The Analysis of Present Situation and Countermeasure about Water Pollution in Qinhuangdao

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Abstract. According to the successful experience of comprehensive control and theoretical research results on water environment at home and abroad, the paper has analyzed the most urgent water pollution problems in currently economic and social conditions, and put forward the corresponding control countermeasures. Through the evaluation and analysis of natural environment, social economic status quo, characteristics, present situation of water environment and pollution status of water resource in Qinhuangdao, the paper comprehensively considered all the relevance and operability between pollution control schemes and proposed the most important measures solving the mainly present problems in Qinhuangdao. Combining with domestic and foreign environmental protection strategies and policies, it also studied water pollution policy security solutions and management system which are suitable for Qinhuangdao, and pointed out that improvement of two non-engineering measures is the most basic guarantee of other schemes. On this basis, this article also expounded the significance of revising water environment standard and dividing water pollution controlling unit in the practical work and methods. Combining with working practice, the paper implemented specific solutions on prominent problems, including water quality security problems in drinking water sources, urban river water landscape problems, and water pollution problems caused by water conservancy projects. Research results of this paper provided learning experience in comprehensively controlling water pollution and implementing sustainable water conservancy concept, which has practical significance for improving water environment status quo in Qinhuangdao.

Keywords: Water source in Qinhuangdao, Present situation of water pollution, Analysis of countermeasures.

1. Introduction

Water is the source of all human civilization. Along with the advancement of new rural construction and industrial development, the appearance of Qinhuangdao is changing or about to change greatly. Increased settlement and residents living sewage challenged the city water environmental capacity. Increased factory area and drained sewage is also a big challenge. Therefore, research on present water pollution situation in Qinhuangdao has great significance on urbanization and stainable development process.

In recent years, the water pollution has been more and more serious and the city water capacity faced a great challenge in Qinhuangdao. In most water sources, the contents of heavy metals, ammonia nitrogen, total phosphorus, chemical oxygen consumption, Escherichia coli, cationic surfactants had different degrees of out limits. Qinhuangdao also faces varied, extensive, wide-spread pollutants, non-point monitoring source, complex management and control. According to the survey, most rivers around Qinhuangdao have different levels of pollution. This not only affect the residents' daily life, but also affect agricultural production in some extent. Deterioration of water environment in Qinhuangdao directly affects the urban construction and stability of economic development.

2. Current water pollution condition in Qinhuangdao

Nearly 30 years reform and opening up, industrial enterprise has obtained rapid development, social economy and people's living standards have markedly improved. And industrial enterprises as

an important part of the national economy also emerged under the wave of reform and opening up, thus speeded up the industrialization process. However, with speeding industrialization process in Qinhuangdao, pollution emissions are also increasing year by year.

General situation of water pollution: In 2008 there was 1.389 billion tons of wastewater, including 687 million tons industrial waste water emission, and control rate of industrial waste water was 92.98%; Urban sewage emission was 702 million tons, urban sewage concentrated rate was 39.14%. In 2008, chemical oxygen demand (COD) emission was 445300 tons, including 100200 tons of industrial waste water, which occupied 22.5% of the total emission. Domestic sewage was 345100 tons, which occupied 77.5% of the total emission. Ammonia nitrogen was 34300 tons, including 6200 tons industrial waste water, which occupied 18.08% of the total emission. Domestic sewage emission was 28100 tons, which occupied 81.92% of the total emission. Ammonia nitrogen in the domestic sewage emission was greater than industrial wastewater.

3. Causes analysis of current water pollution condition in Qinhuangdao

3.1 Causes analysis of water pollution.

The occurrence conditions, water-physical properties and hydraulic characteristics of underground water. There are two aquifers, plain pore phreatic aquifer and bedrock fissure phreatic aquifer. According to distribution characteristics and occurrence conditions, it also can be divided into three grades hydrogeological zones. Valley pore watersheds locate in valley plain and the quaternary system of tributary in the territory. Low hills fissure watersheds locate in downtown, suburban and exposed bedrock areas of low mountain foothills in the north. Low mountain fissure bedrock soluble watersheds locate in Yingshouyingzi Mining District and carbonate strata outcropped areas in the south.

The supplement of underground water is mainly from atmospheric precipitation. When bedrock fissure phreatic aquifer accepts atmospheric precipitation recharge, it usually supplies pore phreatic aquifer nearby in the form of lateral seepage or springs. Besides lateral seepage from bedrock fissure phreatic aquifer, mountain valley pore aquifer also accepts the recharge of upstream runoff groundwater. In the rainy season, it is directly recharged by atmospheric precipitation. Near the water source, because of strong exploration of groundwater, it forms a reverse seepage status in the surface water flow exploitation region. Besides downstream runoff discharge and consumption in evaporation, artificial mining has become an important drainage way for mountain valley pore water.

