DISTRICT OF COLUMBIA
WATER AND SEWER AUTHORITY

Board of Directors

Audit Committee

Thursday, May 26, 2011

5000 Overlook Avenue, SW
Room 407

1. Call to Order	Chairman Timothy Firestine
2. Follow-up items from the prior Committee meeting	Christopher Carew
3. Summary of Internal Audit Activity - Internal Audit Status	Joseph Freiburger
4. Executive Session	Chairman Timothy Firestine
5. Adjournment	Chairman Timothy Firestine

Responses to the Audit Committee
May 19, 2011

PURCHASE CARDS

- Please see the attached presentation.

SECURITY

Explain the short-term plan to address known and obvious deficiencies such as lack of fencing around pump stations.

All major pumping stations are fenced and secured. Several minor pumping stations are designed so that the structure serves as a secure enclosure or vault. Upon completion of the upcoming Vulnerability Assessment and Security Master Plan, it is anticipated that additional fencing will be planned and incorporated accordingly. Some locations have severe restrictions on fencing options, such as Potomac Pumping Station located under the convergence of highway access to I-66 at the Theodore Roosevelt Bridge, where land is owned and controlled by other local authorities. Other obvious deficiencies, such as the lack of camera surveillance technologies, are being addressed in a specific series of upcoming projects funded and scheduled for FY 2011-2012. The first two of these projects are underway and scheduled for completion this summer.

Describe the scope of work for the contract to do a full security assessment; provide estimated timelines for implementation.

The SOW for the full security assessment is to perform an overall physical security risk vulnerability study; benchmark in-place security systems, components, processes and functions; and provide recommended corrective strategies to reduce identified risks based on Homeland Security and Wastewater industry security guidelines and standards. This includes all DC Water property and facilities, both on and off Blue Plains. Contract terms require services to begin within 10 days of receiving a completed Purchase Order (constituting the Start Date) and completion within 90 days of said start date. Current estimates for completion are July 2011.

Explain how we will hold Allied Barton accountable for issues identified in the audit. The lack of drug-testing and background checks was especially distressing to the Chairman.

The Allied Barton contract is now under the management of the Department of Facilities and Security. The designated Contracting Officer's Representative (COR) is now Steve Caldwell, Director, and the Contracting Officer's Technical Representative (COTR) is the Security Manager, currently Bernetta Vaughan (Acting). Utilizing COTR industry standards for inspection review and under the guidance of the COR, the COTR will conduct monthly operational reviews using established formats and agenda items to review all monthly progress reports and activity reports. Spot inspections of personnel records, activity logs, and training records will be conducted during the monthly review. Any deficiencies will be noted and clearly

defined follow-up inspection efforts will be identified to allow for corrective action in a timely manner. Indications of contract non-compliance will be documented and specific cure actions will be mandated with the assistance of Procurement. The COR, with assistance from the COTR and Procurement, will hold quarterly performance reviews with the contractor to identify specific performance issues and to provide an overall quarterly evaluation to the contractor. If the contractor fails to perform at a Satisfactory level for two consecutive quarters, or 3 quarters during the contract year, the COR will exercise the option to re-bid the contract.

Explain who provides security to the Washington Aqueduct and if a report is available for review.

The Washington Aqueduct is fully under the control and authority of the US Army Corp of Engineers (USACE) and, as such, is not under any legal obligation to DC Water. The USACE has a rigorous and aggressive security posture in place, with regular and routine reviews and updates, largely based on the high profile of the community it serves. However, in a cooperative stance, we are working with the Chief of Security, Washington Aqueduct, to meet and brief the Director, Department Facilities and Security (DF/S), DC Water, in order to provide us with some details on what security measures are taken to ensure the potable water supply for Washington DC is safe. The USACE stipulates that specific details of security measures are not to be provided to other DC Water personnel except under the strictest confidentialities. We are in the process of requesting the Washington Aqueduct Chief of Security be available for Board inquiries if possible.

WATER LEAKAGE

What is being measured in the water-loss categories named, "customer metering inaccuracies" and "data handling errors."

Customer Metering Inaccuracies:
Small and large meters' under-registration
AMCO issue with 3" and 4" meters

Data Handling Errors:
Manual meter reads
No billing / customers without an account
Billing adjustments

How does our 25% loss rate compare to WSSC?

WSSC reported losses of 17% to the Maryland Department of the Environment. When measured using AWWA manual guidelines, they have experienced losses of 20%.

CUSTOMER BILLING

Provide a breakdown of the factors contributing to the 3% of estimated bills.

- MTU failed due to battery failure or wiring error
- Blocked MTU transmission
- Delay in updating meter change record
- Actual read that fails high/low validation and is awaiting verification
- Inaccessibility – vacant/closed/unsafe buildings
- Improper service line conditions (jumpers, bypasses)
- Other priorities in department, such as seasonal work for credit and collections, or slow meter testing
- Lower than expected staffing levels, particularly due to unscheduled leave absence

Describe what additional steps we plan to take to reduce the number of estimated bills.

- MTU not responding report – since 2010, IT staff have helped us with reports and systems to monitor MTUs that are not responding. For those that do not respond for more than a week, a service order for MTU repair is automatically generated.
- Increase in MTU inventory – we purchased more MTUs this year to keep in inventory to allow for faster repair/replacement
- Upgrade to newer version of Aclara data collection units, which we believe will provide greater coverage and transmission capabilities
- Increased attention on unscheduled leave and absences – we do weekly reviews of unscheduled leave and counsel employees about attendance.
- Increase in shut off limit to $200 for past due bills – this is partly to make our shut off limit more reflective of higher rates, but also to reduce the number of shut off orders so that meter technicians have more time to maintain meter reading systems and meters.
- Project to get actual reads on chronically hard-to-read accounts. We run a monthly report of accounts with no actual read in more than six months, and use that to do "must read" Fridays, where those accounts are given extra attention to try to get reads.
- Monthly coordination meeting with Engineering to forecast CIP meter needs
- Weekly construction jumper reports – to quickly identify service line replacements that need meter installations
- Increased attention on 14 day notice to repair letters – so customers with improper service line conditions will repair the conditions faster.

