

GEOLOGI, ALTERASI HIDROTERMAL DAN MINERALISASI BIJIH ENDAPAN  
EMAS EPITERMAL SULFIDASI TINGGI PIT RAMBA JORING, DESA AEK  
PINING, KECAMATAN BATANGTORU, KABUPATEN TAPANULI SELATAN,  
PROVINSI SUMATRA UTARA

Oleh:

**Sylvia Yanti Manurung**

(15/385086/TK/43748)

Departemen Teknik Geologi, Fakultas Teknik, Universitas Gadjah Mada

\*e-mail: [sylviamanurung28@gmail.com](mailto:sylviamanurung28@gmail.com)

Pembimbing: **Dr. Arifudin Idrus, S.T., M.T.**

### SARI

Pit Ramba Joring di Desa Aek Pining, Kecamatan Batangtoru, Kabupaten Tapanuli Selatan, Provinsi Sumatera Utara memiliki zonasi kadar Au yang berasosiasi dengan urat dan batuan sampling yang mengalami alterasi dan oksidasi tinggi. Penelitian ini bertujuan untuk mengetahui kondisi geologi yang mengontrol alterasi dan mineralisasi, karakteristik alterasi dan mineralisasi bijih, asosiasi unsur Au terhadap Cu dan genesa endapan emas epitermal sulfidasi tinggi di daerah penelitian. Pengambilan sampel dilakukan secara sistematis menggunakan metode *grid soil sampling* dan *anaconda mapping*.

Identifikasi batuan dilakukan dengan mengintegrasikan hasil analisis laboratorium yang terdiri dari petrografi, mineralogi bijih, ASD, dan FA-AAS. Hasil penelitian menunjukkan bahwa geologi daerah penelitian berupa kubah intrusi yang tersusun oleh litologi berupa satuan andesit hornblenda, breksi matriks pasir dan breksi multi fase lempung dengan struktur geologi terdiri dari kekar (*pre-mineralisasi*), sesar geser sinistral (*syn-mineralisasi*) dan sesar normal diperkirakan (*post-mineralisasi*) berarah timur laut-barat daya. Tipe alterasi yang berkembang terdiri dari zona argilik (ilit-smektit+kaolinit+ilit), argilik lanjut (silika+dikit+alunit+kaolinit) dan silika *vuggy*-masif. Mineral bijih yang dijumpai berupa emas, enargit, kovelit, pirit, goetit, hematit dan jarosit sementara mineral *gangue* yang dijumpai berupa kuarsa, kaolinit, ilit dan smektit. Kadar Au diperoleh 4 golongan, yaitu *waste rock* (<0,8 ppm), *low grade* (0,8-1,5 ppm), *medium grade* (1,6-2,5 ppm), dan *high grade* (>2,5 ppm). Keterdapatan emas umumnya berasosiasi dengan mineral enargit sebab dijumpai kadar unsur Au dengan kadar *high grade* (61,05 ppm) dan unsur Cu dengan kadar 0,675 % pada bagian timur daerah penelitian. Berdasarkan karakteristik tersebut dapat diketahui bahwa daerah penelitian termasuk endapan epitermal sulfidasi tinggi dengan proses pembentukan kedalaman *paleosurface* dangkal-intermediet.

**Kata Kunci:** Pit Ramba Joring, *anaconda mapping*, epitermal sulfidasi tinggi

*GEOLOGY, HYDROTHERMAL ALTERATION AND ORE MINERALIZATION GOLD  
DEPOSIT OF EPITHERMAL HIGH SULFIDATION PIT RAMBA JORING, AEK  
PINING VILAGE, DISTRICT BATANGTORU, SOUTH TAPANULI REGENCY, NORTH  
SUMATERA PROVINCE*

By:

**Sylvia Yanti Manurung**

(15/385086/TK/43748)

Departemen Teknik Geologi, Fakultas Teknik, Universitas Gadjah Mada

\*e-mail: [sylviamanurung28@gmail.com](mailto:sylviamanurung28@gmail.com)

Advisor: **Dr. Arifudin Idrus, S.T., M.T.**

**ABSTRACT**

*Ramba Joring Pit in Aek Pining, Batangtoru, South Tapanuli Regency, North Sumatra Province has zoning of grade Au associated with veins and wall rocks which have high alteration and oxidation. This study aims to determine the geological conditions that control alteration and mineralization, alteration characteristics and ore mineralization, the association of Au elements against Cu and the genesis of high epithermal sulfidation gold deposits in the study area. Sampling was carried out systematically using soil sampling and anaconda mapping methods.*

*Rock identification is done by integrating the results of laboratory analysis consisting of petrography, mineralogy of ore, ASD, and FA-AAS. The results showed that the geology of the study area was an intrusion dome composed of lithology in the form of andesite hornblenda units, sandy matrix breccia and clay multi phase breccia with a geological structure consisting of joints (pre-mineralization), sinistral shear fault (syn-mineralization) and normal fault estimated (post-mineralization) trending NE-SW. The type of alteration that develops consists of the argillic zone (illite-smectite + kaolinite + illite), advanced argillic (silica + dickite + alunite + kaolinite) and vuggy-massive silica. Ore minerals found in the form of gold, enargite, covellite, pyrite, goethite, hematite and jarosite while gangue minerals found in the form of quartz, kaolinite, illite and smectite. Grade of Au obtained 4 groups, namely waste rock (<0,8 ppm), low grade (0,8-1,5 ppm), medium grade (1,6-2,5 ppm), and high grade (> 2,5 ppm). The density of gold is generally associated with enargite mineral because it is found in the garde of Au with high grade (61,05 ppm) and Cu elements with a concentration of 0,675 % in the eastern part of the study area. Based on these characteristics, it can be seen that the research area includes high sulfidation epithermal deposits with the formation of shallow-intermediate paleosurface depths.*

**Keywords:** *Ramba Joring Pit, anaconda mapping, epithermal high sulphidation*