According to the above analysis on geological and hydrological conditions, groundwater pollution reasons in Qinhuangdao are mainly domestic waste, industrial waste water and local pollution caused by coal mining.

(1) Because that there is no advanced wasteyard currently in Qinhuangdao, living garbage can only end up with landfill, which caused that after rain leaking, pollutants in garbage infiltrated into groundwater and cause pollution. Refrigeration plant and plastic area were caused by this reason.

(2) Ammonia nitrogen and nitrite pollution in the two water source wells were mainly due to disruption of groundwater environment quality caused by coal mining. Qinhuangdao industry subject is coal mining. During the process of mining, a series of chemical reactions produced mine water contained a lot of pollutants. Because that mine water and surrounding rock fissure water has certain hydraulic relationship, so just pollutants were released into the shallow groundwater, resulting in the groundwater pollution system.

3.2 Awareness of water pollution problems.

In Qinhuangdao the government has deviations in awareness of environmental protection. Some of government officials pursue high GDP, nominate leaders ignoring environmental performance, or even adopt the practice of "beggar thy neighbor", discharging sewage to the public or near water area of rivers. If we don't change our opinion about the standard of GDP, the water pollution situation is difficult to change.

3.3 Inevitable causes of economic development.

Qinhuangdao city is still in the stage of accelerated industrialization and urbanization, buildings, railways, highways, airports and other infrastructure need spend a lot of energy resources, discharge

a large amount of waste. Rapid industrialization is a stage of great resource consumption and pollutant emissions.

3.4 Unreasonable industrial structure.

At present, the leading industry within a new round of economic growth in Qinhuangdao is heavy chemical industry. For example, the steel capacity has reached 1 billion tons and the output has reached 700 million tons. Cement output has reached more than 2 billion tons, accounting for 60% of the world. Production material consumptions and energy consumption per unit product of heavy chemical industry was obviously higher than light industry and agriculture, which means more waste discharged.

3.5 Technology of treating water pollution problems.

Technical level of water pollution control in Qinhuangdao is uneven, and both of advanced technology and backward technology exist. Although some international leading technology has appeared in our country, a large quantity of side wide or relatively backward technology exist. Some polluting enterprises do not have enough pollution control management and technology and risk a lot. On the other hand, extensive use of chemical fertilizers and large livestock farms also caused relatively serious pollution. Studies have shown that pollution from agriculture and rural have accounted for more than 50% of water pollution in Qinhuangdao.

3.6 Inefficient usage of environmental protection investment.

Industry about water pollution treatment is developing rapidly and the city sewage treatment plant construction is speeding up, which plays a positive role on the improvement of water environment quality. But on the other hand, the efficiency of special environmental protection fund need to be paid special attention. At the same time of increasing environmental protection investment, we should emphasize efficiency of funds, using as little money as possible to achieve the purpose of protecting environment.

3.7 Absence of social responsibility for some enterprises.

Environment is a kind of public goods with externality characteristics, it is also in the field of "market failure". Because of lacking ownership of environment, people tend to ignore or excessive use marine, rivers environmental resources. Any river does not belong to anyone, for example, it is easy to become a chemical waste emissions, resulting in a wide range of water pollution.

4. Solution analysis about water pollution treatment in Qinhuangdao

4.1 Adjustment of industrial layout and rationalization of industrial structure.

The polluters located in downtown or near water plant must be systematically migrated to industrial zone and facilitate centralized wastewater treatment, or change the product structure to reduce waste water emissions. The government should adopt the implementation of "close, stop, merge, turn" to some industries of poor resources use efficiency, economic efficiency and environmental efficiency. On the contrary, we should firmly support and foster, encourage the development of enterprises of high resources use efficiency, economic efficiency and environmental efficiency. For some industries which are highly resource utilization efficient and economic beneficial but discharge certain waste pollutions, we should give corresponding environmental governance investment and foster its development.

4.2 Non-point source pollution control and urban ordering unloading.

In the areas of thousands square kilometers, a considerable part has not been included in the distribution of city's waterways but distributed in all direction and disorderly flowed into the Bohai Sea through various channels. The main reason is imperfect urban sewage.

