

4. Proposed Framework

The system boundary in the conceptual model of this study is shown in Figure 3. There are four main systems, namely raw water pumping station, solid system clarifier, filter tank, and filtered water reservoir. The desired inputs are raw waters quality and quantity, electrical energy demand, and the amount of chemical feeding. The expected outputs are water supply quality and quantity. The electrical energy is used in the raw water pumping system and the transferred water to the treatment system. The blower pump and wash water pump are used to support the filter system. Finally, the filtered water is transferred to the reservoir before sending to the transmission system and the distribution system. Moreover, the chemical feeding is also important in the water treatment system. Lime, coagulant, chlorine, and alum are fed between the raw water pumping station and solid clarification. They are also fed in the reservoir to disinfect and equalize the water. The water treatment reveals the interrelationship between water and energy, and it should be considered in WEN scheme to improve the performance of this system.

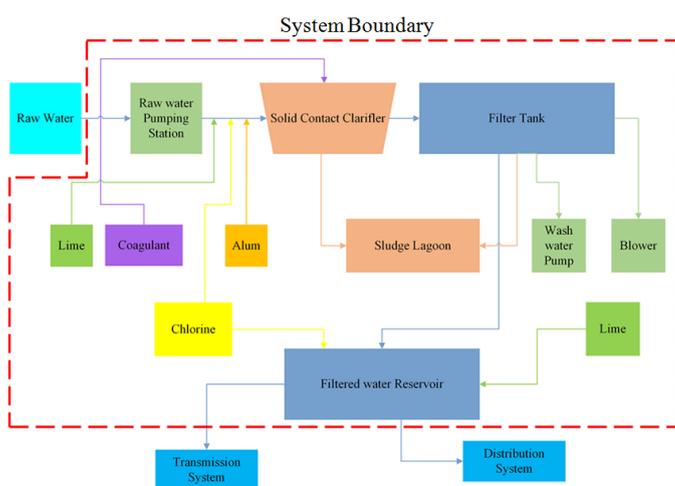


Figure 3. Proposed conceptual model of the WEN in water treatment system

5. Towards Implementation of the Proposed Framework and Conclusion

The proposed framework is considered the terms of input parameters and outputs. This framework can be analyzed by means of the Input-Output analysis approach. The proposed framework will be studied and evaluated the water supply treatment system using a case study in Bangkok. The energy performance, economic performance, and weakness of the system in the context of WEN will be evaluated. It is expected that findings from this work would contribute to improve the water treatment system. The study will focus on scenarios simulation and compare the effectiveness of different cases. The performance of the system will be simulated in various cases, namely BAU, limited budget, and modified system. In addition, the work will be made an attempt to compare the performances of different cases. Finally, it is expected that the proposed WEN framework would provide solutions to effectively improve the water treatment system.

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