Please see the accompanying document, which breaks down the annual percentage of estimated bills.

WMATA

In regard to wastewater flow quantities coming to BPAWTP from WMATA, DETS was able to determine the following WMATA groundwater pumpage (which is a component of all wastewater) from DC Metro underground – i.e., Tunnel – DC Metro stations.

1. In 2005, DC Water requested groundwater pumpage flow information from WMATA. WMATA stated it had 15 facilities in DC discharging a total of 0.69 mgd.

2. In the period 2000-2002, DC Water placed temporary meters on WMATA ground water pumping stations. This was done as part of the effort to quantify groundwater pumpage into the sanitary and combined sewer systems. The estimate from the WASA metering of average flow (gpd) of ground water pumpage from WMATA to BPAWTP is 0.93 mgd.

Note that at best these numbers are rough estimates, based on a short period of measurement, without consideration of factors such as rain during the periods or ground water levels, and with meters of limited accuracy. In other words, they represent an order of magnitude estimate.

CUSTOMER COSTS

Please explain the accounting methodologies used to determine costs for retail ratepayers and wholesale ratepayers.

The CFO will address directly to the committee.

DC WATER
Purchase/Travel Card
Program Overview

Overview

Purchase Card Program

- Pilot program was established in 1999 for purchasing of low dollar value, non-production materials and expense items. The program is intended to simplify the buying process and improve the cycle time from ordering to receipt. The Program is administered by Procurement Department and overseen by OCFO

Travel Card Program

- Program is designed for DC Water employees to travel by reducing the need to carry cash, assist with record keeping, and eliminate the need for travel advances. Travel card can only be used for official travel and travel related expenses. Charges must be settled monthly with statements, receipts, and agreed to travel authorization.

2

Overview

# of Purchase Card Holder

- There are currently seventy (70) cardholders within various DC Water Departments.

Purchase card eligibility

- Approval by Department Head
- Approval by Procurement Director

Cardholder Limits

- Monthly Limits
- Single-use Transactions Limits

3

dc water is life

What are the Benefits of Using a P-Cards?

- Offer the opportunity to streamline the processes of procuring and paying for goods and services
- Reduces the administrative process costs
- Reduces the volume of accounts payable transactions
- Simplifies and automates the purchasing and payment process
- Reduces purchasing cycle time and expedites delivery
- Provides management information
- Allows reallocation of resources to more "mission critical" needs

4

dc water is life

Consider the Benefits of Purchasing Cards

The elimination of process steps results in transaction cost savings

- According to the 2005 Purchasing Card Benchmark Survey*, the average cost of a traditional PO based process was reported by respondents to be about $90
- The average cost of a Purchasing Card transaction was estimated to be about $22

A process cost reduction of $68,000+ for every 1000 transactions migrated to P-Card

*RPMG Research Group

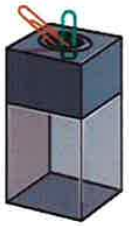
5

dc water is life

Policies and Procedures

Acceptable purchases

- Items that are less than $5,000 and do not require competitive vendor pricing
- Items that are purchased on an emergency basis
- Office Supplies



6

Policies and Procedures

Improper uses of Purchase Card

Purchases that require competitive vendor pricing

- Purchases that are over $100,000
- Purchases that are greater than $5,000 and less than $100,000 should be competed for best pricing by obtaining 3 bids from vendors and selecting best price (Documentation must be submitted monthly that fall under the competitive pricing.)

Splitting orders

- Orders that exceed the cardholder's monthly limits, and/or single-use transaction limits

Purchase Order

- Use of purchase card where an existing contract is in place for the required goods and /or services

7

Policies and Procedures

Compliance failure

- Suspension to permanent revocation of card privileges
- Notification of DCWATER Security for further investigations
- Assignment of wages
- Disciplinary actions which may include reprimand, probation, suspension, demotion or dismissal, and other appropriate legal actions

8

dc water is life

Purchase Card Controls

Existing / Enhanced Controls

Training –

- Prior to issuance of purchase card
- Refresher training on an annual basis

Issuance –

- Completion of Purchasing/Travel Card Request form by Department Head
- Review and approval by Procurement Director
- Cardholder must sign Purchase Card Member Agreement
- Wage setoff for improper use of card added to Purchase Card Member Agreement

9

dc water is life

Purchase Card Controls

Existing / Enhanced Controls

Reconciliation–

- Monthly reconciliation of log of purchases to a Credit Card statement
- Timely submission of reconciliation to Accounts Payable

Review –

- Internal Review Committee
- Periodic review of business needs for cardholders, usage and limits
- Periodic review by OCFO Internal Control Assessment and Monitoring staff

Purchase –

- Automated controls to restrict certain type of purchases

10

dc water is life

Critical Actions Summary

2010 External Audit

- Cited need to strengthen Review and Monitoring Process for P-Cards
- Cited need to make requirements for supporting documentation clear to personnel

