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Young's bargaining model for optimal design of groundwater *in-situ* bioremediation

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Optimization problem with groundwater quality issues can be considered with different objective functions. These objectives cause conflicts between different stakeholders that have conflicting goals. Young's bargaining model is one of the game theories that can be used to find the best design from a set of optimal solutions. In this paper, the optimal *in-situ* bioremediation design for contaminated groundwater with dissolved hydrocarbon is obtained by minimizing the total cost and the square of cleanup standard violation (SCSV). After the optimal solutions were extracted by applying the non-dominated sorting genetic algorithm (NSGA) II, Young's bargaining model was used to select the best alternative. Results show that the selected solution by Young's model is the most optimal combination of two objective functions considered in this study. This solution decreases the cost of project as much as 78.85%. This cost reduction will increase the violation of cleanup standard as much as 25.86%.

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Notes:

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