Environmental Monitoring Report

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January–March 2006

PRC: Zhanghewan Pumped Storage Power Station Project

Prepared by Hebei Zhanghewan Pumped Storage Co., Ltd. for the Hebei Electric Power Co. and the Asian Development Bank.

PEOPLE'S REPUBLIC OF CHINA

ZHANGHEWAN PUMPED STORAGE POWER STATION PROJECT

Contract N° 03IJBJGB/000144FR between
Hebei Zhanghewan Pumped Storage Co., Ltd.,
Cetic International Tendering Co., Ltd
and Electricité de France

ENVIRONMENTAL MONITORING REPORT FOR FIRST QUARTER OF 2006

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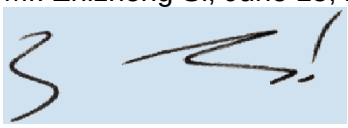
Mr. Zhizhong Si, June 15, 2006 	

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Zhizhong Si

1. INTRODUCTION

This report presents the findings of the independent environmental monitoring for the First quarter of 2006 (January 1 – March 31). The information for this report mainly comes from the environmental monitoring report provided by, and communication with, the domestic environmental monitoring and advisory agency (consortium of Hebei Science and Technology University and the Hebei Tiandichaoyang Environmental Science and Technology Co. Ltd.).

2. ENGINEERING PROGRESS

During the First quarter of 2006, the main activities at the upper reservoir were digging mortise on the structure of the joint surface of asphaltum concrete, making experiment on the slope flow on anti-filter layer, doing inside producing test experiment on even platform of the reservoir bottom, making the second industry experiment outside, matching the asphaltum concrete by bone materials and the installation and debugging of 2# asphaltum concrete building. Until now, most part of these activities were completed.

For the underground system and the sand blockage and discharge system, the construction of main and auxiliary workshop, inlet & outlet of the reservoir down side, watercourse system, the branch hole of communication and etc were all progressing steadily as planned.

During this quarter, the continue construction blockage river dam of down reservoir focused on the central hold part, the left part of non-flooding, the upper and lower passages, and fluctuant body of right side and the protection bank of the right side. Most part of the project have been completed from now.

3. ENVIRONMENTAL MANAGEMENT ACTIVITIES

A series of environmental management tasks were performed during this quarter by the Zhanghewan Pumped Storage Co. The major environmental management tasks included:

- In order to construct a high-level hydropower project characterized with “security, good quanlity, right-in-time, efficient and environmental protection”, the company set up the environment protection office particularly.
- According to the periodical environment pollution and ecological problems that were proposed in quarterly assessment report by environmental consulting institutions, the company instructed the relevant organizations to take corrective actions to environmental issues.
- Further improvement was made to the sewage treatment facilities at the Project Management Office.
- Making use of condition in dry season, the ground of the workers’ living area was rigidified and the ever-green trees were planted for the prevention of the soil and water erosion.
- With assistance from the domestic technical support agency, the Engineering Department of the ZPSC made regular inspections of the environmental facilities in the various sites and also issued the instructions on the steady operation of underground sewage treatments.

- Conducted public participation based on the characters of construction and its impact scope, and did regular inspections on the sewage, waste water, noise control measures and the treatment of winnowed sand.

4. ENVIRONMENTAL MONITORING

The environmental monitoring during this quarter covered air quality, water quality (ambient and effluent), noise and public health, as well as public participation.

4.1 Air Quality Monitoring

Air quality sampling was done between February 15 and 18 at three locations: ZPSC office building area, construction camp and settlements of Yanzhuangcun Village. Five parameters were monitored, including SO_2, TSP, NO_2, HC and CO.

The results of the air quality monitoring showed that the average daily concentrations of SO_2 at the three locations ranged between 0.046 ~ 0.083 mg/m^3, compared to the maximum allowable limit of 0.15 mg/m3 under the “National Atmospheric Quality Standards” (GB3095-1996). The average daily concentrations of NO_2 at the three locations ranged between 0.043 ~ 0.053 mg/m^3, compared to the applicable standard of 0.12 mg/m^3. The average daily concentrations of CO at the three locations ranged between 1.150 ~ 1.942 mg/m^3, compared to the applicable standard of 4.00 mg/m^3. The average daily concentrations of TSP ranged between 0.198 ~ 0.280 mg/m^3, compared to the applicable standard of 0.30 mg/m^3. The average hourly concentrations of HC at the three locations ranged between 0.012 ~ 0.053 mg/m^3; there is no Chinese standard on HC, but as a reference, these are below the US standard of 0.16 mg/m^3.

In summary, the average daily concentrations of SO2, NO2, CO and TSP all met the “National Atmospheric Quality Standards” (GB3095-1996). The impact of the construction activities was therefore within acceptable limits. But comparing to the last quarter, the concentrations of the SO2, NO2, CO, TSP and HC were raised in degrees.

4.2 Water Quality Monitoring

The monitoring of water quality at the intake, centre and outlet of the lower reservoir was conducted. Water samples were taken on January 17, February 12 and March 15. A total of 26 parameters, as mandated by Chinese law for surface water, were tested for each water sample.

