SUBMISSION FOR EVALUATION

FINAL YEAR PROJECT 2 - RESEARCH PROPOSAL

{ THE EFFECT OF DOLOMITE TREATMENT ON SALINITY REDUCTION, PH STABILIZATION, AND WATER QUALITY IMPROVEMENT TOWARD POTABLE WATER STANDARDS **}**

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THE EFFECT OF DOLOMITE TREATMENT ON SALINITY REDUCTION, PH STABILIZATION , AND WATER QUALITY IMPROVEMENT TOWARD POTABLE WATER STANDARDS

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Final Year Project Proposal Submitted In
Partial Fulfillment Of The Requirement For The Degree Of Bachelor of Science (Hons)
Chemistry With Management
In The Faculty Of Applied Science University Teknologi Mara

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This Final Year Project Report Entitled "The Effect of Dolomite Treatment on Salinity Reduction, pH Stabilization, and Water Quality Improvement Toward Potable Water Standards" Was Submitted By Nur Aina Athirah Binti Mat Zainol In Partial Fulfilment Of The Requirements For The Degree Of Bachelor Of Chemistry With Management (Hons.) Applied Chemistry, In The Faculty Of Applied Sciences, And Was Approved By

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ABSTRACT

The increasing demand for safe and clean water has intensified due to rising salinity and acidity in natural water sources. This study evaluates the potential of dolomite, a naturally occurring carbonate mineral composed primarily of calcium and magnesium, as a treatment material for pH stabilization and partial salinity reduction in different water systems.
Three types of water samples were investigated: synthetic saline water, acidic rainwater, and domestic tap water. Each sample was treated with varying dolomite dosages and contact times to examine changes in pH, total dissolved solids (TDS), and major ion concentrations. Water quality analysis was conducted using a pH meter, TDS meter, flame photometer for sodium (Na^+) determination, and Inductively Coupled Plasma–Optical Emission Spectrometry (ICP-OES) to measure calcium (Ca^{2+}) and magnesium (Mg^{2+}) concentrations.
The results demonstrate that dolomite effectively neutralizes acidic rainwater by increasing pH toward near-neutral conditions. In synthetic saline water, partial reduction of sodium concentration and TDS was observed, attributed to cation exchange between Na^+ ions and Ca^{2+}/Mg^{2+} ions released from dolomite. For tap water, moderate and controlled changes were recorded, indicating that dolomite functions primarily as a stabilizing and mineral conditioning agent.

However, in high-salinity systems such as seawater, the reduction in salinity was limited due to equilibrium and ion saturation effects. Overall, the findings indicate that dolomite serves as a cost-effective and environmentally friendly material for pH stabilization and ionic conditioning, particularly in acidic and moderately saline water systems, but it is not suitable as a complete desalination method.