Problems and Countermeasures in Environmental Impact Assessment of Hazardous Waste Treatment Projects

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Abstract: With the rapid growth of China's economy and society, the amount of hazardous waste generated has shown an increasing trend year by year. Hazardous waste poses a serious threat to the environment and human health due to its unique physical, chemical, and biological properties, such as corrosiveness, toxicity, flammability, and reactivity. Therefore, safe and effective disposal of hazardous waste is crucial. The centralized incineration and disposal project of hazardous waste, as a common treatment method, has high environmental sensitivity and social attention. Environmental Impact Assessment (EIA) plays a crucial role in this process. EIA aims to assess the potential environmental impacts of proposed projects and propose corresponding prevention and mitigation measures, thereby providing scientific basis for decision-makers. EIA emphasizes seeking a balance between economic growth and environmental protection, which helps promote the sustainable growth of hazardous waste treatment projects and achieve coordinated growth of economy, society, and environment. This article explores the problems of EIA in hazardous waste treatment projects and proposes countermeasures.

1. Introduction

With the rapid growth of industrialization in recent years, China has generated a large amount of hazardous waste [1]. Hazardous waste has become an important issue that urgently needs to be addressed in environmental governance due to its corrosive, flammable, reactive, toxic, infectious and other hazardous characteristics [2]. If these hazardous wastes are not properly treated and disposed of, their harm to the environment and human health will be unpredictable, and may even cause serious ecological disasters [3]. In this context, the EIA work for hazardous waste disposal is particularly important. EIA, as a scientific method and means, can comprehensively predict and evaluate the potential environmental impacts of proposed projects or activities, and then propose corresponding prevention and mitigation measures. For hazardous waste disposal projects, EIA is an essential part. Through EIA, the potential impact of hazardous waste disposal projects on the environment can be evaluated, and scientific and reasonable disposal plans can be proposed, providing strong basis for the effective disposal of hazardous waste [4].

However, there are still some shortcomings in China's hazardous waste EIA at present [5]. Firstly, the methods and standards of EIA are not yet perfect. Due to the diverse types and properties of hazardous waste, it is necessary to develop corresponding EIA methods and standards for different types of hazardous waste. However, currently China's work in this area is far from sufficient, resulting in significant uncertainty and errors in the EIA process for some hazardous waste disposal projects. Secondly, the level of public participation is not high. EIA is a process of public participation that requires extensive solicitation of public opinions and suggestions. However, in practical operation, due to the low public awareness and participation in hazardous waste disposal projects, some important environmental issues are ignored or underestimated [6]. This not only affects the scientificity and impartiality of EIA, but also increases the environmental risks that hazardous waste disposal projects may bring [7].

In addition, there are differences in the understanding of the scope of hazardous waste

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management among different regions. Due to the involvement of multiple departments and regions in the management of hazardous waste, there may be differences in the scope and standards of hazardous waste management among different regions. This difference may not only lead to improper transfer and disposal of hazardous waste between different regions, but also pose potential risks to the environment. To address these issues, China needs to further strengthen its hazardous waste EIA work. The EIA work for hazardous waste disposal is an important task in current environmental governance in China. By improving the methods and standards of EIA, increasing public participation, and strengthening coordination and cooperation between different regions, scientific decision-making and effective implementation of hazardous waste disposal projects can be promoted, providing strong basis for the effective disposal of hazardous waste. At the same time, actively promoting the comprehensive utilization of hazardous waste can achieve resource recycling and sustainable growth of the environment, injecting new impetus into China's economic and social growth.

2. The Significance of EIA for Hazardous Waste Treatment

With the rapid growth of Chinese society and the acceleration of industrialization, the amount of hazardous waste generated has also shown a continuous growth trend [8]. These hazardous wastes not only have a large quantity, but also a wide variety, with strong corrosiveness, flammability, and explosiveness, posing a serious threat to human life safety and the ecological environment. Therefore, strengthening the EIA of hazardous waste and effectively treating and managing it is of great significance. Firstly, hazardous waste EIA can ensure the safety of human life. The toxic and harmful substances contained in hazardous waste, if discharged or disposed of without proper treatment, can easily enter the soil, water sources, and air, thereby endangering human health [9].

Secondly, hazardous waste EIA can promote the sustainable growth of industry. On the one hand, the arbitrary discharge or disposal of hazardous waste can cause pollution and damage to the environment, leading to ecological imbalance and resource waste; On the other hand, the treatment and management of hazardous waste also require a significant investment of funds and technology. If not handled properly, it will increase the operating costs and risks of the enterprise. Finally, the hazardous waste EIA is also an important measure to promote the construction of ecological civilization. Ecological civilization construction is an important component of China's modernization construction, and hazardous waste EIA is one of the important contents of ecological civilization construction. By strengthening the EIA of hazardous waste, we can promote the formation of green, low-carbon, and circular production and lifestyle, promote the positive interaction between economic and social growth and environmental protection, and achieve the goal of harmonious coexistence between humans and nature [10].

