SARI

Daerah Sei Bingei berada di lereng sebelah selatan kompleks pegunungan Sibayak. Daerah ini memiliki potensi air tanah yang melimpah. Sebagian besar masyarakat memanfaatkan air tanah untuk kebutuhan sehari-hari baik melalui mata air, sumur gali ataupun sumur bor. Kondisi ini menimbulkan pertanyaan dasar, bagaimana karakteristik hidrogeokimia dan hidroisotop air tanah di Sei Bingei? Apakah air dari mata air, sumur gali, dan sumur bor berasal dari sumber yang sama? Berdasarkan permasalahan tersebut, maka tujuan penelitian ini adalah untuk menentukan karkateristik hidrogeokimia dan hidroisotop, menentukan daerah imbuhan air tanah dan menentukan konektivitas hidrolika air tanah di daerah Sei Bingei. Metode penelitian dibagi menjadi tiga tahap yaitu observasi hidrogeologi dan pengambilan sampel air serta analisis kandungan kimia dan isotop di laboratorium. Karakteristik hidrogeokimia daerah Sei Bingei berdasarkan metode klasifikasi Kurlov dibagi menjadi 3 tipe yaitu Kalsium Bikarbonat, Kalsium Alkali Bikarbonat, dan Alkali Kalsium Bikarbonat. Sedangkan tipe air tanah menurut metode diagram Trilinier Piper dapat dibagi menjadi 3 tipe yaitu tipe *Alkaline earth-water, predominantly hydrogen carbonate,* tipe *Alkaline earth-water with higher alkaline content, predominantly hydrogen carbonate,* dan tipe *Alkaline water, predominantly hydrogen carbonate*. Karakteristik hidroisotop daerah Sei Bingei dibagi menjadi 3 kelompok yaitu kelompok air tanah-A (kelompok air tanah yang memiliki rasio isotop mirip dengan rasio isotop air hujan), kelompok air tanah-B (kelompok air tanah dengan rentang rasio isotop $\delta^{18}O$ = ─7,71‰ sd. ─7,64‰; dan rasio isotop δD = ─45,95‰ sd. ─45,21‰), kelompok air tanah-C (kelompok air tanah dengan rentang rasio isotop $\delta^{18}O$ = ─8,25‰ dan ─7,92‰; dan rasio isotop δD = ─50,99‰ sd. ─48,55‰). Daerah imbuhan air tanah bagi sumur bor Sei Bingei berasal dari ketinggian dengan rentang elevasi 1225 mdpl hingga 1445 mdpl. Konektivitas hidrolika air tanah pada sumur bor Sei Bingei memiliki kesamaan dengan air tanah yang ada pada mata air dan sumur gali.

Kata Kunci: **Sei Bingei, Hidrogeokimia, Hidroisotop.**

ABSTRACT

Sei Bingei area located in the southern slope of the Sibayak mountain complex. This area holds abundant groundwater potential. Most inhabitants in this area rely upon groundwater for their daily needs, which sourced from springs, dug-well or bor-well. This condition generates basic questions, what are the hydro-geochemistry and hydro-isotope characteristics of groundwater in Sei Bingei? Is the water from the springs, dug wells, and bore wells come from the same origin? Based on this problem, this research aims to determine the characteristics of hydro-geochemistry and hydro-isotope as well as the location of the groundwater recharge area, and the connectivity of groundwater hydraulics in Sei Bingei. This research was conducted in three stages, hydrogeological observation, water sampling, and analysis of chemical and isotope contents in the laboratory. Based on Kurlov's classification, hydrogeochemical characteristics of Sei Bingei are divided into 3 types i.e., Calcium Bicarbonate, Calcium Alkali Bicarbonate, and Alkali Calcium Bicarbonate. According to the Trilinear Piper diagram, the groundwater is divided into 3 types i.e., Alkaline earth-water, predominantly hydrogen carbonate; Alkaline earth-water with higher alkaline content, predominantly hydrogen carbonate; and Alkaline water, predominantly hydrogen carbonate. The hydro-isotope characteristics of Sei Bingei area are divided into 3 groups i.e., Group-A (groundwater which has an isotope ratio similar to the rainwater's isotope ratio), Group-B (groundwater with isotope ratios ranging from $\delta^{18}O$ = ─7,71‰ up to ─7,64‰; δD = ─45,95‰ up to ─45,21‰), and Group-C (groundwater with isotope ratios ranging from $\delta^{18}O$ = ─8,25 ‰ up to ─7,92 ‰; δD = ─50.99 ‰ up to ─48,55 ‰). Groundwater recharge area for bore-wells in Sei Bingei indicates an elevation ranging from 1225 masl to 1445 masl. Whereas, groundwater hydraulic connectivity at Sei Bingei's bore-wells has similarities with groundwater that exists at springs and dug-well.

Keywords: **Sei Bingei, Hydrogeo-chemistry, Hydro-isotope.**