2011 Management Actions

- Internal Review Committee established (Procurement/Finance staff)
- Internal Control Assessment - review support documentation of 2011 Purchases
- Dunning policy draft in HR to escalate violations – warn, suspend, revocate
- Increase usage of automated controls to restrict certain types of purchases

11

dc water is life

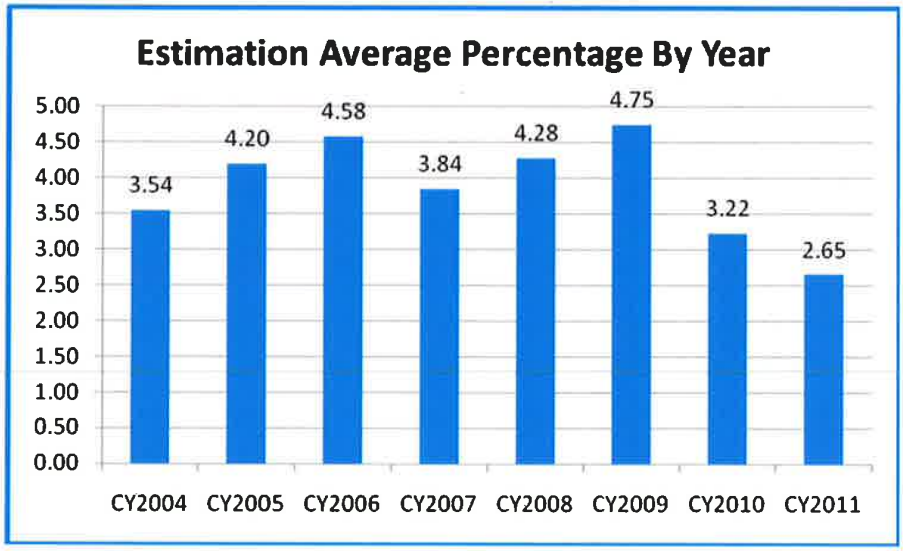
Critical Actions Summary

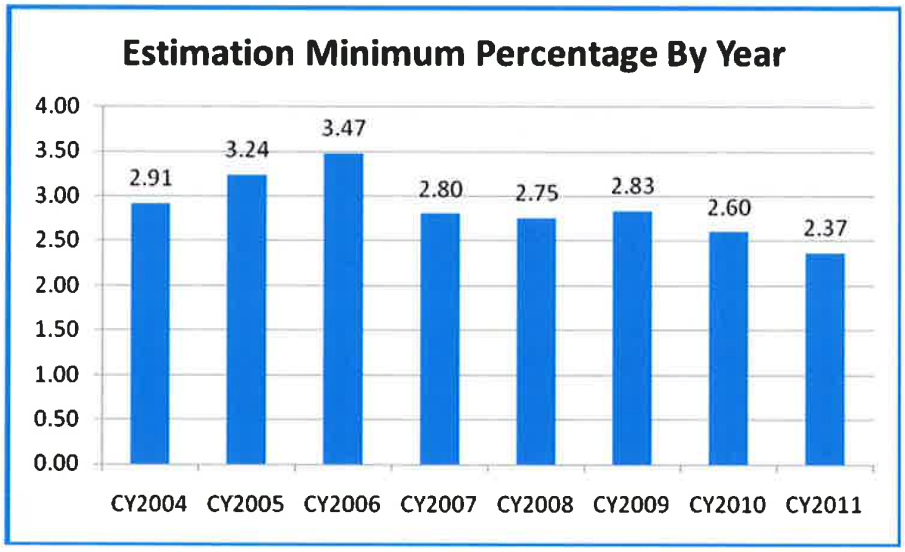
2011 Internal Audit

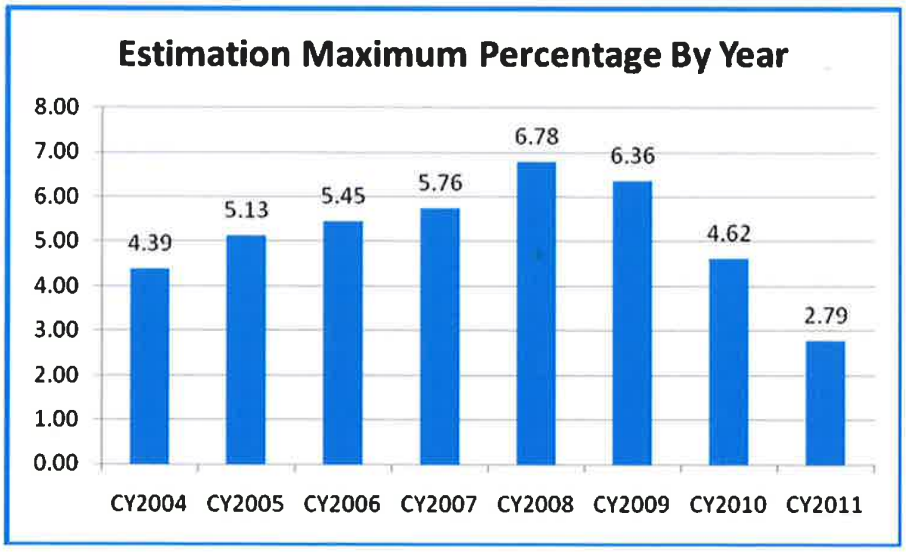
- Entrance conference held with management week of May 9, 2011
- Review of internal controls over issuance, termination, and program management
- Actions recently put into place by management will be reviewed
- Counsel provided for improving controls, processes, procedures
- Research and compare best practices
- Final Report will be distributed to GM, CFO, and Audit Committee

12

Historical Meter Estimation Percentage Analysis By Calendar Year







Internal Audit Update

Audit Committee Meeting

May 26, 2011

The following represents a summary of the activities and achievements since the March 24, 2011 meeting.