3. The Problems of Hazardous Waste EIA

EIA for hazardous waste is an important step in ensuring proper handling and management of hazardous waste. However, in practical operation, the evaluation process faces many problems and challenges, which not only affect the accuracy of the evaluation, but may also lead to an increase in environmental risks. In hazardous waste EIA reports, there is often a significant deviation between the production volume of hazardous waste and the actual production volume. A significant deviation between the evaluation report and the actual situation can lead to environmental management decision-making errors, which may cause environmental accidents or pollution problems. Hazardous waste needs to be classified according to existing classification rules and lists. However, these rules and lists often do not specify the specific form of hazardous waste, making it difficult to accurately determine the nature of waste in practical operations.

According to relevant laws and regulations, enterprises must obtain permits issued by relevant units before collecting, disposing of, and using hazardous waste. However, in the process of license approval, relevant units often fail to conduct sufficient research and evaluation on the enterprise's ability to receive and process waste, as well as the hidden dangers of hazardous waste treatment.

Lack of research on license approval may lead to enterprises exceeding their capacity to receive and process hazardous waste, increasing environmental risks. Many regions have not effectively controlled the management of hazardous waste, and only a certain scale of production enterprises are included in the hazardous waste management list. The hazardous waste generated by some small businesses has not been effectively controlled and managed, resulting in uncertainty in the quantity and destination of the generated hazardous waste. The uncontrolled management of hazardous waste in small businesses may lead to environmental accidents or pollution problems, and also increase the difficulty of environmental management.

4. Countermeasures for Improving Hazardous Waste EIA

4.1. Refine and Define Standards, Optimize Report Content

To ensure the accuracy and effectiveness of the hazardous waste EIA, it is necessary to first refine the definition standards for hazardous waste. This involves in-depth analysis and clear definition of the sources, types, forms, etc. of hazardous waste. Staff participating in EIA should conduct visits and investigations of hazardous waste production units based on their own work experience, combined with application data and relevant information, to ensure a comprehensive understanding of waste characteristics. The accuracy of data collection should be improved to ensure that the collected data can truly reflect the actual situation of hazardous waste. This includes detailed recording and analysis of the types, quantities, production processes, and treatment methods of waste. In response to the current problem of unclear classification of hazardous waste, the waste classification system should be further improved, and the characteristics and identification standards of various types of waste should be clarified. This helps to provide more precise basis for the formulation of subsequent governance strategies.

During the EIA process, research and evaluation on project site selection, scale, and process operations should be strengthened. By gaining a deeper understanding of the actual situation of the project, it is possible to more accurately predict the amount and treatment methods of hazardous waste, and thus develop more effective prevention and control measures. The EIA report is an important basis for guiding subsequent environmental governance work. Therefore, the quality of report preparation should be improved to ensure that the report content is comprehensive, accurate, and operable. This includes a detailed description of the sources, types, quantities, and treatment methods of hazardous waste, as well as predictions and assessments of environmental impacts, as shown in Figure 1.

