GEOLOGY, MINING AND PROCESSING

OF

OKHARE LIMESTONE DEPOSIT, HETAUDA

CENTRAL NEPAL

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ABSTRACT

The purpose of the study is to clarify the regional geology around Okhare Limestone Deposit, to evaluate the quality and reserve of Okhare deposit, and having a general understanding of mining and processing of Limestone by HCIL.

About 59 km^2 area was mapped during the fieldwork. Three limestone deposits was studied during this work: Okhare, Bhainse and Majuwa. Okhare and Bhainse belongs to the Okhare-Kitni range of Bhainsedobhan Marble and Majuwa Limestone belongs to the Jhiku Bed of Benighat Slate.

The study area is separated by two thrusts MBT and MT and divided into three tectonic zones. Southern part of the area consists of sedimentary rocks of Siwalik Group, which followed to the north by low-grade metamorphic rocks of Midland Group and around Bhainse area, northern part of the study area, medium to high-grade metamorphic rocks of Bhimphedi Group are exposed. The general trend of the rocks of the study area is NW-SE with dip amount being around $40^0 - 75^0$. The area is of high tectonic activity because of the presence of MBT, MT, numerous folds, faults and landslides in the area.

Okhare Limestone Deposit is a sedimentary-metamorphic deposit showing well developed crystals of calcite presenting as a outlier at the top of the Chattre Bhanjyang hill. Okhare deposit consists of light to dark-grey, medium to coarse-grained Limestone bands which vary in the content of Cao% and $Sio_{2\%}$. Phyllitic Limestone is its notable characteristic. Phyllite is present as spot, lenses within the bed and coatings on the bedding plane looking phyllitic bed. The strike of the bed is NWW – SEE and average dip amount being 45^0 with 46.5% of Cao and 1.30% of Mgo with the hill slope of $50\text{-}75^0$. Reserve of the deposit was estimated by cross-sectional method. Total reserve is 15.33 million ton with 13 million ton at 85% recovery factor. The ratio of volume of Limestone to waste is 1:0.32.

Area above 1900m (above sea level) of the area is proposed for mining with the area of 1,90,000 sq.m. This deposit is not yet been worked. Okhare deposit will be worked by opencast method with bench cut as quarrying method. 5m height and 20 – 25m width benches with at least two quarry face will be made for quality control. Drilling, blasting and loading are main works in mining.

Limestone is processed from mine to packing unit as cement through Primary Crusher, Secondary Crusher, Mixing Hopper, Grinding Mill, Blending Silo, Rotary Kiln, Clinker Silo, Cement Mill Silo and Packing Unit.

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LISTS OF ABBREVIATIONS

Calc. - Calcareous

HCIL – Hetauda Cement Industry Limited

IBM - Indian Bureau of Mines

MBT – Main Boundary Thrust

MT – Mahabharat Thrust

NBM – Nepal Bureau of Mines

tpd – Ton per day

UNDP – United National Development Project

VDC - Village Development Committee

qtz. – Quartz

calc. – Calcite

mu. - Muscovite