I. HIGHLIGHTS:

Performance of scheduled internal audits – Internal Audit performed audit work in six separate audit areas. One of the projects was totally completed and the final report issued. Two of the scheduled audits planned for the year (Fixed Assets, Warehouse & Inventory) were postponed until later at the request of Executive Management and two audits have been substituted (P-Cards, Human Resources).

The one project completed is - Fire Hydrant Maintenance. The four projects in reporting stage are – Fleet Management, Permit Operations, AMR & Customer Billing, and IT-Disaster Recovery & Business Continuity Plans. The one project in planning stage is P-Cards. The chart below depicts the planned projects and their status.

A. **Stage of Audits & Special Projects -** The following represents an indication of the stage of completion for each scheduled audit and requested special project.

PROJECT	PLANNING / SCOPING	FIELDWORK	Draft Report	Final Report
Facility Security & Contingency Planning				
Pumping & Storage Water Leakage Review				
Fixed Assets[1]				
Warehouse & Inventory[1]				
IT – Disaster Recovery & Business Continuity Plans				
Permit Operations				
Grant Operations				
Fire Hydrant Maintenance				
IT – Business & Operating Applications				
Engineering – Contractor Management				

Fleet Management				
AMR & Customer Billing				
IT – Vendor Management & Software Licensing				
P-Cards[2]				
Human Resources[2]				

Note: [1] indicates postponed at the request of Executive Management.
[2] indicates audit added to the plan

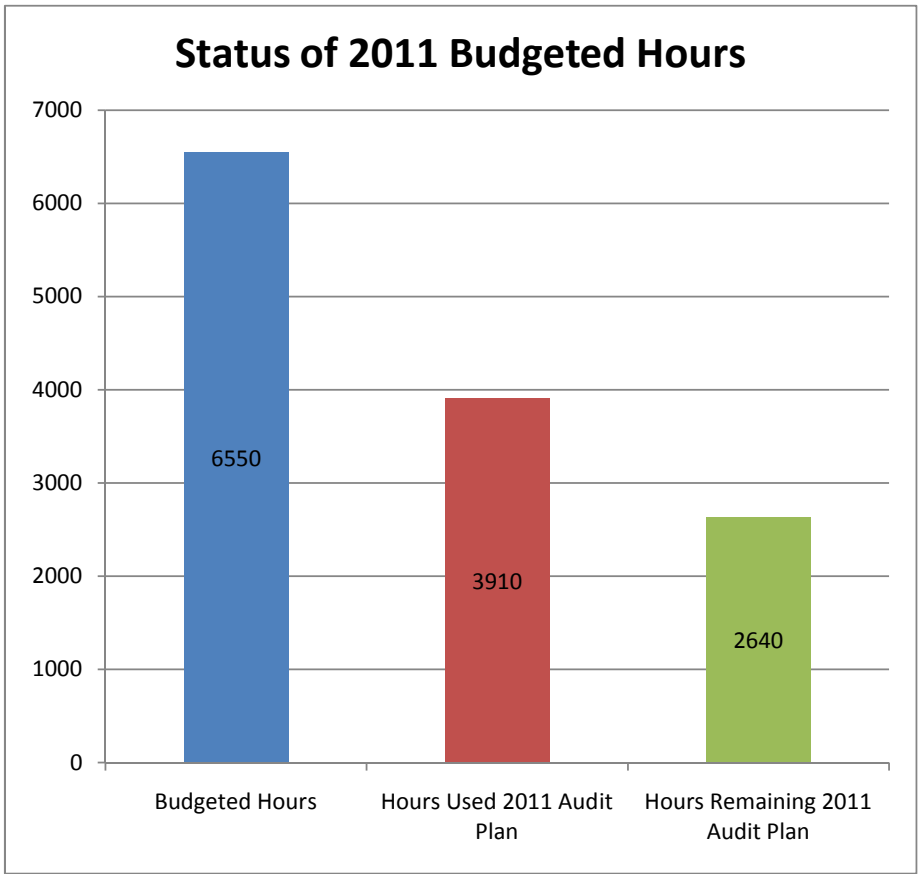
B. **Analysis of key milestone dates -** The following represents an indication of the date of completion of key project milestones.

PROJECT	Start Date	FIELDWORK End Date	Draft Report Issuance Date	Final Report
Facility Security & Contingency Planning	10/8/2010	12/15/2010	12/22/2010	2/18/2010
Pumping & Storage Water Leakage Review	10/27/2010	1/5/2011	1/12/2011	3/1/2010
IT – Disaster Recovery & Business Continuity Plans	2/10/2011	5/10/2011		
Permit Operations	1/20/2011	4/29/2011	5/9/2011	
Fixed Assets[1]				
Warehouse & Inventory[1]				
Grant Operations				
Fire Hydrant Maintenance	1/17/2011	3/29/2011	4/4/2011	5/19/11
IT – Business & Operating Applications				
Engineering – Contractor Management				
Fleet Management	3/24/2011	5/15/2011		
AMR & Customer Billing	4/4/2011	5/13/2011		
IT – Vendor Management & Software Licensing				
P-Cards[2]	5/6/2011			
Human Resources[2]				

