

Arsenic Removal from OU Water

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Executive Summary

In 2000, the EPA mandated that the arsenic level for water distribution systems must be reduced to 10 ppb (parts per billion) by the year 2006. **The results of our Senior Capstone Project show how the University of Oklahoma can save several million dollars over a long term horizon, by using treatment methods, and only purchasing water from the City of Norman occasionally at peak demands.** In order to comply with the new regulation, our project recommends the construction of an Ion Exchange (IX) treatment facility as opposed to water purchase from the City of Norman.

The Net Present Cost (NPC) of purchasing water for the next 20 years, that is the total cost at 2003 dollars, is estimated to be approximately \$8,000,000 at the current water price of \$1.14/1000gals. In comparison, the NPC of building a treatment facility and treating the water for Arsenic has only a Net Present Cost of approximately \$3,000,000, for the same project lifetime. In fact, in order for the Water Purchase (WP) option to become more economically attractive than treatment, the water price charged by the City of Norman would have to be lower than \$0.45/1000gals. A price so low could not be offered by the City, since it costs Norman roughly \$0.60/1000 gals to produce it.

Assuming that the University of Oklahoma borrows money to sponsor the project, the money saved in the first year alone by building an IX treatment facility instead of purchasing water would amount to \$150,000. Furthermore, the savings would increase until the loan is paid off and would roughly double after the first ten years, when no more payments are made. While the initial capital investment required for the Ion Exchange facility is substantial, the savings made by implementation of treatment versus water purchase begin in the first year of the project and greatly outweigh the inconvenience of borrowing money.

In addition to the substantial economic benefits provided by treatment, construction of a treatment facility would allow the University of Oklahoma to remain independent from the City of Norman, as Norman faces water shortages of its own; and may be forced to purchase water on an emergency basis from Oklahoma City.

Conclusion: *Over a twenty-year period, the total savings provided by the construction of a treatment facility will be in excess of 4.8 million dollars. At the current commercial price of \$1.14 per 1000 gallons, the yearly cost of water purchase will be near \$500,000, and will increase with the water demand of the University.*