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Low Bay Regional Geology and Surrounding District, Nan Gedang District, Sorolangon District, Jambi Province and Andesit Resources Potential using Geolistric District, Ciwandan District, Cilegon District, Jambi Province and Andesit Resources Potential using Geolistric District, Ciwandan District, Cilegon District, Jambi Province

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ABSTRACT

The results of previous researchers still disagree about the age and stratigraphic relationship of the Muara Enim Musper Formation (1937), Marks (1956) interpreted middle Miocene age, while De Coster (1974) Saito, Saito (1985) interpreted middle Miocene-Pliocene age.

Detailed geomorphological discussions can be described and mapped based on the distinguishing characteristics. Geomorphological units of the study area can be grouped into 2 (two) geomorphological units based on the landscape formation genes proposed by Davis (1954) in Thornburry (1967) which include aspects of structure, process and status and then this principle is then elaborated by 19 Lobeck with a landscape classification natural.

In the context of regional autonomy, the potential for minerals is one of the assets that needs to be utilized. To utilize the potential of mining excavation in the Ciwandan area and its surroundings, Ciwandan District, Cilegon Regency, Jambi Province. This activity needs to be carried out in advance research and study of its development prospects and be prepared in a concise, concise and systematic manner.

In evaluating andesitic deposits in the study area, in relation to other uses, an analytical method is needed. This analysis method includes field observations, petrographic observations and physical rock observations.

KEYWORDS: *Low Bay Area Geology and Adensit Resource Potential*

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1. Background

Teluk Bawah Village and its surroundings, Cermin Nan Gedang Subdistrict, Sarolangun Regency, Jambi Province, is an area located in the Lowlands and Hilly Zones according to van Bemmelen (1949. This zone is spread along the east coast of Sumatra Island. This zone consists of undulating hills extending from northwest-southeastst, Stratigraphically, the rock structure in the Lowlands and Hilly Zones from the oldest to the youngest are: Peneta Formation, Talang Akar Formation, Baturaja Formation, Gumai Formation, Benakat Air Formation, Muara Enim Formation and Kasai Formation. from previous researchers there are still disagreements about the age and stratigraphic relationship of the Muara Enim Musper Formation (1937), Marks (1956) interpreted middle Miocene age, while De Coster (1974) Saito, Saito (1985) interpreted middle Miocene-Pliocene age.

Based on the differences of opinion regarding the formation of Muara Enim located in the Lowlands and Hilly Zone, the authors are interested in conducting research and geological mapping in the lower and surrounding Gulf areas, the Nan Nan Gedang District, Sarolangun Regency, Jambi, where this research is aimed at knowing and ensuring the stratigraphic position between the formations and the age of the rocks in the study area.

2. Problem Formulation

In carrying out a geological research activity in an area, a classification must be made of the data or geological aspects that will be taken as data from the research.

Research carried out in the lower and surrounding Gulf areas, Cermin Nan Gedang District, Sarolangun Regency, Jambi has various problems that must be solved, including:

1. The process of forming landscape (geomorphology) in the study area which is controlled by its structure, geomorphological process and geomorphic stage.
2. The rock structure in the study area, both vertical and lateral distribution of rock layers, rock unit age, depositional environment and stratigraphic relationship.
3. Geological structures that develop in the study area are quite interesting where older rocks are raised to the surface above younger rocks.

3. Purpose and Objectives

The purpose of geological research and mapping in the Lower Teluk area and its surroundings, Cermin Nan Gedang District, Sarolangun Regency, Jambi is to know the geological conditions of the area which includes the history of landscape development (paleogeography), the history of basin development, and the history of tectonic development.

In this study the authors also conducted a special study on the Calculation of Andesite Resources by the Geoelectric Method, Ciwandan District, Cilegon Regency, Banten Province.

4. Geomorphology of Research Areas

Based on the division of van Bemmelen's physiographic zone (1949) as described above and taking into account the forms of landscape and rocks that make up the landscape in the study area, the research area is in the Hilly Lowland Zone.

From the appearance of physical characteristics in the field, the research area generally has the form of ridge and valley morphology, extending from Southeast - Northwest, which is arranged by intermittent rocks. coal insert (Muara Enim Formation) These hills are composed of folded sedimentary rocks forming fold and fracture structures. As for the alluvial plate morphology, it is encountered in the northwest-southeast part of the map sheet.