4.3 Perfect the environmental legislation, improve the pollution charge standard and achieve the goal of saving water.

Environmental protection is a basic national policy in our country. The leadership should stand in the height of the national laws and put environmental responsibility into the whole process of production, consider environmental index and economic index as equally important, and it is the premise. On this basis, we should enhance pollution charge standards, establish legal system of double control on pollutant total amount and concentration and discharge permit, form a complete set of

charges, which are slightly higher than treatment costs by their own and realize goals of saving water and self-management. The city should base on in-depth study and develop a suitable legal provisions to protect Pearl River.

4.4 Leading attention, management following and rely on technology progress.

Leading attention refers that in province, city and subordinate leadership, there is specially-assigned person stressing the environmental protection work, in enterprise leadership there is someone responsible for environmental protection. At the same time, we should monitor and predict the process of water quality changes through modern high-tech information system, feedback timely, prevent pollution accident. Comprehensive treatment of Bohai Sea must rely on scientific and technological progress closely and choose alternative technology innovation preferentially. Terminal treatment should turn pure purification treatment into recycling utilization as much as possible, break the industry frame, absorb advanced, practical and effective technology, and achieve the best environmental benefits with minimum capital investment.

4.5 Follow guideline of open source throttling on exploitation and utilization of resources simultaneously.

Develop water-saving activities, take effective measures to reduce water consumption at full blast. Enact water quota and water reuse rate per unit production, establish industrial water appraisal system, regulate the recycling utilization of industrial waste water including cooling water and process water, develop closed-circuit water circulation use vigorously, and minimize waste emissions.

4.6 Intensify management system and prevention.

In the same time of saving water and solving water shortage problems, intensity prevention and treatment of water pollution comprehensively, especially in key river basins. River basin management focuses on the downtown. Urban industrial wastewater and sewage treatment should combine centralized control and decentralized control, recycle the waste water. We should also adjust sewage treatment facilities to local conditions, and treated wastewater should be used for industrial cooling water, urban landscape and garden green space water, etc.

4.7 Establish and improve paid use system and price system.

State departments should organize to carry out resource pricing research, enact price policy of classification guidance in a planned way on the important resources related to national economy and people's livelihood and national scarce resources, change the concept that “Resource is priceless” as soon as possible and unreasonable situation of low prices products. At the same time, actively promote water resources capitalization management processes, strengthen research on resources accounting system, and create condition for accounting water resources into national economic accounting system.

4.8 Improve environmental economic policy.

Enact environmental economic policy beneficial to environmental protection and strengthen economic means in the system of market economy environment in a further place. Improve pollution charge standard as soon as possible and make it higher than pollution control cost; encourage and facilitate environmental protection infrastructure construction and management enterprise.

4.9 Promote clean production strongly.

Consider clean production as a comprehensive transformation in industrial enterprises under the guidance of sustainable development strategy, and implement clean production in all industrial enterprises in Qinhuangdao. By strengthening environmental management audit, establish scientific management system, promote industrial transformation to new technology basis, improve quality with intensive methods, reduce energy consumption, increase economic benefits, and build a conservation-minded ecological industrial production system gradually in Qinhuangdao.

4.10 Enhance rural non-point source pollution prevention and control.

Implement ecological agricultural production system to improve agricultural ecological environment and accelerate rural economic development. Comprehensively promote reasonable configuration of planting, breeding, processing- "Big agricultural production mode”, pay attention to comprehensive development on agriculture, forestry, animal husbandry and fishery, and multi-operation on farming, industry and business. Combine modern science and technology with

traditional agriculture essence, increase the use of organic fertilizer gradually, and reduce the use of fertilizers and pesticides. Develop biological pesticide technology, promote biotechnology of treating pest with bacteria pest and insect pest of alternative pesticides.

4.11 Accelerate construction of urban sewage treatment plants and develop environmental protection industry strongly.

Reform existing sewage treatment system, realize construction of sewage treatment plants, and realize socialization, marketization and enterprization of operation. Sewage treatment plant construction should be introduced competition mechanism, in accordance with the "who investment who owe, who management who benefit" principle, establish a mode of diversified investment construction, enterprise operation management, social common expenses, and necessary policy support by government. Explore integrative system management mechanism of urban water drainage construction and operation. Gradually liberate government out of direct management construction and operation of sewage treatment facilities and make wastewater treatment go to market truly.

5. Conclusion

In conclusion, we should aim at the phenomenon of serious water pollution in Qinhuangdao, find out the root of problems, suit the remedy to the case, try little detours or avoid detour, control the worsening situation as soon as possible by finding effective measures. Water environment is most intimate to citizens' production and living lives. Currently with today's social development, water pollution problem cannot be ignored. Each of us need absorb education and experience brought by pollution and make efforts to achieve the harmonious development of economy and environment in new future.

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