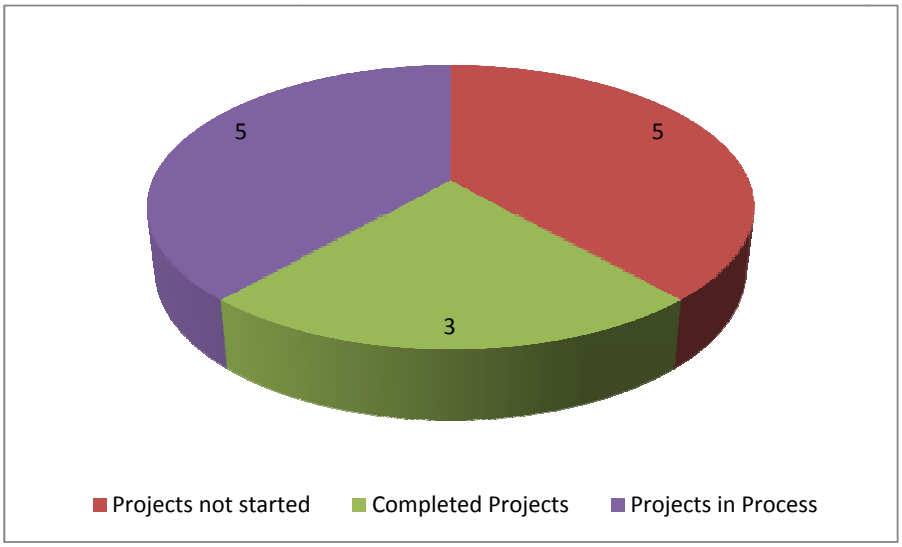
Note: [1] indicates postponed at the request of Executive Management.
[2] indicates audit added to the plan

.

C. **Analysis of Hours –** The chart below indicates the actual hours used through May 15, 2011 toward completion of the internal audit plan, along with an indication of the total hours included in the 2011 plan.



II. 2011 Audit Plan Status



A. Completed Projects Since Last Audit Committee Meeting

Fire Hydrant Maintenance –
Internal Audit established three objectives for its review of the fire hydrant maintenance:

- Confirm that DC Water has a program in place for assuming the fire hydrant inspection role from the DC Fire Department and that the program is in accordance with American Water Works Association (AWWA) recommendations.
- Confirm that DC Water performs regular flow testing in accordance with AWWA recommendations.
- Confirm that DC Water repairs known out-of-service fire hydrants in a reasonable time.

Internal Audit was able to confirm that DC Water has implemented a program to assume the fire hydrant inspection role from the DC Fire Department once the official Memorandum of Understanding has been implemented. Internal Audit reviewed the procedures of the program in detail, covering both the inspections of individual hydrants (which mirror the AWWA's recommended procedures) to the method of assigning hydrants to inspection teams. We also attempted to review the quality assurance process which DC Water currently applies to fire hydrant information received from inspection teams. However, because data artifacts from the process are not stored long term, we were unable to independently verify that the quality assurance function works as designed.

We also reviewed the procedures for flow testing and found them to be in accordance with AWWA guidelines. We did note, however, that only 55% (5,050 hydrants out of 9,144) of DC Water's public fire hydrants have flow test data from within the last ten years (Internal Audit reviewed flow tests using both the AWWA's ten-year flow test standard and DC Water's stricter six-year standard). We noted that the current flow test process has only been in place since 2007. Through discussions with management, we learned the following:

- The flow test process was initially tied to the replacement of several broken or older model fire hydrants to a standard hydrant approved by the National Fire Protection Association (NFPA). As hydrants were replaced, they were also flow tested.

- The fire hydrant replacement program was divided into two phases. The goal of Phase I was to replace approximately 3,500 hydrants to the NFPA-type standard, and this phase was accomplished in full two years ahead of schedule. Phase II is ongoing, and will result in the replacement of all remaining non-NFPA hydrants.

- According to management, because of the cost involved with testing a hydrant which will eventually be replaced by an NFPA-type hydrant anyway, District government urged the Department of Water Services to only test hydrants which already conform to the NFPA-type standard. This accounts for 5,507 of DC Water's 9,144 hydrants (60%). Of these, 4,516 hydrants have been tested (82% of NFPA-type hydrants), and the remainder are due to be tested in the next flow test cycle.

Non-NFPA-type hydrants are occasionally flow tested by DC Water, usually in conjunction with requests from the DC Fire Department, but they are not required to be flow tested per DC Water's policies or procedures. Given the AWWA's recommendation of testing all parts of the distribution at least every 10 years, we suggest that the Department of Water Services confirm that the hydrants which have been tested, at a minimum, account for each portion of the distribution system. We recommend that, long term, DC Water should continue with its goal of standardizing all hydrants to NFPA-type hydrants and flow test each of them at least once every 10 years.

We obtained evidence that the overall number of fire hydrants out of service is low. DC Water maintains a goal of allowing only 1% or less of its hydrants to be out-of-service due to reasons it can control, and we noted that, with some fluctuation, it has maintained this goal. This indicates that DC Water's turnaround time for fire hydrants is at least fast enough to keep pace with new hydrant issues as they appear.

We recommend that in its reporting to the Board of Directors, the Department of Water Services should reference a monthly average of hydrants out-of-service for a given month, as well as a minimum and maximum value of hydrants out-of-service in each month, to allow for an enhanced reporting scheme

B. Audits Currently in Process

Permit Operations - Our overall audit objective is to examine the process used to issue permits including a review for proper authorization, timeliness of processing, and accurate recording of data and fees charged. This project is currently in the reporting stage and will be reported upon at next committee meeting.

IT Disaster Recovery & Business Continuity Plans – This audit is designed to assess the IT disaster recovery (DRP) and business continuity (BCP) plans that are in place for DC Water operations, and to determine whether the plans are adequately tested on a periodic basis to ensure their effectiveness. This project is currently in the reporting stage and will be reported upon at next committee meeting.