Detailed geomorphological discussions can be described and mapped based on the distinguishing characteristics. Geomorphological units of the study area can be grouped into 2 (two) geomorphological units based on the landscape formation genes proposed by Davis (1954) in Thornburry (1967) which include aspects of structure, process and status and then this principle is then elaborated by 19 Lobeck with a classi fi cation of landscape natural. The geomorphological units of the study area are (Appendix 3 Geomorphological Map):

1. Geographfological Units of Folding Fault Hills.
2. Alluvial Plain Geomorphology Unit.

Geomorphology of folding hills The faults in the study area are controlled by structures in the form of folds and faults which produce a form of northwest-southeast trending hills. This geomorphological unit is composed by a unit of rock Sandstone Hose - alternating Flakes inserts Foramasi Peneta and Sandstone Unit Tufaan Sandstone Hose intermittent Sandstone Insertion Muara Enim Formation.

The distribution of this unit in the study area covers 93% of the area of the study area and the geomorphological map is colored purple. This unit's morphometry is at an altitude of 100-300 meters above sea level with a slope ranging from 160-350. (Classification of van Zuidam 1985).

The geomorphic unit of the unit is in the adult stage. Shown with landscapes that have been changed from the original, where the hills have eroded until relatively sloping.

5. The Potential of Andesite Resources by the Geoelectric Method

The availability of data or information regarding the exploration of mineral resources especially mineral C (andesite) will continue to grow along with the increasing needs of the community for mining commodity commodities and is one important factor in efforts to promote the potential of minerals.

In the context of regional autonomy, the potential for minerals is one of the assets that needs to be utilized. To utilize the potential of mining excavation in the Ciwandan area and its surroundings, Ciwandan District, Cilegon Regency, Jambi Province. This activity needs to be carried out in advance research and study of its development prospects and be prepared in a concise, concise and systematic manner.

By empowering the potential of mining materials (andesite), it is hoped that it will improve people's lives and lead to economic development in the local area, and all types of rocks have different physical properties. Its durability and hardness are determined by the density and types of minerals that make up rock formation. Because it is in accordance with the type of use, each type of rock has a carrying capacity and endurance that is not the same strength. To facilitate the evaluation of andesit reserves in the research area, a systematic evaluation of reserves in a region is needed.

6. Analysis Method

In evaluating andesitic deposits in the study area, in relation to other uses, an analytical method is needed. This analysis method includes field observations, petrographic observations and physical rock observations.

6.1. Field Observation

Done to find out the position and distribution in the field. The relationship is in the calculation of reserves, whether sufficiently economical or not, and estimates what mining methods are most suitable to be more economical.

6.2. Petrographic Observations

Rock samples are sliced thin (0.030 mm), and placed in pieces of glass resembling preparations, then using a polarisator microscope the structure, texture, mineral composition and results of the changes are determined. Thus it can be determined with certainty the type and name of the rock.

6.3. Observation of Physical Properties of Rocks

This work aims to determine the physical properties of rocks, which are based on incisions and applicable Indonesian industry standards (SII).

The rock physics analysis includes the work:
1. Uniaxial Compressive Strength
2. Wear Resistance ("A ratio")
3. Water Type and Distribution ("Gravifity and Water Specification Specifications")
4. Eternity with Sodium Sulfate Solution ("Sulfhate Soundness")
5. Destruction with Bajana Rudolp.

6.4. Uniaxial Compressive Strength

Standard procedure or method used:
1. ASMT E 4 - 64
2. BS 1610 - 1964, grade A
3. SSI 0378 - 80

Equipment used :
1 set of "Uniaxialcompressive test", with the name "Wer Nurn BRG"

Implementation Brief:
Rock samples are prepared and should not be longer than 30 days to maintain its water content. Determine the diameter of the rock sample height. Place it on the compression device with the axis of the sample parallel to its center.

Associate with measuring sample changes to the reading unit. Give a burden without stop until the automatic reading does not work anymore and note how much the load is.

6.5. Wear Resistance (Abrassion)

Standard Procedure or Method used:
- AASHTO T 96 - 74 - PB 0206 - 76
- ASTM C 131 - 69 - SII 0306 - 80
- ASTM C 353 - 69 - SII 0079 - 75

Equipment used :
- Los Angeles machines - Steel balls
- Filter No. 12 - Oven with temperature control

Implementation Abbreviations Description: The test object is cleaned and dried in the oven until the weight remains. Then the test pieces and steel balls are inserted into the Los Angeles machine. Engine speed with a speed of 30 - 33 rpm (500 - 1000 revolutions), after completion of rotating the test specimen is removed from the machine and filtered with a filter no. 12. Granules attached to the top are washed thoroughly, then dried in the oven until the weight remains. Result of the investigation:

Information :
a = Weight of tested object (gram).
b = Weight of test specimen against filter 12 (grams).