The results of the water quality monitoring indicated that all of the tested parameters, except for TN, met the “National Environmental Quality Standards for Surface Water Quality” (GB3838-2002). TN violating applicable standards is a common phenomenon for reservoirs in northern China. For instance, the Gangnan and Huangbizhuang Reservoirs in Shijiazhuang both have extraordinarily high concentrations of TN.

In summary, the measured water quality parameters, except for TN, met the “National Environmental Quality Standards for Surface Water”. The extraordinarily high concentrations of TN is not attributable to the project, but was consistent with the regional baseline. Therefore, the project did not cause undue impact on the aquatic environment from construction activities during this quarter.

4.3 Noise Monitoring

Three locations were monitored for noise pollution from February 15 through 16. They included: ZPSC office building area, construction camp, and residential areas of Yanzhuangcun Village.

The results of the acoustic monitoring showed that the average 24-hour equivalent sound level (Leq) at the ZPSP Office was 47.5 dB(A), with the day-time average level, Ld = 51 dB(A) and the night-time average level, Ln = 40.5 dB(A). At the construction camp, the average 24-hour Leq was 50.8 dB(A), with the day-time average level, Ld = 51.5 dB(A) and the night-time average level, Ln = 51.5 dB(A). At the Yanzhuangcun Village, the average 24-hour Leq was 49.1 dB(A), with the day-time average, Ld = 49.1 dB(A) and the night-time average, Ln = 48.6 dB(A). The Leq measurements at the three locations were all below the legal limit of 55 dB(A).

In summary, the Leq measurements were all within the maximum allowable limits for respective areas, indicating no acoustic annoyance to construction workers, ZPSP staff or local communities.

4.4 Public Health

During this quarter, the public health program focused on three tasks. First, the drinking water for the construction camps, ZPSC office building area and the Yanzhuangcun Village was tested for 12 parameters which all met the regulatory standards. First, the construction workers in the construction camps of the upper and lower reservoirs, the ZPSC office building were screened for professional, infectious and epidemic diseases. None was found to carry such diseases. First, health examinations were carried out for 3 chefs and 105 workers. Those caterers were found to have proper health certificates and no transmittable diseases were discovered.

4.5 Wastewater Treatment Facilities

Samples were taken from the discharge outlets of the sewage treatment facilities for the construction camps of the upper and lower reservoir, and for the ZPSC office building area, and from the engineering wastewater treatment facility for the underground system, on January 17, February 12 and March 15. The tested parameters included: TSS, COD, BOD_5 and NH_3-N for all facilities.

The results of the testing showed that the effluent from the four sewage and engineering wastewater treatment facilities met the “Comprehensive Standards for Wastewater Discharges” (GB8978-1996). The sewage, after treatment, was used to irrigate green plants, without being discharged to the surface water (i.e., the Zhanghewan Reservoir). Meanwhile, with the effective operation of the wastewater treatment facilities and considering the small volume of sewage and engineering wastewater, the adverse effect of the treated effluent on the surface water bodies is minimal.

4.6 Ecological Restoration and Soil Erosion Control

The ZPSC took advantage of the good weather conditions during the First quarter to accelerate the activities for ecological restoration and soil erosion control, as follows:

(1) Continuing with landscaping at the Office building area, and for the side slopes;
(2) Adopting engineering measures to control water and soil erosion and landslide along the roadsides,

(3) Adopting engineering measures to further treat the spoil sites for ecological restoration and water and soil control.

5. PUBLIC PARTICIPATION

Surveys of 85 construction workers/managers and community members were conducted during the quarter, with the use of random sampling methods and ad hoc visits. In particular, the surveys included those covered in the surveys of the last quarter. The comments received are summarized as follows:

- According to the surveys, the respondents were satisfied with the environmental protection measures;
- In particular, the respondents continued to feel satisfied with the reduced impact because of strengthened dust suppression measures such as increased frequency of water spraying on construction roads. But the weather was dry with no much rain, the dust pollution was still heavy and the residents close to the explosion sites and the road proposed to continue take more effective measures to control the dust pollution.

6. CONCLUSION

The environmental monitoring was conducted during this quarter in accordance with the specifications of the approved environmental monitoring plan. The recommended mitigation measures for controlling air, water and acoustic pollution proved to be effective, such that the air, water and acoustic impact of the project was minimized to acceptable levels.

The public health program was also effective such that no outbreak of infectious diseases was reported at the construction camps, office building area and local communities. Moreover, it was discovered through the public participation program that the general public were satisfied with the strengthened dust suppression measures in some extent, but they wished to take more effective measures.

APPENDIX 1: PROJECT PHOTOS

Photo 1: Lower Dam under Construction

Photo 2: Intake/Outlet Control Gate Under Construction (Lower Dam)

Photo 3: Effluent Sampling

Photo 4: Air Quality Sampling

Photo 5: Water Quality Sampling

Photo 6: Water Quality Sampling

Photo 6: Inspection on Upper Reservoir Sewage Facilities

Photo 7: Dust on Construction Road

Photo 7: Noise Quality Sampling

Photo 8: Noise Quality Sampling

Photo 9: Sampling of Villagers' Drinking Water

Photo 10: Drinking Water Sampling at Dinning Hall of Upper Reservoir