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Plan Measures for the Development of Energy Stockpiling Salt Sinkhole Thinking About Economic Advantages and Asset Usage

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Description

The use of underground salt caverns for the storage of oil and gas is becoming increasingly popular. The final storage capacity, financial benefits, and resource utilization of salt caverns are all directly correlated with the construction design. However, it is difficult to optimize each of the multiple combinations of multi-stage process parameters involved in the construction design through numerical simulations and indoor experiments. Using economic benefits and resource utilization as indicators, this paper attempts to present the fundamental principles of cavern construction design criteria in this regard. First, for five direct leaching stages, random groups of cavern construction process parameters, including inner tube depth, outer tube depth, oil pad depth, duration, and water injection flow rate, were generated. After that, using single-well salt cavern leaching simulation software batch processing yielded the cavern capacity, economic benefit, and utilization of the rock salt resource that corresponded to these process parameters.

The effects of lifting heights, inner tube and oil pad rates, and the distance between the inner tube and oil pad on anticipated economic benefits and salt resource utilization are then discussed. To increase expected revenue and resource utilization in the actual project, it is suggested to increase the distance between the inner tube and the oil pad, increase the ratio of oil pad lifting height to duration, and use the appropriate lifting height. The efficiency and scientificity of cavern construction design will be enhanced by this work, which will significantly influence the construction and design of salt caverns for energy storage. The final storage capacity, financial benefits, and resource utilization of salt caverns are all directly correlated with the construction design. However, it is difficult to optimize each of the multiple combinations of multi-stage process parameters involved in the construction design through numerical simulations and indoor experiments.

Using economic benefits and resource utilization as indicators, this paper attempts to present the fundamental principles of cavern construction design criteria in this regard. First, for five direct leaching stages, 1258 random groups of cavern construction process parameters, including inner tube depth, outer tube depth, oil pad depth, duration, and water injection flow rate, were generated. After that, using single-well salt cavern leaching simulation software batch processing yielded the cavern capacity, economic benefit, and utilization of the rock salt resource that corresponded to these process parameters. The effects of lifting heights, inner tube and oil pad rates, and the distance between the inner tube and oil pad on anticipated economic benefits and salt resource utilization are then discussed. To increase expected revenue and resource utilization in the actual project, it is suggested to increase the distance between the inner tube and the oil pad, increase the ratio of oil pad lifting height to duration, and use the appropriate lifting height. The efficiency and scientificity of cavern construction design will be enhanced by this work, which will significantly influence the construction and design of salt caverns for energy storage.

Antibiotics have revolutionized medicine and saved countless lives by treating and controlling bacterial infections. However, antibiotic misuse in agriculture, animal husbandry, and medical care has resulted in the presence of antibiotic residues in humans, animals, and plants Microorganisms that are exposed to antibiotics can acquire antibiotic resistance genes Through horizontal gene transfer and vertical gene transfer can replicate and spread with microorganisms in the environment, causing even more microorganisms to develop resistance now recognized as emerging environmental pollutants because this clearly poses a serious threat to human health and ecological security

Antibiotics and ARGs have been found in a variety of environmental media, including natural water sediment, soil, and domestic sewage and the results of environmental sample monitoring. The primary locations for collecting and treating municipal domestic sewage are wastewater treatment plants,The majority of pollutants in wastewater, including N, P, and organic pollutants, can be removed through the biological treatment process [1,2].

We used Gephi to visualize the patterns of co-occurrence between subtypes and microbial communities in order to further use correlation analysis to examine the connections between microbes, , and resistance happening with microscopic organisms genera in influent examples archaea, and infections genera in influent examples) were broke down in light of organization examination by Pearson relationship examination. The network of bacteria and ARGs had 109 edges and 100 nodes as depicted . bacterial genera, may contain more than two ARG subtypes. The majority of the subtypes were linked to antibiotic efflux and inactivation mechanisms. These microbes contained contained and contained Many microbial species carried these three subtypes, suggesting that microorganisms were more likely to act as hosts for these three ARG subtypes despite the low abundance of these three subtypes., and Cupriavidus were among the 62 bacterial genera that carried more diverse ARG isoforms than the other genera The majority of the 62 bacterial genera were categorized into the Proteobacteria and Firmicutes phyla. The network of archaea, viruses, and ARGs depicted in Figure 6B. The antibiotic efflux and inactivation mechanisms remained dominant among the 36 ARG subtypes. Methanosarcina possessed three resistance mechanisms antibiotic inactivation, antibiotic efflux, and antibiotic target protection along with four species Methanosarcina had a high abundance in both the influent and the effluent, according to an analysis of the microbial community structure. Its abundance in the effluent was higher than in the influent, indicating that the removal effect of Methanosarcina by the ozonation process in this study was lower than that of other archaeal genera.

Antibiotic efflux pumps, antibiotic target protection, and antibiotic inactivation have been identified as the primary mechanisms by which bacteria develop antibiotic resistance. The subtypes of ARGs found in this study included medication obstruction systems. TPM of ARGs with antibiotic inactivation mechanisms were found in the influent, followed by target protection mechanism, efflux pump mechanism, target alteration mechanism, and target replacement mechanism. With an antibiotic inactivation mechanism also had the highest abundance in the effluent. The findings demonstrated that the antibiotic inactivation mechanism by which the ARGs in the wastewater treatment plant primarily caused microbial resistance. Through an antibiotic inactivation mechanism, microbes frequently develop resistance to aminoglycosides, -lactams, and macrolides. Another mechanism of antibiotic resistance examined in this study, antibiotic target protection, is frequently associated with microbial resistance to erythromycin antibiotics. Antibiotic efflux has long been thought to be the main way that multiple antibiotic resistances can develop at once, including those to tetracyclines, macrolides [3-5].

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Conflict of Interest

There are no conflicts of interest by author.

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