

Reservoir Guwo PDAB memiliki lima *oftaker* yang langsung didistribusikan ke reservoir PDAM, yaitu Sambikerep, Kreet, Metes, Kaliberot, dan Guwo (PDAM). Kapasitas distribusi pada sistem ini masih terdapat kelebihan kapasitas, sehingga diperlukan pengembangan jaringan distribusi air. Penelitian ini bertujuan menghitung kebutuhan air bersih di Kelurahan Argorejo, Kelurahan Argodadi, Kelurahan Argomulyo, Kelurahan Bangunjiwo, Kelurahan Sedangsari, Kelurahan Guwosari, dan Kelurahan Triwidadi hingga tahun 2040 serta merancang simulasi pengembangan jaringan distribusi menggunakan perangkat lunak EPANET 2.2.

Berdasarkan tujuan tersebut, dilakukan analisis proyeksi jumlah penduduk serta perhitungan kebutuhan air bersih di setiap kelurahan wilayah studi. Hasil perhitungan tersebut kemudian menjadi dasar dalam simulasi pengembangan jaringan distribusi air menggunakan perangkat lunak EPANET 2.2. Proyeksi pertumbuhan penduduk dengan 4 metode perhitungan yaitu aritmetika, geometrik, eksponensial, dan *least square* dari data agregat kependudukan DISDUKCAPIL Bantul. Kebutuhan air wilayah pengembangan dihitung dari kebutuhan domestik, kebutuhan non-domestik, kehilangan air, debit harian maksimum, dan pemakaian air jam puncak. Dari hasil *running* EPANET 2.2 eksisting, nilai tekanan dikalibrasikan dengan nilai manometer lapangan. Dari hasil eksisting akan dikembangkan ke daerah-daerah pemukiman dengan simulasi EPANET 2.2 yang tekanan dan kecepatan disesuaikan kriteria desain pipa distribusi menurut PUPR nomor 27 tahun 2016.

Proyeksi jumlah penduduk disesuaikan dengan hasil standar deviasi terkecil dan nilai korelasi mendekati 1. Dengan hasil kebutuhan air Kelurahan Argodadi sebesar 15,34 liter/detik, Kelurahan Argorejo sebesar 17,51 liter/detik, Kelurahan Argomulyo sebesar 22,97 liter/detik, Kelurahan Triwidadi sebesar 14,82 liter/detik, Kelurahan Bangunjiwo sebesar 49,92 liter/detik, Kelurahan Guwosari sebesar 18,16 liter/detik, dan Kelurahan Sedangsari sebesar 35,92 liter/detik. Dengan total seluruh kebutuhan air 174,7 liter/detik. pengembangan dan didapat bahwa diperlukan tanki di daerah perum Guwosari blok 8, perum Guwosari blok 9, Griya Mahkota Intan, dan Desa Sedangsari. Peningkatan diameter dibeberapa jalur yaitu, JU.Reservoir Metes ke Desa Argodadi sebesar 200 mm, JU.Reservoir Kreet ke Desa Guwosari, Desa Sedangsari, dan Perum Kasongan Permai sebesar 200 mm. Serta untuk Jaringan Pembawa (JP) ada JP.Reservoir ke Kreet Perum Kasongan Permai sebesar 100 mm, JP.Reservoir ke Kreet ke Desa Sedangsari sebesar 150 mm, JP.Reservoir ke Kreet ke Desa Guwosari sebesar 150 mm. Pemasangan pompa di Perum Guwosari 9 dengan *flow* 0,74 Liter/detik dan *Head* 10 m, Perum Guwosari 8 dengan *flow* 0,74 Liter/detik dan *Head* 5 m, dan Perum Kaliasem dengan *flow* 0,837 Liter/detik dan *Head* 24 m. Disarankan agar PDAB melakukan pengumpulan data kebutuhan non-domestik secara lebih lengkap, mempersiapkan pengembangan jaringan distribusi ke arah utara dan selatan, serta menyediakan lahan untuk peningkatan kapasitas reservoir.

Kata Kunci: Air bersih, PDAB, Kebutuhan air, Distribusi air, EPANET 2.2

ABSTRACT

The Guwo PDAB reservoir have five *offtaker* reservoirs that are directly distributed to PDAM reservoirs, namely Sambikerep, Kreet, Metes, Kaliberot, and Guwo (PDAM). The distribution capacity in this system is not optimal according to the criteria, so it is necessary to develop a water distribution network. This study aims to calculate the need for clean water in Argorejo Village, Argodadi Village, Argomulyo Village, Bangunjiwo Village, Sedangsari Village, Guwosari Village, and Triwidadi Village until 2040 and design a distribution network development simulation using EPANET 2.2 software.

Based on these objectives, an analysis of the projected population and the calculation of clean water needs in each village in the study area were carried out. The results of these calculations then became the basis for the simulation of the development of a water distribution network using EPANET 2.2 software. Population growth projections with 4 calculation methods, namely arithmetic, geometric, exponential, and *least square* from the aggregate population data of DISDUKCAPIL Bantul. The water needs of the development area are calculated from domestic needs, non-domestic needs, water loss, maximum daily discharge, and peak hours water usage. From the results *of the* existing EPANET 2.2 running, the pressure value is calibrated with the field manometer value. From the existing results, it will be developed to residential areas with an EPANET 2.2 simulation whose pressure and speed are adjusted to the distribution pipeline design criteria according to PUPR number 27 of 2016.

The population projection was adjusted to the result of the smallest standard deviation and the correlation value was close to 1. With the results of Argodadi Village's water needs of 15.34 liters/second, Argorejo Village of 17.51 liters/second, Argomulyo Village of 22.97 liters/second, Triwidadi Village of 14.82 liters/second, Bangunjiwo Village of 49.92 liters/second, Guwosari Village of 18.16 liters/second, and Sedangsari Village of 35.92 liters/second. With a total water requirement of 174.7 liters/second. development and it was obtained that tanks are needed in the areas of Perum Guwosari block 8, Perum Guwosari block 9, Griya Mahkota Intan, and Sedangsari Village. An increase in diameter in several lines, namely, JU. Metes Reservoir to Argodadi Village of 200 mm, JU. The Kreet Reservoir to Guwosari Village, Sedangsari Village, and Perum Kasongan Permai is 200 mm. And for the Carrier Network (JP) there is JP. Reservoir to Kreet Perum Kasongan Permai of 100 mm, JP. Reservoir to Kreet to Sedangsari Village of 150 mm, JP. The reservoir to Kreet to Guwosari Village is 150 mm. Installation of pumps at Perum Guwosari 9 with *a flow* of 0.74 Liters/second and *a Head* of 10 m, Perum Guwosari 8 with *a flow* of 0.74 Liters/second and *a Head* of 5 m, and Perum Kaliasem with *a flow* of 0.837 Liters/second and *a Head* of 24 m. It is suggested that PDAB collect data on non-domestic needs more completely, prepare for the development of distribution networks to the north and south, and provide land for reservoir capacity increases.

Keywords: clean water, PDAB, Water needs, Water distribution, EPANET 2.2