6.6. Specific Gravity and Water Absorption

Standard Procedure / Method used:
- AASHTO T 85 - 78 - ASTM C 129 - 68
- AASHTO T 84 - 78 - PB 0 202 - 76
- ASTM C 127 - 68 - SII 0 378 - 80

Equipment used:

A. Rough Aggregate:
- Wire basket with a capacity of ± 5 kg - Oven
- Water pipes equipped with pipes - Separator for samples
- Scales with work bag - Strainer No.12

B. Fine Aggregate
- 1kg capacity scales - Temperature gauges
- 500 ml pycnometer - Trays
- Beheaded cone (Cone) of thick metal - Vessel where water
- Punching rod - "Vacuum pump" / stove
- Filter No.4 - Distilled water
- Oven

6.7. Rough Aggregate

BRIEF DESCRIPTION OF WORK: The test object is washed to remove dust, dry it in the oven until the weight remains. Refrigerate ± 1-3 hours then weighed (BK). Soak the test object at room temperature for ± 24 hours. Remove the test specimens from the water, wipe with an absorbent cloth until the membrane of water on the surface is lost (SSD) and for large grains dried one by one. Weigh the test object saturated surface (Bj). Put the test specimen in the bed, shake the rock to remove the absorbed air then determine the weight in water (Ba) and the size of the temperature.

Investigation Results:

$$\text{Bulk Specific Grafity} = \frac{Bk}{B-Ba}$$

$$\text{Absorption (Water Abration)} = \frac{Bj - Bk}{Bj} \times 100\%$$

6.8. Fine Aggregate

A brief description of the implementation: Dry the test object in the oven until the weight remains, cool at room temperature, then soak in water for ± 24 hours. Dispose of the water carefully, do not get it until the grains disappear. Spread the aggregate in the tray, dry it in the air by reversing the specimen until the saturation surface is dry. Check the situation by filling the test specimen into the cone stick.

A saturated surface dry state is achieved when the test object collapses but is still in a cracked state. Insert 500 grams of the test specimen into the pycnometer.

Enter distilled water until it reaches 90% contents of the Pycnometer. Rotate while shaking until there are no air bubbles in it. Immerse the pycnometer in water and measure water temperature. Add water to the limit then weigh Pycnometer + test object (Bt). Remove the test specimen, dry it in the oven then chill it in the Dissociator and weigh it (BK). Determine the weight of the pycnometer with full water and the size of the temperature (B). Investigation results:

$$\text{Bulk Specific Grafity} = \frac{Bk}{(B + 500 - Bt)}$$

$$\text{Absorption (Water Abration)} = \frac{500 - Bk}{Bk} \times 100\%$$

6.9. Conservation of Sodium Sulfate (Sulfate Soundnes) Solution

Standard Procedure or Method used:
- AASHITO T 104 - 77
- AAL 0088 - 75
- SSI 0378 - 80

Equipment used :
- Fine Sieve No. 100, 50, 3390, 16, 8, 5, 4. - Grail - Grail.
-Oven.
- Rough Sieve No.
-Shive Shaker.

Implementation Outline: The examined aggregates are washed thoroughly with water and dried in an oven for 18 hours. After drying the whole aggregate is soaked again. Repeat 5 times.

Investigation results:
Dry weight before inspection = a gram
Dry weight after 5 periods = b gram
Soaked in Sulphate's solution
Weight loss due to Sulphate's solution = a - b

---------- X 100%
A

6.10. Destruction with Rudeloff Vessel

Standard Procedure or Method used:
- SII 0052 - 80
- SII 0399 - 80
- SII 0080 - 75

Equipment used
- 1 set of Rudelof laver
- Siever 2 mm

7. Discussion

Distribution of Andesite Raw Materials in the Study Area

In the research area, the spread of building raw materials is in the form of larval flow (attachment layer 5), which is composed of andesite. This rock is formed as a result of the freezing of magma on the surface of the earth as melted lava, so that the mineral cystal is smooth consisting of faldspar-plagioclase, a little quartz pyroxene and glass.

