 137.767        | 7,069.567  |
|     | Cao Bang region          |                   |  | 4.55           | 0.99           |                | 5.54       |
| 3   | Cao Son                  | Exploration       |  | 4.55           | 0.99           |                | 5.54       |
|     | Thai Nguyen region       |                   |  |                |                |                | 8,508      |
| 4   | Núi Phao mine            |                   |  |                |                |                | 8,508      |
|     | Phu Yen region           |                   |  | 46.9           | 123.11         | 107            | 277        |
| 5   | Xuan Lanh                | Assessment        |  | 46.9           | 123.11         | 107            | 277        |
|     | Total                    |                   | 8.52   | 964.18         | 1,197.19       | 6,137.98       | 16,914.137 |

## Appendix 11

## LIST OF INVESTMENT PROJECTS ON FLUORITE ORE EXPLORATION

*(From now to 2015)*

| No. | Name of project                             | Investment capital (VND billion) | Expected reserves (million tons) |
|-----|---|----------------------------------|----------------------------------|
| 1   | Ore exploration at Xuan Lanh mine (Phu Yen) | 15-20                            | 15-25                            |

**Appendix 12**

**LIST OF INVESTMENT PROJECTS ON INDUSTRIAL MINING AND PROCESSING OF FLUORITE ORES**

| No.               | Project  | Source of fluorite ore supply                       | Capacity (thousand ton/year) | Investment capital (VND billion) |
|-------------------|--|---|------------------------------|----------------------------------|
| From now to 2015  |  |   |                              |                                  |
| 1                 | Fluorite mining and processing (Phu Yen)                 | Xuan Lanh mine                                      | 5-6                          | Expanded investment (35-40)      |
| 2                 | Fluorite mining and processing at Dong Pao mine          | F3 ore body at Dong Pao mine                        | 1.3                          | Joint venture for new investment |
| 3                 | Fluorite mining and processing at Na Cua mine (Lai Chau) | Ore bodies 9 and 16 at Na Cua mine                  | 1.5                          | Expanded investment              |
| 4                 | Fluorite mining and processing (Thai Nguyen)             | Nui Phao mine                                       | 196                          | Joint venture for new investment |
| From 2016 to 2025 |  |   |                              |                                  |
| 1                 |  | Maintaining the stable operation of the above mines |                              |                                  |

**Appendix 13**

**FORECAST RESERVES AND RESOURCES OF BENTONITE ORES**

*(According to geological archives)*

| No. | Name of ore mine or spot                           | Level of research       | Forecast reserves and resources (thousand tons) |                |                | Total  |
|-----|--|-------------------------|---|----------------|----------------|--------|
|     |  |                         | C <sub>1</sub>                                  | C <sub>2</sub> | P <sub>1</sub> |        |
|     | South Central Vietnam-Central Highlands ore region |                         | 5,418   | 6,815          | 24,167         | 36,670 |
| 1   | Tam Bo (Lam Dong)                                  | Preliminary exploration | 389   | 153            | 3,699          | 4,241  |

|   |                              |                         |       |        |        |        |
|---|------------------------------|-------------------------|-------|--------|--------|--------|
| 2 | Gia Quy (Ba Ria-Vung Tau)    | Preliminary exploration | 3,990 | 6,293  |        | 10,229 |
| 3 | Nha Me (Binh Thuan)          | Survey                  | 1,039 | 423    | 2,996  | 4,458  |
| 4 | Song Long River (Binh Thuan) | Survey                  |       |        | 17,472 | 17,472 |
|   | Thanh Hoa region             |                         |       | 76,144 |        | 76,144 |
| 5 | Co Dinh dumping site         |                         |       | 924    |        | 924    |
| 6 | Trieu Son dumping site       |                         |       | 40,060 |        | 40,060 |
| 7 | Mau Lam dumping site         |                         |       | 35,160 |        | 35,160 |
|   | Total                        |                         | 5,418 | 82,959 | 3,699  | 95,072 |

#### Appendix 14

#### LIST OF INVESTMENT PROJECTS ON BENTONITE ORE EXPLORATION

(From now to 2015)

| No. | Name of project  | Investment project (VND billion) | Projected reserves                             |
|-----|--|----------------------------------|--|
| 1   | Exploration at and upgrading of Tam Bo mine (Lam Dong)       | 15-20                            | 4 million tons of B and C <sub>1</sub> levels  |
| 2   | Exploration at Song Long River and Nha Me mines (Binh Thuan) | 20-25                            | 5 million tons of B and C <sub>1</sub> levels  |
| 3   | Exploration at Co Dinh mine (Thanh Hoa)                      | 20-25                            | 70 million tons of B and C <sub>1</sub> levels |

