

**Metropolitan Domestic Water Improvement District
Board of Directors Meeting**

September 12, 2011

**Award of Professional Services Agreement with Arcadis (Malcolm Pirnie)
for an Optimization Study Associated with the South Shannon Aeration Treatment System**

Synopsis

The Board of Directors is requested to approve a professional services agreement between Arcadis formerly known as Malcolm Pirnie and the District for completing an optimization study of the treatment system(s) at the South Shannon Facility. The agreement is for a not-to-exceed amount of \$37,000.

Background

The District began monthly monitoring in early 1994 of its supply wells in the Southwest wellfield after traces of two volatile organic compounds (VOCs) were found at the South Shannon well. As a precaution, blending of VOC free water from the Latamore wells with South Shannon well water began in May 1995. At the December 1995 Board meeting, the Board directed staff to find viable water supply options in the South Shannon service area. Malcolm Pirnie, a local environmental engineering consultant, was selected by staff and approved by the Board at their April 8, 1996 meeting.

New state legislation was also passed in 1996 to enhance the State's Superfund clean-up program. The program presently has a budget to foster clean up of groundwater contamination sites, including the Shannon-Rillito WQARF Site. Unfortunately, the program was not fully functional in 1996/1997, so in June 1997 the District expended approximately \$150,000 of its own funds to evaluate, design, and construct a wellhead treatment system. The treatment system utilized low pressure compressed air to strip out VOC's and vent to atmosphere and became operational in July 1997. The treatment system had consistently provided to customers in the South Shannon service area water virtually free of VOCs during its first 5 years of operation. The aeration system was designed for 90% removal, but was demonstrating 95% removal. By 2002 however, the treatment system indicated less removal capability; concurrently, VOC levels at the well were slowly increasing. Subsequently, by 2002, production rates from the well were manually decreased from 750 gallons per minute to 400 gallons per minute.

During the period of aeration treatment, ADEQ completed field work in 2001 on its first phase of remedial investigation work at the District's South Shannon well and two other affected non-District wells. The purpose of the investigation was to complete a detailed subsurface investigation of what zones of the aquifer are contributing to elevated volatile organic compounds (VOCs). Prior to the

beginning of the remedial investigation, ADEQ informed the District it could seek reimbursement for current operational and maintenance (O&M) costs associated with the District's treatment system. In October 2001, the District approved an Interim Remedial Action (IRA) Contract with ADEQ, which outlines how the District can receive reimbursement.

In July 2002, District staff met with ADEQ to discuss concerns regarding the District finding higher VOC concentrations in the South Shannon well water than what the treatment system was designed to handle. Fortunately, the VOC detects were only found in the water after the treatment system and not in the reservoir supply delivered to the South Shannon area customers (One exception occurred in April 2004, where the MCL was exceeded for PCE).

A feasibility study by Malcolm Pirnie was approved by the Board in 2003 to determine enhancements that would best suit the District's further treatment needs. The enhanced treatment would also need to satisfy ADEQ's requirements as well. A final treatment design for Granular Activated Carbon (GAC) treatment was approved and implemented in 2005. The GAC treatment system was commissioned to service in June 2006, and has been in service since then. In lieu of VOC treatment, South Shannon well was shut down and the reservoir was provided water from other sources.

Since the District had an Interim Remedial Action (IRA) contract in place since 2001, the District was allowed to request payments from ADEQ on authorized new improvements (GAC treatment), plus O&M. The District has greatly benefitted from this program regarding quarterly O&M reimbursements; however, the IRA agreement is a year-by-year exercise, with less annual certainty of the program's continuation.

The following table represents the time-line of the South Shannon VOC challenges since 1994:

| South Shannon VOC / Treatment Timeline | |
|---|----------------|
| Milestone | Date |
| VOCs PCE and TCE Detected in South Shannon Well | 1994 |
| Latamore System Re-routed to Blend with South Shannon | 1995 |
| District Installs Lowry Aeration Treatment System for VOC Removal - Cost ~ \$150,000 - District Funded | 1997 |
| ADEQ Pursues Remedial Investigation to Better Understand Pollution Source - Ongoing | 2000 |
| District Enters into Interim Remedial Action (IRA) Contract with ADEQ - Allows for Reimbursement for Operation and Maintenance (O&M) Expenses | 2001 |
| District Meets with ADEQ to Discuss Elevated VOC's in South Shannon's Well Water | 2002 |
| Feasibility Study on Treatment System to Remove Higher Than Historical VOC's | 2003 |
| VOC's Exceed MCL - Aeration System Not Capable of Removing VOC's - Aeration System Taken Off Line | 2004 |
| Granular Activated Carbon (GAC) Treatment Selected - ADEQ Participates in Total Feasibility Study, Engineering and Capital Funding - Total Cost ~ \$1,000,000. Aeration System Moth-Balled for Potential Future Use | 2004-2006 |
| June 2006 to Date - GAC System In Operation - Two Vessels Configured in Lead/Lag, Capable of Removing 60 Million Gallons Between Change-Outs - To Date District's Reimbursements From ADEQ - ~\$614,000 - 984 Million Gallons Treated, or 3019 Acre Ft. | 2006 - Present |

Issues

District staff is increasingly concerned with the financial stability of ADEQ's reimbursement program. Indeed, District budget allocations have allowed up to \$125,000 per year commitment for GAC treatment in case ADEQ would decide to discontinue funding for South Shannon treatment O&M costs. Typically, four to five GAC change-outs are required annually at a cost of roughly \$25,000 per change-out event.

While the District has benefitted greatly with the IRA over the years, a proactive stance to save future expenditures is required in light of ADEQ shortfalls. Even though the dormant low pressure aeration system is dormant, serious consideration will be needed, pending lack of ADEQ funding. In the event ADEQ funding ends, the intent is to salvage the aeration system and resurrect its use.

During the discussion phase of treatment enhancements and the subsequent decision to utilize GAC treatment, ADEQ heavily influenced this decision due to their preference of GAC and complete elimination of VOC off-gassing; which was the case with the previous treatment. The issue of off-

gassing risk from aeration was not considered by the consultant to be a significant environmental issue, due to the location of the facility in relation to the neighboring houses and the low volume of VOC's removed. Regardless, ADEQ took a conservative position and the District agreed to GAC treatment primarily due to ADEQ significantly funding the GAC treatment and subsequent O&M. If ADEQ was to no longer be a participant, the District could save substantial monies using the aeration system.

The aeration system would be configured to pre-treat the VOC-laden water prior to GAC treatment. As VOC's are mostly removed via aeration, the life span of GAC media would be greatly enhanced. The present estimate is reducing GAC change-outs by half. More complete analysis of GAC life will be required prior to implementing aeration.

Arcadis (Malcolm Pirnie) has been the consultant for South Shannon treatment since the knowledge of impaired well water was known. Staff feels confident in their abilities to allow the District to proactively review its options in relation to VOC removal.

Recommendation

Staff recommends that the Board of Directors approve a professional services agreement with Arcadis for the Optimization Study associated with the South Shannon Aeration Treatment System for a not-to-exceed amount of \$37,000.

Suggested Motion

I move that the District approve the professional services agreement with Arcadis for the Optimization Study associated with the South Shannon Aeration Treatment System for a not-to-exceed amount of \$37,000.

Respectfully submitted,

Christopher W. Hill
Deputy Manager

I concur with staff's recommendation.

Respectfully submitted,

Mark R. Stratton, P.E.
General Manager