The distribution of andesite rocks in the study area is quite extensive and consists of two hills. Although the overburden is quite thick, in many places there are Classes and Quality of Concrete Hardness with Rodoleff Pressure Vessel Destroyed Particles of the Sieve 2 mm Maximum% Hardness with Los Angeles Slide, Los Angeles Parties Destroyed Particles of the Sieve 1.7 mm Maximum% of Particle Faction 19- 3 mm Grain Friction 9.5-19 mm 1 2 3 4 First class concrete and BI concrete quality 22-30 24-32 40 = 50 Class II concrete and or concrete quality K125, K175 and K225 14-22 116-24 27- 40 Class II concrete and/or quality concrete above K225 or compressed concrete Less than 14 Less than 16 Less than 27 64 are clearly caught. There are many outcrops on the escarpment slopes, some are weathered and in some places still fresh.

Physical Appearance on Rocks

The Andesite stone in the study area, solid black and greenish solid and hard, although subtle but clearly visible mineral keristal. At the time of Plio-Plistones tectonic has been disturbed by tangesial pressure (horizontal pressure) until the occurrence of vertical cracks. As a result large rocks are hard to find.

Nevertheless this rock can still be used for building materials according to their uses. The existence of cracks makes it easy for mining and processing rocks into various sizes according to demand.

Reserve Calculation

Calculation of reserve volume is based on the contour method according to Craft and Hawkines. In this case the calculated contour is the contour at an altitude between 80-250 Bukit campangkana. While the reserve area calculation is done by the greet method. The volume and area of andiset stone reserves and ground cover contained in the study area can be seen in Tables 4 and 5. For the calculation of the volume of each contour, it is done by assuming the shape/body of spreading of the pieces in the form of triangular cylindrical tubes.

Formula :
Peak, Vo = 4/3 (lk A0) So A0 / A1> 0.5 then:
V = ½. H (lkA0 + lkA0)
If the area of A0 / A1 <0.5 then: V = 1/3. H (lkA0 + lkA1 + 65

Information:
V = Reserve Volume
Vo = Peak Contour Volume
A0 = Contour Area 0
A1 = Contour Area 1
Net volume = Andesite authorization volume - Ground cover volume
Net volume = 26111487.32 - 10795449.22 = 15316038.1
Volume = 15316038,1
Error Factor 10% = 1531603.81
Net Volume = 13784434.29
Andesite Specific Gravity = 2.3 tons / m3
Andesite Reserves = Net Volume x BJ
= 13784434.29X 2.3 tons / m3
= 31704198,867 tons

8. Conclusion

From all the series of studies that have been carried out, in the form of surface geological mapping in the Low Bay area and its surroundings, the District of Nan Nan Gedang, Sarolangun Regency, Jambi, relating to geomorphology, stratigraphy, geological structure and geotourism potential are summarized as follows:

1. Morphogenically, the research area can be divided into 2 Geomorphological Units, namely the Faulted Hills Geomorphology Unit with adult geomorphic states, the Alluvial Plain Geomorphological Unit with young stadia.

The Daera river flow patterns are divided into two

A. Trellis flow patterns are controlled by syncline and anticline structures and lithology and rock hardness.
B. Rectangular flow pattern is a river flow pattern forming a obtuse angle
with the main river, and controlled by geological structures in the form of burly (fracture) and fault (fracture).

The genetics of rivers that develop are subsequent, consequent, and obsessive.

River erosion levels include young stadia and old erosion stage.

2. The rocks found in the research area are lithostratigraphically from the oldest to the youngest, which can be grouped into 4 Rock Units, namely: claystone units of shale, sandstone and limestone inserts (Peneta Formation) deposited when the Early Limestone Middle Bathial Zone; limestone inserts sandstone rock units (Benakat Air Formation) deposited at the time of Middle Miocene - Late Miocene was deposited on the environment of the Outer Netritic Threshold; tuffaceous sandstone unit rock inserts claystone (Formation 68 Muara Enim) deposited at the time of the Late Miocene - Pliocene deposited in the environment of the Outer Netritic Threshold; and alluvial deposits.

3. The geological structure in the area of the study area is the anticline of the high mine, the fault of the flat bay flat, the fault of the mine rises high and the fault rises the Asai stem. The geological structure of the study area occurs at the time of Pliocene - Plistocene with the main force direction N 60 o E or directed southwest-northeaststst.

4. Geologically the area of Ciwandan Subdistrict and its surroundings has a very large andesite resource potential, this measurement uses a geoelectric method with 2 (two) measurement points that produce an initial (Terekah).

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