Battlefield Golf Club Water Project
Water Supply Feasibility Study

The following is a brief summary of the findings of the City's consultant, URS Corporation. The complete report is posted on the project web site and is available for review. A printed copy is also available at the Chesapeake Central Library.

Due to concerns regarding potential impacts to groundwater quality from the use of fly ash as fill at the Battlefield Golf Club, the City of Chesapeake initiated a water supply feasibility study to evaluate existing conditions and assess viable alternatives capable of delivering potable water to City residents located within the study area. For the purposes of this study, this review involved the properties on both sides of those segments of Centerville Turnpike, Murray Drive and Whittamore Road that surround the Battlefield Golf Club.

The following four alternatives were evaluated:

- **Alternative 1:** Extend the City of Chesapeake's central water distribution system via water main extensions.
- **Alternative 2:** Install a "stand alone" community groundwater supply, treatment, storage and distribution system capable of serving the study area.
- **Alternative 3:** Install point-of-entry (POE) treatment systems on existing wells.
- **Alternative 4**: Install and develop new private homeowner wells.

The Water Supply Feasibility Study evaluated the alternatives based on regulatory compliance, property owner inconvenience, operational requirements, technical feasibility, administrative/permitting concerns, and present worth cost (capital and operations and maintenance (O & M) costs. State and Federal Water Quality Regulations also were used to determine if various water quality elements were within regulatory limits for drinking water standards.

Evaluations

Cost analyses and Alternatives Evaluation Decision Matrix evaluations were used to compare the alternatives. Costs include all capital and operation and maintenance (O&M) costs. In a present worth comparison of alternatives, the costs associated with each alternative are all converted to a present sum of money, and the least of these values represents the best financial alternative. As summary of the present worth analysis is:

Summary of Findings and Recommendations

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Capital Cost	$7,221,756	$8,2411,704	$2,770,149	$803,000
Useful Life	30 Years	30 Years	30 Years	30 Years
O & M costs				
• City	$3,000/yr	$187,227/yr	$460,879/yr	$0/yr
• Homeowners	$0/yr	$0/yr	$166,923/yr	$10,000/yr
Present Worth	$7,267,873	$11,289,844	$9,854,989	$956,725

Note that O&M costs for residents are also provided, which do not include water bills from the City for alternatives 1, 2 and 3)

While a present worth analysis is invaluable in evaluating alternatives it should not be the only consideration. In this study an Alternatives Evaluation Decision Matrix also was developed which considered six categories of criteria to further assess the alternatives. The six categories are as follows:

1. Regulatory Compliance – Water Quality
2. Property Owner Impact
3. Operational Requirements
4. Technical Feasibility
5. Present Worth
6. Permitting / Administrative Burdens

Each category was further sub-divided into the specific criteria indicated and given a relative weight of importance on a scale of 0 - 10 (no importance rated 0, most important rated 10). The amount of "relative importance" is a comparison between the respective criteria. The higher the value, the more favorable the alternative. A summary of the Alternatives Evaluation Decision Matrix is as follows:

Alternative	Score
Alternative 1: Extend the City of Chesapeake's central water distribution system via water main extensions.	412
Alternative 2: Install a "stand alone" community groundwater supply, treatment, storage and distribution system capable of serving the study area.	210
Alternative 3: Install point-of-entry (POE) treatment systems on existing wells.	216
Alternative 4: Install and develop new wells into aquifer(s) offering potentially less susceptibility to reduced water quality conditions and potential contaminants from the fly ash.	366

The results of the decision matrix evaluation show Alternative 1 as the most feasible.

Summary of Findings and Recommendations

Recommendation

Based on the investigations of the alternatives evaluated to supply potable water to the homes in the vicinity of the Battlefield Golf Course, Alternative 1 was the recommended alternative. The advantages of this alternative in relation to the others are:

- Provides residents access to the highest quality water available,
- Can be implemented relatively quickly,
- Eliminates homeowner operation and maintenance responsibility,
- Offers the highest level of fire protection,
- Protects public welfare,
- Minimizes environmental impacts and would be the most protective against any potential future impacts to the existing aquifer supply.
- Provides a redundant, reliable water supply.