AMR & Customer Billing – This audit is designed to evaluate and test the automated meter reading and customer billing processes to validate the effectiveness and efficiency of the process and to verify that customer charges are valid and accurate. This project is currently in the reporting stage and will be reported upon at next committee meeting.

Fleet Management – This audit is designed to evaluate and test the effectiveness of the management of the contracts along with testing of the accuracy of records with respect to fuel purchase and consumption. This project is currently in the reporting stage and will be reported upon at next committee meeting.

P-Cards – This is audit is designed to evaluate the controls over the Purchasing Card process. This audit is currently in the planning stage.

III. Follow Up

In addition to our work performed relative to the audit projects identified in the 2011 Internal Audit Plan, Internal Audit conducted follow-up activity. The table below summarizes the issues by area of responsibility and the current status of the action plan proposed by Management.

	Chief Engineer	AGM Consumer Services	Chief Financial Officer	General Counsel	Chief Information Officer	AGM Support Services	General Manager	Total
New Management Action Plans Since Previous Meeting	-	4	-	-	-	-	-	4
Management Action Plans Implementation Date Not Expired						15		15
Management Action Plans Implementation Date Expired	0	1	0	0	7	8	3	19
Total	0	5	0	0	7	23	3	38

Listed Below is the Originating Audit of the Management Action Plans With Expired Implementation Dates

AGM Consumer Services – Pumping & Storage Water Leakage

AGM Support Services – Safety Programs Training & Compliance, Legal & Regulatory Compliance Monitoring – Regulatory Compliance Review, Procurement

Chief Information Officer – IT – System Development Life Cycle

General Manager – Succession Planning & Training, Legal & Regulatory Compliance Monitoring – Regulatory Compliance Review, Corporate Policies & Procedures

INTERNAL AUDIT OF FIRE HYDRANT MAINTENANCE

May 19, 2011

INTERNAL AUDIT STAFF

Staff Auditor: Perry Eggers
Senior Auditor: John Suire
Audit Manager: Dennis Fitzgerald
Audit Principal: Joseph Freiburger

DC Water Internal Audit of Fire Hydrant Maintenance

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

Background

The primary purpose of a fire hydrant is to supply adequate water to fire fighters to suppress a fire. Fire hydrants are an essential part of the water distribution system. In most municipalities, it is the water utility's responsibility to make sure that all public fire hydrants are in-service and that the local fire department receives information about the status of each fire hydrant in a timely fashion. Any out-of-service hydrant should be promptly replaced or repaired. As of February 25, 2011, the District of Columbia maintained 9,144 individual public fire hydrants. An additional 1,423 private fire hydrants are also located in and around the District, but DC Water does not have responsibility for the maintenance and upkeep of these hydrants.

Prior to 2011, the DC Fire Department was responsible for inspecting the District's public fire hydrants at least once annually. DC Water's responsibility was to repair, replace, or retire any fire hydrants reported as out-of-service or requiring maintenance by the Fire Department. DC Water planned to take on the inspection role from the Fire Department as of March 1, 2011 and is implementing a strategy to achieve coverage of all hydrants. Inspections are multi-step procedures that include a visual inspection of hydrant flow, identification of serious leaks, and checking the condition of paint and flow bands (which indicate to fire fighters what flow they may expect from a given hydrant). The inspections should identify significant damage, such as when a car has damaged a hydrant and rendered it inoperable.

Hydrant inspections are performed by six DC Water crews. These crews are provided with GPS data on each of DC Water's public hydrants, and the crews are assigned to six different areas of the city. Throughout the year, the crews inspect all of the hydrants within their area of responsibility, beginning with hydrants previously identified as having problems. For example, if a citizen sees a hydrant leaking in front of their home, they can call DC Water to report the leak. A work order is created in Maximo, DC Water's system of record, and a fire hydrant inspection crew is notified of the hydrant's status. The inspection team inspects the hydrant and determines if it can be repaired immediately or if it needs more extensive work. As the year goes on, inspection crews will be sure to inspect hydrants that are not reported as faulty, as well, until all hydrants have been inspected for that year.

Beginning in 2007, DC Water also began performing rigorous flow testing on its hydrants. The flow test involves connecting instrumentation to a hydrant (designated as the "residual" hydrant), and then opening the residual hydrant and several other "discharge" hydrants located on the same water main. The change in pressure measured at the residual hydrant is used to calculate the flow which can be expected from the residual hydrant when used to fight fires, taking into account pressure losses from using other hydrants connected to the same network.

Data from inspections and flow tests is entered into DC Water's Maximo system. This data is then pushed to DC Water's and the DC Fire Department's GIS systems.

The Fire Department uses their GIS system and DC Water's information to determine which hydrants are available for fire fighting. A quality assurance process at DC Water ensures that the data from field inspection teams makes its way to Maximo and ultimately to the Fire Department.

The American Water Works Association (AWWA) provides recommendations for both inspection and flow test procedures in its M17 manual, "Installation, Field Testing, and Maintenance of Fire Hydrants." In addition to recommending the particular process for performing individual inspections and flow tests, the AWWA makes the following recommendations on frequency:

- "All hydrants should be inspected regularly, at least once a year, to ensure their satisfactory operation. In freezing climates, dry-barrel hydrants may require two inspections per year."
- "It is good practice to conduct flow tests on all parts of the distribution system approximately every 10 years (or whenever needed) to identify the service areas affected by significant changes in the distribution system."