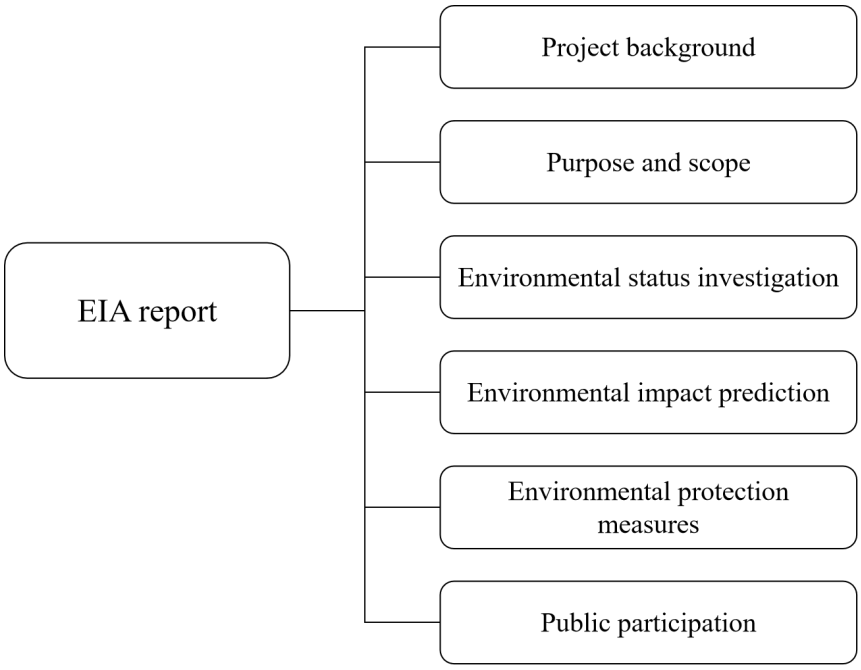

Figure 1 EIA report content

4.2. Increase Regulatory Efforts and Optimize Prevention and Control Measures

The regulatory authorities for hazardous waste disposal play a crucial role in ensuring environmental safety. To strengthen the management and prevention of hazardous waste, regulatory authorities should increase their supervision efforts and optimize prevention and control measures (as shown in Figure 2). Regulatory authorities should not only focus on large and medium-sized hazardous waste treatment enterprises, but also include small and micro enterprises in the scope of supervision. Although small and micro enterprises are relatively small in scale, they are numerous in number. If poorly managed, they can also have a serious impact on the environment. Therefore, regulatory authorities should strengthen their supervision of small and micro enterprises to ensure their compliance with relevant regulations and standards. Regulatory authorities should strengthen on-site inspections and law enforcement efforts on hazardous waste treatment units. By combining regular inspections and irregular spot checks, ensure that enterprises handle hazardous waste in accordance with prescribed standards and requirements.

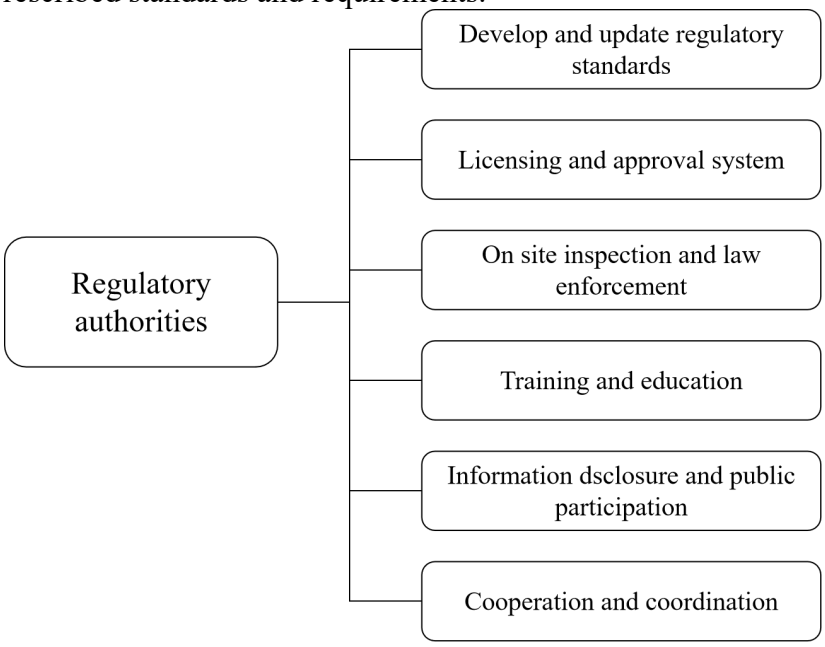

Figure 2 Prevention and control measures of regulatory authorities

Meanwhile, for illegal and irregular behaviors, they should be severely cracked down on and punished in accordance with the law. Encourage and support hazardous waste treatment units to adopt advanced technology and equipment to improve treatment efficiency and reduce environmental pollution. By promoting advanced treatment technologies and equipment, the amount and harmfulness of hazardous waste can be effectively reduced, and the impact on the environment can be reduced. Improving public awareness and prevention awareness of the hazards of hazardous waste is an important part of strengthening hazardous waste management. Therefore, regulatory authorities should strengthen publicity, education, and training, popularize knowledge and management requirements related to hazardous waste, and guide the public to actively participate in the prevention and control of hazardous waste. By refining and defining standards, optimizing report content, increasing regulatory efforts, and optimizing prevention and control measures, efforts can be made to effectively improve the environmental impact assessment of hazardous waste, enhance the level and effectiveness of hazardous waste management, and thus ensure the physical health of the people and the safety of the ecological environment.

5. Conclusions

With the rapid advancement of industrialization, China is facing the challenge of continuously increasing production of hazardous waste. These wastes have high-risk characteristics such as explosiveness, flammability, and strong corrosion, posing a serious threat to human life safety and

environmental quality. Therefore, government departments must increase efforts in the treatment and control of hazardous waste to ensure proper management and safe disposal of hazardous waste. Given the complexity and importance of current hazardous waste EIA work, government departments should give sufficient attention and importance. With the rapid growth of technology and the continuous emergence of new products, the types and characteristics of hazardous waste are also constantly changing, which makes EIA increasingly difficult. Therefore, both environmental protection departments and hazardous waste treatment enterprises need to constantly adapt to new situations, strengthen technological research and talent cultivation, and improve the scientificity and accuracy of hazardous waste EIA. In this process, we must adhere to the national concept of low-carbon, environmental protection, and green growth, increase investment, and promote innovation and application of hazardous waste treatment technologies. By improving treatment efficiency, reducing treatment costs, and reducing secondary pollution, continuously reducing the cost of hazardous waste management in enterprises, and enhancing the environmental risk prevention ability of hazardous waste. At the same time, it is necessary to strengthen policy guidance and support, encourage enterprises to increase investment in environmental protection, and promote the healthy growth of the hazardous waste treatment industry. In addition, it is necessary to strengthen public publicity and education, enhance public awareness and prevention awareness of the hazards of hazardous waste.

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