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## Executive Finding of Mercury Investigation in Guizhou

### Global Village of Beijing

From July 12 to 16, 2006, two GVB members went to Tongren, Guizhou Province for an environmental investigation. The more specific targeted areas include Tongren City and Wanshan Special District. The focuses of this investigation were on mercury mining, smelting, trade and other current condition and historical effects related to mercury. This paper summarizes the key findings of the report based on this investigation and subsequently submitted to National People's Congress of China and State Environmental Protection Administration.

The report uses four parts to describe the observation by two GVB investigators, namely 1) historical problems resulted from mercury mining and production, 2) current mercury mining, 3) artisanal mercury smelting and 4) mercury demand, supply and trade. In the last part of the report, it makes some suggestions with regard to better policy and measures of mercury management in China. Most notably, it compares the necessity of both global binding instrument and national mandatory and voluntary policies.

## Key findings

### 1) Historical problems resulted from mercury mining

- Huge amount of tailings form no less than 10 hills spreading the mining areas, which cover natural habitats and agricultural land. Mercury in different forms will be washed away to downstream rivers and lakes, and further enter into soil and groundwater. It will take tens of years to clear up these tailings, depending on various factors such as financial fund and applicable technology. A most popular way to clear the tailing that investigators saw is to lease the tailing hill to brick manufacturers. The contract time is at least 10 years. One problem of this solution is that the brick made of scoria is too crispy and must be added into more other materials in order to be better used. Another central government funded project is to replant on the scoria-covering field. This seems to be successful, with one apparent risk that crops on this replanted field contain high level of heavy metal.
- Over 40 years of mining also leads to serious geological damage and geological disaster risk in the investigated area. Some small-scale disasters have already occurred. The local government has projects to move village away from highly risky area.



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- Air pollution, soil and water contamination are another apparent result of mercury mining. According to published scientific research, mercury content in the air, soil and water are all significantly higher than different background figure or national standard. Local people are also tested to have higher mercury burden in their body. Mercury in rice is higher than WHO recommended permitted intake level. Considering that rice is the main staple of local people, research on the health effect needs to be urgently enhanced, in order to avoid any mass public health problems.
- Investigators also visited a most seriously harmed old man living in the mine area. He has been diagnosed of being poisoned by mercury vapor for 40 years. He lost working ability 7 years after he started working in the mine laboratory. A most apparent symptom of poisoning is hand-dithering and head-dithering, which shows his central nervous system was damaged. Introduced by him, there are some other victims but less serious than him.
- Exhausted mineral resource also brought about deteriorating economy and livelihood. Compared with other parts of China, this area is still identified as in poverty. Besides, the bankrupt of the mine in 2002 also result in many social problems. Local government took over the burden of mine workers' pension and other responsibility of their social securities, but never helpful enough as before. Young people have gone out for jobs, leaving old people without good taking-care-of.

### 2) Current mercury mining activities

- Local villagers are continuing to look for mercury ore from exhausted mines and tailings, though mercury content in these ores is very low.
- Investigators visited an authorized small-scale mercury mine, with 2000 tones reserve. Many of these ores will be sold to artisanal mercury smelters located nearby.

### 3) Artisanal mercury smelting

- Investigators visited two centralized artisanal mercury smelting spots. One has larger scale, with near 200 stoves, while the other one has smaller scale, with only around 20 stoves. The two spots smelt different materials to produce mercury. The larger one is located near the aforementioned small-scale mercury mine and thus smelts mercury ores. The smaller one smelts waste mercury containing catalyst returned by PVC plants. The similarities of the two spots include: they are both run by local villagers; it is very hard to quantify their resources input and product output because both the ores and waste catalyst came in irregularly and the production rate varies significantly; they both use the same primitive smelting equipment,



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which are not well airproofed; workers, without any gears, are all not protected well.

- Villagers illegally buy waste mercury catalyst originating from PVC plants at higher prices, which significantly affect the business between PVC plants and legal mercury treatment companies.
- Although the health effect is unknown, one young people disclosed that some of his folk villagers who are involved in smelting have abnormal symptoms.

#### 4) Mercury demand, supply and trade

The information achieved for this session is largely based on the interview with the manager of a mercury treatment company in Wanshan.

- Rocketing mercury price reflect growing demand for mercury. The mercury market price with valid invoice changed from 2002 to 2006 is as following: 2002~2003: 60~70 thousand RMB/Ton; 2004: 200 thousand RMB/Ton; After 2004: 270~280 thousand RMB/Ton; First half of 2006: 240~250 thousand RMB/Ton. There exists illegal mercury market. Currently, without valid invoice, the mercury price per ton is at 190~200 thousand RMB/Ton.
- Mercury recycling is a major source for producing new mercury. New mercury catalyst contains around 11% mercury-chloride. This percentage in waste catalyst returned by PVC plants will reduce to around 3%.
- Required by governmental policy, mercury treatment company purchase waste catalyst from PVC plants. The price in legal market is between 2000 to 3000 RMB per ton. However, artisanal smelters buy them with higher price between 4000 to 5000 RMB per ton. As a result, formal mercury treatment company can only take back one fifth of what they supposed to do.
- Authorized by the government, the company that the investigators interviewed holds 30 tons of mercury import quota. However, this amount, plus those recycled from waste catalyst and domestic legal and illegal supply, is far not enough to satisfy their production and market demand. As estimated by the manager, there are 50 tons of smuggled mercury exchanged in Wanshan Special District each month and 35 tons of them are sold to formal mercury treatment companies.
- Smuggled mercury comes from Southeastern coaster cities, such as Zhanjiang, Wenzhou, and recently Shanghai.



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- The company can produce titanium-mercury amalgam as a substitute for pure mercury, which is used in fluorescent bulbs. This alternative cost less mercury. However, without policies encouraging or requiring manufacturers to shift to this new materials. There is no market for this substitute now.

### 5) Recommendations

- Reducing mercury demand is the prioritized mission for tackling mercury use, emission and its consequent impact on human and environment.
- Although due to some effective policies, the amount of mercury used in some sectors has been significantly reduced, some industries, especially PVC, fluorescent light and measurement equipment are using more mercury and as a result expand the mercury demand.
- To tackle mercury trade and demand, both international/national legally binding instrument and voluntary measures are needed, and need to be developed in the same time. Without applicable economic incentives, financial and technology assistance, legally binding instrument will not effectively work well but may incur some unintentional result, for example, stimulating more smuggling and illegal mining. By contrast, some on-going partnership projects, without international or national mandatory policies, may achieve success to some extent because of political reasons or enough resources input, but cannot be copied and expanded to broader areas.
- In order to alleviate the problems in Tongren area, and based on the fact that illegal mining and smelting are a complex phenomenon and cannot be extinguished overnight, the report suggest: the current mercury import quota should be reviewed and reformed; local government should seriously battle against illegal purchase of mercury catalyst and protect legal companies' interest; local government should take more measures to secure mine workers and smelters' occupational health and safety, and carry out more educational activities; local EPA should better monitor the environmental effects of new mercury mine and artisanal mercury smelting, and propose practical instruments to reduce the environmental impact of mercury related activities.