DC Water's inspection and flow test procedures very closely follow the AWWA's standards; the M17 manual is implemented as one of the Department of Water Services' procedure documents. The Department of Water Services' goal is to perform inspections at least once per year as recommended, and to flow test hydrants at least once every six years, which, if attained, is significantly better than the AWWA's recommendation.

Scope

This audit was conducted as a part of the approved 2011 Internal Audit plan. The audit was initiated in January 2011 and completed in March 2011. The audit included a review of both the planned annual fire hydrant inspection process and DC Water's current flow testing process, as well as a review of the timeliness of fire hydrant repairs when a hydrant was reported as out-of-service.

Internal Audit conducted walkthroughs with individuals involved with the various types of inspection and flow testing within the Water Services group. Internal Audit used the results of these walkthroughs to determine what types of processes exist at DC Water with regard to keeping public hydrants operational relative to the goal of combating fires. We also researched best practices as established by the American Water Works Association and compared those practices to DC Water's processes.

Following walkthroughs, Internal Audit performed test sampling on flow-test results to identify deficiencies in the control system.

Objectives

Internal Audit established three objectives for its review of the fire hydrant maintenance process:

- Confirm that DC Water has a program in place for assuming the fire hydrant inspection role from the DC Fire Department and that the program is in accordance with American Water Works Association recommendations.
- Confirm that DC Water performs regular flow testing in accordance with American Water Works Association recommendations.
- Confirm that DC Water repairs known out-of-service fire hydrants in a reasonable time.

Summary of Work

Internal Audit was able to confirm that DC Water has implemented a program to assume the fire hydrant inspection role from the DC Fire Department once the official Memorandum of Understanding has been implemented. Internal Audit reviewed the procedures of the program in detail, covering both the inspections of individual hydrants (which mirror the AWWA's recommended procedures) to the method of assigning hydrants to inspection teams. We also attempted to review the quality assurance process which DC Water currently applies to fire hydrant information received from inspection teams. However, because data artifacts from the process are not stored long term, we were unable to independently verify that the quality assurance function works as designed.

We also reviewed the procedures for flow testing and found them to be in accordance with AWWA guidelines. We did note, however, that only 55% (5,050 hydrants out of 9,144) of DC Water's public fire hydrants have flow test data from within the last ten years (Internal Audit reviewed flow tests using both the AWWA's ten-year flow test standard and DC Water's stricter six-year standard). We noted that the current flow test process has only been in place since 2007. Through discussions with management, we learned the following:

- The flow test process was initially tied to the replacement of several broken or older model fire hydrants to a standard hydrant approved by the National Fire Protection Association (NFPA). As hydrants were replaced, they were also flow tested.

- The fire hydrant replacement program was divided into two phases. The goal of Phase I was to replace approximately 3,500 hydrants to the NFPA-type standard, and this phase was accomplished in full two years ahead of schedule. Phase II is ongoing, and will result in the replacement of all remaining non-NFPA hydrants.

- According to management, because of the cost involved with testing a hydrant which will eventually be replaced by an NFPA-type hydrant anyway, District government urged the Department of Water Services to only test hydrants which already conform to the NFPA-type standard. This accounts for 5,507 of DC Water's 9,144 hydrants (60%). Of these, 4,516 hydrants have been tested (82% of NFPA-type hydrants), and the remainder are due to be tested in the next flow test cycle.

Non-NFPA-type hydrants are occasionally flow tested by DC Water, usually in conjunction with requests from the DC Fire Department, but they are not required to be flow tested per DC Water's policies or procedures. Given the AWWA's recommendation of testing all parts of the distribution at least every 10 years, we suggest that the Department of Water Services confirm that the hydrants which have been tested, at a minimum, account for each portion of the distribution system. We also recommend that, long term, DC Water continue with its goal of standardizing all hydrants to NFPA-type hydrants and flow test each of them at least once every 10 years.

We obtained evidence that the overall number of fire hydrants out of service is low. DC Water maintains a goal of allowing only 1% or less of its hydrants to be out-of-service due to reasons it can control, and we noted that, with some fluctuation, it has maintained this goal. This indicates that DC Water's turnaround time for fire hydrants is at least fast enough to keep pace with new hydrant issues as they appear.

We recommend that in its reporting to the Board of Directors, the Department of Water Services should reference a monthly average of hydrants out-of-service for a given month, as well as a minimum and maximum value of hydrants out-of-service in each month, to allow for an enhanced reporting scheme.

SC&H Consulting

By: _____
Joe Freiburger, CPA, CIA

II. DETAILED OBSERVATIONS & RECOMMENDATIONS

The existence of internal control gaps could increase the likelihood that future errors or inappropriate transactions would not be prevented or detected. In order to mitigate this risk, we have provided recommendations to remediate the control gaps via the implementation of additional controls or modification of existing controls. However, we also recommend that management consider the cost-benefit of additional controls prior to implementing any changes.

Observation #1	Internal Audit Recommendations	Management Comments
Observations: DC Water currently performs a Quality Assurance review of data it obtains from inspection crews. Currently, the data comes from DC Fire Department inspection teams, and is reviewed as it is submitted. The review consists of a series of manual and automated checks which contain data submitted by the inspectors. The data reviewed includes the number of hydrants inspected, a check for duplicate inspections, operational status between Maximo and the inspector's data, and any changes in recorded hydrant attributes, such as flow band color or nozzle type. Differences in the data are flagged for review in a file which QA personnel review daily.	***Recommendation(s):*** Internal Audit recommends that the Department of Water Services maintain the artifact files generated by the QA process for a period of at least one year to provide a historical record of activity for reference purposes. ***Business Owner(s):*** Charles Kiely, Assistant General Manager, Department of Consumer Services	***Management's Action Plan and Implementation Date:*** Management agrees to maintain the emails containing the artifact files associated with the quality assurance process for a period of one year effective immediately.

