

INTISARI

Kementerian Pekerjaan Umum dan Perumahan Rakyat (PUPR) berencana membangun konstruksi terowongan jaringan irigasi, di daerah irigasi Air Alas, Kabupaten Seluma, Provinsi Bengkulu. Kondisi geologi teknik daerah belum diketahui secara detail, oleh karena itu penelitian dilakukan untuk menentukan karakteristik geologi teknik daerah sekitar rencana lokasi terowongan jaringan irigasi. Selain itu juga ditentukan kualitas massa batuan bawah permukaan sepanjang rencana jalur konstruksi terowongan jaringan irigasi. Data yang digunakan dalam penentuan karakteristik geologi teknik ditinjau dari beberapa aspek, meliputi aspek geomorfologi, aspek batuan, aspek struktur geologi, dan kondisi airtanah (hidrogeologi). Metode penelitian yaitu pemetaan geologi teknik dengan skala 1: 5000 untuk mengetahui karakteristik geologi teknik dengan metode *Geological Strength Index* untuk menentukan kualitas massa batuan permukaan dan bawah permukaan.

Hasil penelitian menunjukkan bahwa daerah penelitian terdiri dari 3 satuan geomorfologi, yaitu dataran - landaian fluvial, satuan perbukitan berlereng curam - sangat curam, dan satuan perbukitan struktural berlereng miring - agak curam. Berdasarkan aspek batuan dan kualitasnya, daerah penelitian terdiri dari 5 satuan geologi teknik yaitu satuan perselingan batupasir tufan karbonatan dan batulempung tufan karbonatan lapuk rendah memiliki kualitas baik (*good rock*), satuan perselingan batupasir tufan karbonatan dan batulempung tufan karbonatan lapuk sedang memiliki kualitas sedang (*fair rock*), satuan perselingan batupasir tufan karbonatan dan batulempung tufan karbonatan lapuk tinggi memiliki kualitas buruk (*poor rock*), satuan perselingan batupasir tufan karbonatan dan batulempung tufan karbonatan lapuk total memiliki kualitas sangat buruk (*very poor rock*), serta satuan endapan pasir kerakalan *easy digging*. Berdasarkan aspek struktur geologi, terdapat kekar gerus, kekar tarik, sesar turun, sesar geser dekstral STA 8, sesar geser dekstral STA 14, sesar geser sinistral STA 20 LP 1, sesar geser sinistral diperkirakan, dan sesar naik STA 4. Kondisi airtanah (hidrogeologi) memiliki kedalaman muka air tanah yang cukup dangkal dan terdapat dua sumber air yaitu air permukaan (sungai Air Alas) dan air tanah.

Karakteristik geologi teknik permukaan berpengaruh terhadap konstruksi terowongan, yaitu aspek morfologi daerah penelitian berpotensi terjadinya gerakan massa rayapan dan *landslide*, struktur geologi menurunkan kualitas massa batuan, hidrogeologi mempercepat pelapukan dan penurunan kualitas massa batuan. Kualitas massa batuan bawah permukaan cenderung lebih baik dibandingkan kualitas massa batuan permukaan, dimana kualitas massa batuan bawah permukaan didominasi oleh batuan *fair* (sedang), sedangkan kualitas massa batuan permukaan didominasi oleh batuan *poor* (buruk).

Kata kunci: Terowongan jaringan irigasi, karakteristik geologi teknik, kualitas massa batuan, *Geological Strength Index*.

ABSTRACT

Ministry of Public Works and Public Housing (PUPR) plan to build a tunnel construction of irrigation networks in Air Alas irrigation area, Seluma Regency, Bengkulu Province. Detail geotechnic conditions of the area is still unknown, therefore this study was conducted to determine geotechnics properties the planned location of the irrigation network tunnel, it also to determine the quality of the rock mass below the surface along the planned path of the tunnel construction. Data used for determining geotechnics properties, reviewed from several aspects, including geomorphology, rock and soil aspects, geological structure aspects and groundwater conditions (hydrogeology). Methods used in this research including geological mapping technique using 1:5000 scale and Geological Strength Index method to determine the rock mass quality of surface and subsurface area.

The results showed that the study area consisted of three geomorphological units, i.e. flat – gently slope fluvial unit, steep – very steep structural hills unit, and sloping – moderately steep structural hills unit. Based on the aspects of rock and soil quality, the study area consisted of 5 geotechnics units, i.e. interbedded calcareous tuffaceous sandstones with calcareous tuffaceous mudstone slightly weathered that has good quality (good rock), interbedded calcareous tuffaceous sandstones with calcareous tuffaceous mudstone moderately weathered that has intermediete quality (fair rock), interbedded calcareous tuffaceous sandstones with calcareous tuffaceous mudstone highly weathered that has poor quality (poor rock), interbedded calcareous tuffaceous sandstones with calcareous tuffaceous mudstone completely weathered that has very poor quality (very poor rock), and a unit of pebbly sand easy digging deposits. Based on the structural aspects, study area consist of shear joints, tension joints, normal fault, dextral shear fault, sinistral shear fault, estimated sinistral shear fault, and thrust fault. The condition of groundwater (hydrogeology) has a quite shallow water table level and there are two water sources in study area, they are surface water (Air Alas river) and groundwater.

Surface engineering geological properties influence the tunnel construction, i.e. the morphological aspects of the research areas has a potential occurrence of creep and landslide mass movement, geological structure degrade the quality of rock mass, hydrogeology aspect can accelerate weathering and degradation of the rock mass. Subsurface rock mass quality tends to be better than the quality of the surface rock mass, where the quality of subsurface rock mass is dominated by fair rock, while the quality of the surface rock mass is dominated by poor rock.

Keywords: *Irrigation tunnel, engineering geological properties, rock mass quality, Geological Strength Index.*