

INTISARI

Tanjung Selor, Ibu Kota Provinsi Kalimantan Utara, masih berstatus sebagai kecamatan di Kabupaten Bulungan hingga saat ini, Mei 2025. Potensi pemekaran wilayah Tanjung Selor menjadi Daerah Otonom Baru (DOB) berdampak terhadap kebutuhan infrastruktur dasar, salah satunya sistem penyediaan air baku. SPAM eksisting mencakup Kecamatan Tanjung Selor dan Kecamatan Tanjung Palas, namun pelaksanaannya mengalami beberapa permasalahan teknis seperti ketidaksesuaian jenis pompa, dimensi pipa yang tidak mencukupi, kerusakan pipa layanan, dan tekanan air di area layanan yang tidak memenuhi standar. Di wilayah Gunung Seriang, Bumi Rahayu, dan Apung, jaringan eksisting telah tersedia, namun pemanfaatannya masih terbatas. Oleh karena itu, dilakukan evaluasi kinerja rencana SPAM Tanjung Selor di wilayah tersebut.

Evaluasi SPAM dilakukan menggunakan bantuan *software* EPANET 2.2 dengan *demand driven approach* (DDA) yang berfokus pada pemenuhan kriteria rencana jaringan sistem penyediaan air baku di unit transmisi dan unit distribusi sesuai dengan Peraturan Menteri PUPR No. 27/PRT/M/2016. Analisis kebutuhan pompa *booster* pipa transmisi eksisting dilakukan di setiap zona distribusi serta dilakukan pemantauan tekanan di titik pelayanan dan kecepatan air dalam pipa sepanjang area layanan.

Hasil evaluasi menunjukkan tekanan negatif terjadi di *node* LayananApung2 di zona distribusi Apung dan empat *node* dari lima *node* di zona distribusi Kota Baru Mandiri. Tekanan negatif di zona distribusi Kota Baru Mandiri disebabkan perbedaan elevasi reservoir dan area layanan yang cukup tinggi. Tekanan dibawah standar terjadi di *node* LayananBR4 dan LayananBR5. Selain itu, kecepatan dibawah standar ditemukan di pipa transmisi Bumi Rahayu. Kecepatan aliran dalam pipa di zona distribusi Kota Baru Mandiri seluruhnya telah memenuhi kriteria. Rekomendasi perubahan elevasi reservoir dan dimensi pipa layanan diberikan di area yang mengalami tekanan dan kecepatan di bawah standar. Sedangkan, rekomendasi penambahan pompa diberikan di *node* zona distribusi Kota Baru Mandiri. Rekomendasi yang diberikan dapat memastikan jaringan distribusi dialirkan secara gravitasi, kecuali di *node* area LayananKBM5.

Kata kunci: SPAM Tanjung Selor, zona distribusi, EPANET 2.2, evaluasi, rekomendasi.

ABSTRACT

Tanjung Selor, the capital of North Kalimantan Province, is still classified as a sub-district in Bulungan Regency as of now, May 2025. The potential expansion of the Tanjung Selor area impacts the need for basic infrastructure, one of which is the raw water supply system. The existing Water distribution system covers the Tanjung Selor District and Tanjung Palas District, but its implementation faces several technical issues such as pump type incompatibility, insufficient pipe dimensions, service pipe damage, and water pressure in the service area that is below standard. In the areas of Gunung Seriang, Bumi Rahayu, and Apung, the existing network is available, but its utilization is still limited. Therefore, an evaluation of the performance of the Tanjung Selor SPAM plan was conducted in the area.

Water distribution system evaluation is conducted using the EPANET 2.2 software with a demand-driven approach (DDA) that focuses on meeting the criteria for the raw water supply system network plan in the transmission and distribution units in accordance with Minister of Public Works and Public Housing Regulation No. 27/PRT/M/2016. The booster pump requirements for the existing transmission pipes were analyzed in each distribution zone, and pressure monitoring was carried out at service area.

The evaluation results show that negative pressure occurs at node LayananApung2 in Apung distribution zone and at four out of five nodes in the Kota Baru Mandiri distribution zone. The negative pressure in Kota Baru Mandiri distribution zone is caused by a significant difference in elevation between the reservoir and the service area. Below-standard pressure occurs at node LayananBR4 and LayananBR5 node. Additionally, below-standard velocity is found in Bumi Rahayu transmission pipe. The flow velocity in the pipes in Kota Baru Mandiri distribution zone has fully met the criteria. Recommendations for changing reservoir elevation and service pipes dimensions are given for pipes experiencing underpressure and velocity below standard. Meanwhile, recommendations to add pumps is given at node of Kota Baru Mandiri distribution zone. These recommendations can ensure that the distribution network can be supplied by gravity, except at node LayananKBM5.

Keywords: *Tanjung Selor water supply system, distribution zone, EPANET 2.2, evaluation, recommendation.*