Observation #1	Internal Audit Recommendations	Management Comments
A flagged hydrant may indicate that a repair order was not placed by the inspection crew according to procedure, but needs to be placed. As hydrant issues from the QA process are resolved, they are removed from the list of issues. We attempted to review this quality assurance process. However, data artifacts from the process are not stored long term, and we were unable to independently verify that the quality assurance function worked as designed during its audit period. An obviously broken hydrant (i.e. one that leaks or is physically damaged) could be reported broken again by a third party and a repair team could be sent out, but because the QA process is performed daily on inspected hydrants, it allows for a much more timely response if a hydrant was not initially reported by the inspection crew.		

Observation #2	Internal Audit Recommendations	Management Comments
Observations: The American Water Works Association (AWWA) recommends performing flow tests on "all parts of a distribution system" at least every 10 years. In the course of our audit, we determined that the Department of Water Services does not have a clear policy regarding frequency of flow testing for the current state of its fire hydrant system. We determined that DC Water had flow test results for 55% of its total hydrants (5,050 out of 9,144). We were not able to determine if this testing accomplished, at a minimum, the AWWA's recommendation of flow testing all parts of the distribution system at least once every 10 years. There are several reasons why all hydrants in the District have not yet been flow tested. DC Water's current, formal flow test process began in 2007, and DC Water hasn't had enough time to perform flow tests on all hydrants.	***Recommendation(s):*** DC Water should clearly document its own policies for flow test and inspection frequency and align them with both DC Water's organizational goals and industry best practices. Additionally, the Department of Water Services should determine if the hydrants it has tested or plans on testing meets the AWWA's minimal goal of flow testing "all parts of the distribution system every 10 years." ***Business Owner(s):*** Charles Kiely, Assistant General Manager, Department of Consumer Services	***Management's Action Plan and Implementation Date:*** Management's policy is to perform flow testing on all parts of the distribution system in accordance with AWWA guidelines. DC Water is currently in year four of its flow testing program and we fully anticipate completing this process within 10-years. However, Management agrees to formalize its policy statement regarding flow testing hydrants consistent with the AWWA guidelines and best practice organizations. This will be completed in May.

Observation #2	Internal Audit Recommendations	Management Comments
Additionally, DC Water currently has a wide range of different models of hydrants, both standardized, NFPA-approved hydrants and non-NFPA types. DC Water is in the process of replacing all non-NFPA hydrants with NFPA hydrants. A decision was made to focus testing on the NFPA hydrants since the non-NFPA hydrants would be replaced eventually anyway. Adherence to the AWWA's best practice recommendation provides assurance that DC Water's fire suppression system will be able to provide the water flows necessary to fight fires throughout the city. Additionally, maintaining a documented internal policy with flow test and inspection frequencies provides a clear and measurable goal for the Department of Water services to attain.		

Observation #3	Internal Audit Recommendations	Management Comments
Observations: DC Water uses a combination of third-party contractors and internal crews to perform its fire hydrant flow testing. One of the third-party crews, Nastos, is required to indicate who performs a flow test, and who checks the test, on DC Water's "Field Report Form: Flow Test." Additionally, the test approver is supposed to sign the form upon completion of the test. We sampled 30 individual flow tests, including 7 tests performed by Nastos. In all 7 instances, we noted that none of the three fields on the form (Test Performed By, Test Checked By, or Test Approved By) were signed. The proper signatures on the forms can indicate whether the results of a flow test were actually reviewed by personnel within DC Water and that the flow test results were accurate.	***Recommendation(s):*** DC Water should ensure that, where required, flow testers indicate who performed a flow test, and should provide some indication that DC Water reviewed and approved the results. ***Business Owner(s):*** Charles Kiely, Assistant General Manager, Department of Consumer Services	***Management's Action Plan and Implementation Date:*** Management agrees that all fields on the field data form should be completed, signed, and dated. Management will inform all contractors involved in flow testing that effectively immediately flow test data forms shall be certified, signed and dated as a condition for acceptance and payment.

Observation #4	Internal Audit Recommendations	Management Comments
Observations: DC Water's internal goal is to ensure less than 1% of its hydrants are out-of-service at any given time. DC Water reports its achievement of this goal to the Board of Directors monthly in a report which shows the percentage of out-of-service hydrants. However, the results are reported as of one particular day in the month. Internal Audit performed testing to verify that DC Water met its 1% out-of-service requirement throughout the months in its audit period, and was able to obtain assurance that DC Water is maintaining the 1% goal. Nevertheless, the reporting of achievement of that goal could be improved by reflecting results accomplished throughout the month.	***Recommendation(s):*** Department of Water Services should consider reporting to the Board, results based on a monthly average and monthly minimum/maximum percentage of hydrants out-of-service, rather than a snapshot of performance on a single day. ***Business Owner(s):*** Charles Kiely, Assistant General Manager, Department of Consumer Services	***Management's Action Plan and Implementation Date:*** Management disagrees with this recommendation. The concern in calculating monthly averages and monthly minimums/maximums is that these statistics will include hydrants taken temporarily out of service to perform main, valve, service line, hydrants replacement and CIP work based on the way the data is currently stored. In effect this method will overstate the number of hydrants out-of-service due to a defect and understate the department's performance related to this goal without first scrubbing the data. Further, the Board's Water Quality and Water Services Committee receives detailed reports monthly and staff, Fire and EMS and the general public receive daily reports on the hydrant status.