#### Appendix 15

#### LIST OF INVESTMENT PROJECTS ON INDUSTRIAL MINING AND PROCESSING OF BENTONITE ORES

| No.              | Project                                | Source of bentonite ore supply | Capacity (thousand ton/year) | Investment capital (VND billion) |
|------------------|--|--------------------------------|------------------------------|----------------------------------|
| From now to 2015 |  |                                |                              |                                  |
| 1                | Di Linh processing workshop (Lam Dong) | Tam Bo mine                    | 25-30                        | Expanded investment (25-30)      |

|                   |  |                              |       |                              |
|-------------------|--|------------------------------|-------|------------------------------|
| 2                 | Nha Me processing workshop (Binh Thuan)          | Nha Me mine                  | 30-35 | New investment (30-35)       |
| 3                 | DMC processing workshop (Yen Vien)               | Co Dinh mine and procurement | 20-30 | Expanded investment (25-30)  |
| 4                 | Song Long River processing workshop (Binh Thuan) | Song Long River mine         | 15 20 | New investment (20-25)       |
| From 2016 to 2025 |  |                              |       |                              |
| 1                 | Di Linh processing workshop (Lam Dong)           | Tam Bo mine                  | 50-60 | Expanded investment (40-50)  |
| 2                 | Nha Me processing workshop (Binh Thuan)          | Nha Me mine                  | 60-70 | Expanded investment (80-90)  |
| 3                 | DMC processing workshop (Yen Vien)               | Co Dinh mine and procurement | 50-60 | Expanded investment (25-30)  |
| 4                 | Song Long River processing workshop              | Song Long River mine         | 70-80 | Expanded investment (90-100) |

**Appendix 16**

**FORECAST RESERVES AND RESOURCES OF DIATOMITE ORES**

(According to geological archives)

| No.                            | Name of ore mine or spot | Level of research     | Forecast reserves and resources (thousand tons) |                |                | Total  |
|--------------------------------|--------------------------|-----------------------|---|----------------|----------------|--------|
|                                |                          |                       | C <sub>1</sub>                                  | C <sub>2</sub> | P <sub>1</sub> |        |
|                                | Lam Dong province        |                       |   |                |                |        |
| 1                              | Dai Lao                  | Exploration           | 900   | 8,000          |                | 8,900  |
|                                | Kon Tum province         |                       |   |                |                |        |
| 2                              | Kon Tum                  | Designing-Assessment  |   |                | 25,600         | 25,600 |
|                                | Phu Yen province         |                       |   |                |                |        |
| 3                              | Hoa Loc                  | Designing-Exploration | 3,710   | 10,171         | 23,882         | 37,763 |
| 4                              | Tuy Duong                | Technical survey      |   | 3,450          |                | 3,450  |
| Total                          |                          |                       | 4,610   | 21,621         | 49,482         | 75,713 |
| C <sub>1</sub> +C <sub>2</sub> |                          |                       | 26,231  |                |                |        |

## Appendix 17

## LIST OF INVESTMENT PROJECTS ON DIATOMITE ORE EXPLORATION

(From now to 2015)

| No. | Name of project  | Investment project (VND billion) | Expected reserves                             |
|-----|--|----------------------------------|---|
| 1   | Exploration at and expansion of Hoa Loc mine (Phu Yen) | 15-20                            | 5 million tons of C <sub>1</sub> level        |
| 2   | Exploration at Tuy Duong mine (Phu Yen)                | 10-15                            | 1 million tons of C <sub>1</sub> level        |
| 3   | Exploration at Dai Lao diatomite mine (Thanh Hoa)      | 60-70                            | 8 million tons of B and C <sub>1</sub> levels |

## Appendix 18

## LIST OF INVESTMENT PROJECTS ON INDUSTRIAL MINING AND PROCESSING OF DIATOMITE

| No.                      | Project                                      | Source of ore supply        | Capacity (thousand ton/year) | Investment capital (VND billion) |
|--------------------------|--|-----------------------------|------------------------------|----------------------------------|
| <i>From now to 2015</i>  |  |                             |                              |                                  |
| 1                        | Diatomite mining and processing in Phu Yen   | Tuy Duong mine              | 90-100                       | Expanded investment (45-50)      |
| 2                        | Diatomite mining and processing in Lam Dong  | Dai Lao mine                | 70-80                        | Expanded investment (35-40)      |
| 3                        | High-quality diatomite processing in Phu Yen | Hoa Loc and Tuy Duong mines | 30-45                        | 30-35                            |
| <i>From 2016 to 2025</i> |  |                             |                              |                                  |
| 1                        | Diatomite mining and processing in Phu Yen   | Tuy Duong mine              | 110-160                      | Expanded investment (90-100)     |
| 2                        | Diatomite mining and processing in Lam Dong  | Dai Lao mine                | 90-12-                       | Expanded investment (115-130)    |
| 3                        | High-quality diatomite processing in Phu Yen | Hoa Loc and Tuy Duong mines | 240-250                      | Expanded investment (230-250)    |

