

Accepted Manuscript

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PII: S0959-6526(18)32182-6

DOI: [10.1016/j.jclepro.2018.07.193](https://doi.org/10.1016/j.jclepro.2018.07.193)

Reference: JCLP 13647

To appear in: *Journal of Cleaner Production*

Received Date: 10 January 2018

Revised Date: 12 July 2018

Accepted Date: 18 July 2018

Please cite this article as: Fadzil AFA, Wan Alwi SR, Manan ZA, Klemeš JiříJaromí, Industrial site water minimisation via one-way centralised water reuse header, *Journal of Cleaner Production* (2018), doi: 10.1016/j.jclepro.2018.07.193.

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Industrial Site Water Minimisation via One-Way Centralised Water Reuse Header

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ABSTRACT

Water is extensively used in industry for processes such as washing, stripping, extraction, heating and cooling. Growing world population, rising price of freshwater and stricter environmental regulations have motivated efforts for efficient water management and utilisation in industry. Even though research on Water Integration at Total Site have been well-documented, there are still a few critical issues that need to be adequately addressed. Complex water exchange networks that have typically resulted from superstructure optimisation at Total Site can be costly and less favourable for practical implementation. In this paper, the concept of one-way centralised water reuse header (CWRH) is applied for Water Integration at Total Site for a simpler and easy-to-manage inter-plant water reuse and exchange. Process plants are assumed located along the centralised water reuse header, and water is exchanged along the one-way pipeline. The CWRH system can be operated by a third-party, allowing the operator to protect users' proprietary information and confidential data. Total Site Centralised Water Integration (TS-CWI) is developed to target the minimum freshwater requirement and wastewater generation across Total Site. The methodology is illustrated using a case study comprising of

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