**Appendix 19**

**FORECAST RESERVES AND RESOURCES OF TALC ORES**

(According to geological archives)

| No. | Name of ore mine or spot            | Level of research | Forecast reserves and resources (ton) |                |                |                | Total     |
|-----|-------------------------------------|-------------------|---------------------------------------|----------------|----------------|----------------|-----------|
|     |                                     |                   | B                                     | C <sub>1</sub> | C <sub>2</sub> | P <sub>1</sub> |           |
| 1   | Son La region                       | Exploration       | 17,697                                | 18,130         | 97,378         |                | 133,205   |
|     | Ta Phu-Chanh Ke                     |                   | 17,697                                | 18,130         | 97,378         |                | 133,205   |
|     | Phu Tho region                      |                   |                                       | 137,800        | 2,576,755      | 1,797.76       | 4,512,387 |
| 2   | Ngoc Lap                            | Exploration       |                                       |                | 4,200          |                | 4,200     |
| 3   | Tan Lap                             | Assessment        |                                       |                | 9,274          |                | 9,274     |
| 4   | Tan Minh                            | Assessment        |                                       |                | 1,359,515      |                | 1,359,515 |
| 5   | Thu Ngac                            | Assessment        |                                       |                | 661,967        | 1,797,579      | 2,459,546 |
| 6   | My Thuan                            | Assessment        |                                       | 137,800        | 540.2          |                | 678,000   |
|     | Hoa Binh region                     |                   |                                       |                |                |                |           |
| 7   | Lang Tru                            | Assessment        |                                       |                | 1,608          | 0.181          | 1,789     |
|     | Total                               |                   | 17,697                                | 155,930        | 2,674,142      | 1,797.76       | 4,645,529 |
|     | B + C <sub>1</sub>                  |                   |                                       | 173,627        |                |                |           |
|     | B + C <sub>1</sub> + C <sub>2</sub> |                   |                                       |                | 2,848          |                |           |

**Appendix 20**

**LIST OF INVESTMENT PROJECTS ON TALC ORE EXPLORATION**

(From now to 2015)

| No. | Name of project                                 | Investment project (VND billion) | Expected reserves   |
|-----|---|----------------------------------|---|
| 1   | Exploration for talc ores in Tan Minh (Phu Tho) | 15-20                            | 1 million tons of C <sub>2</sub> level and 0.5 million tons of C <sub>1</sub> level |
| 2   | Talc exploration in My Thuan (Phu Tho)          | 15-20                            | 1 million tons of C <sub>2</sub> level and 0.5 million tons of C <sub>1</sub> level |

## Appendix 21

LIST OF INVESTMENT PROJECTS ON INDUSTRIAL MINING AND  
PROCESSING OF TALC

| No.               | Project  | Source of ore supply                          | Capacity<br>(thousand<br>ton/year) | Investment<br>capital (VND<br>billion) |
|-------------------|--|---|------------------------------------|--|
| From now to 2015  |  |   |                                    |  |
| 1                 | Thu Ngac ground powder workshop, Phu Tho         | Thu Ngac and Ngoc Lap mines, Phu Tho province | 10                                 | New investment (35-40)                 |
| 2                 | Super fine powder workshop, Phu Tho              | Tan Minh and My Thuan mines                   | 20                                 | New investment (25-30)                 |
| 3                 | Ground powder workshop in Ta Phu region, Son La  | Ta Phu and Chanh Ke mines                     | 10-20                              | New investment (20-25)                 |
| 4                 | Ground powder workshop in Ta Phu region, Son La  | Ta Phu and Chanh Ke mines                     | 20-40                              | Expanded investment (90-100)           |
| From 2016 to 2025 |  |   |                                    |  |
| 1                 | Thu Ngac ground powder workshop, Phu Tho         | Thu Ngac and Ngoc Lap mines, Phu Tho province | 50                                 | Expanded investment (180-190)          |
| 2                 | Super fine talc powder workshop, Phu Tho         | Tan Minh and My Thuan mines                   | 50                                 | Expanded investment (50-60)            |
| 3                 | Ground powder workshop in Ta Phu region (Son La) | Ta Phu and Chanh Ke mines                     | 50                                 | Expanded investment (90-100)           |