DISTRICT OF COLUMBIA
WATER AND SEWER AUTHORITY

Board of Directors

Audit Committee

Thursday, November 29, 2012

9:30 a.m.

1. **Call to Order**..... Bradford Seamon, Chairperson

2. **Presentation on DC Water's Asset Management program** ..... Chris Carew, Chief of Staff

3. **Review of Internal Audit Status** ……. …….....Joseph Freiburger
   A. IT Help Desk & Computer Operations Report Final
   B. Biosolids Operation Report Final

4. **Update on Establishing Fraud Hotline**……..Joseph Freiburger

5. **Executive Session**……. Bradford Seamon

6. **Adjournment**

Asset Management

A proposed program to reduce DC Water's annual capital, operating and maintenance costs

Audit Committee Meeting
November 29, 2012

Today's Discussion

- Describe *what* is asset management, and explain *why* it is needed
- Describe *how* are we doing asset management to ensure sustainability
- Describe *when* we are doing asset management – reporting on what's already happened, happening now, and will happen

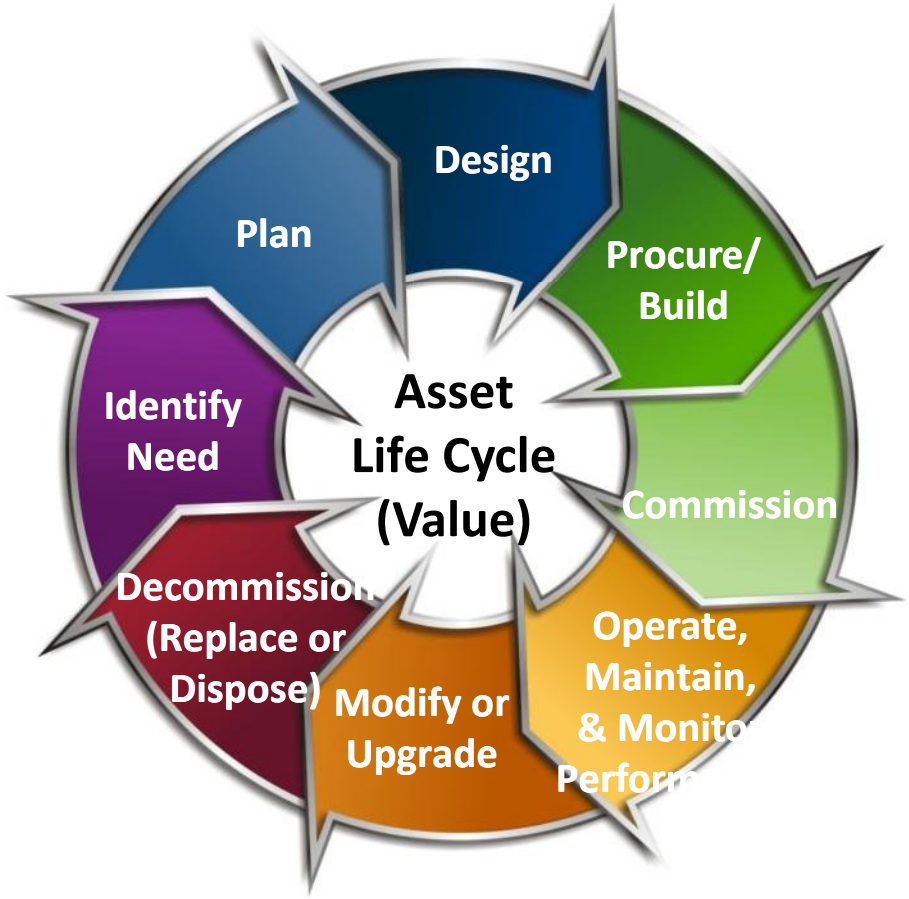
Asset Management Defined

- A comprehensive business program advocated by the US EPA and the utility industry to optimize infrastructure sustainability
- The practice of managing infrastructure capital assets to minimize the total cost of acquiring, operating and maintaining them, while improving service levels
- Incorporates detailed asset inventories, data management, related business processes and long-range financial planning to drive decision-making
- Optimizes ability to prioritize capital program projects and preventative maintenance work

Why Implement An Asset Management Program

- We manage assets worth billions of dollars with an added $3.6 billion coming online in the next 10 years.
- A comprehensive AM program preserves these investments by incorporating best practices, improved service life and lower life cycle costs
- Saving just one percent in life cycle costs *on our new assets alone* saves $35 to $40 million
- *The Executive Team and the DC Water Board of Directors concluded that Asset Management is a strategic priority*

Asset Management Will Guide Our Future Investment Decisions



Core questions framework:

1. Current state of assets?
2. Required sustained level of service?
3. Assets critical to sustain performance?
4. Best minimal life-cycle costs (CIP + O&M)?
5. Best long-term financing strategy?

Assets Presently Managed

- 1,300 miles of water distribution pipes
- 1,800 miles of collection system pipes
- 125,000 water meters (our cash register)
- 9,300+ fire hydrants
- 38,000 valves
- 31 pump stations
  - 5 water pump stations
  - 9 sanitary and combined pump stations
  - 16 storm water pump stations
  - 1 Swirl Facility
- Five reservoirs; four storage tanks
- Thousands of “critical” assets comprise Blue Plains wastewater treatment plant

New Assets Coming On-line

- Four major tunnels and their support systems (mandated by consent decree)
- The enhanced nitrogen removal facility (mandated by permit)
- The advanced combined heat and power facility
- Poplar Point Pump Station
- Odor Control Facilities

How Do We Implement a World-class Asset Management Program

- Identify and leverage efforts “independently” underway
- Advance “Team Blue asset management proposal” through future budgeting and planning efforts
- Incorporate “lessons learned” from others in industry who have attempted to implement asset management

Leveraging Programs and Initiatives

- Materials Management Project
  - Provide the right parts at the right time to the right place to perform maintenance without delay at a reduced cost
- Maximo and Lawson Enhancements
  - support improved planning and scheduling
  - capture all data to calculate true life-cycle costs
- SCADA master plan project
  - Monitors critical assets in the distribution and collection system
- Advanced Metering Infrastructure Project
  - Provides for two-way communication to our meter assets
  - AMI network can be leveraged for leak detection initiative

What's Been Done

Established Team Blue, Asset Management program objectives:

- Meet or exceed all legal and regulatory environmental requirements
- Optimize asset life-cycle costs
- Implement Asset Management best practices in all related business processes
- Establish a culture of continuous improvement
- Educate staff in asset management principles
- Maintain reliable and robust systems
- Leverage appropriate technologies
- Access and utilize accurate data to make sound business decisions
- Forecast future investment needs based on Asset Management principles

What's Been Done

Foundation work to build a world-class program

- Program framework development with three implementation stages, including five initiatives, with estimated costs and resources identified
- Gap assessment and education on best practices including site visits with other utility leaders (Seattle Public Utilities, Sacramento Regional County Sewer District)
- Examined less successful attempts at implementation to avoid repeating mistakes
- Leadership Team approved plan and request to seek board support (May 1, 2012)

What's Been Done

Foundation work to build a world-class program

- Bridge project established to provide asset management technical support (September 2012 – March 2013)
- Report on "IT Situation in Support of Asset Management" (October 2012)
- Blue Plains further development and implementation of Maximo System in support of asset and maintenance management work activity
- $20 million established in FY 13 CIP for five years of disbursements – to be reassessed when RFP finalized and deliverables established

What's Happening Now

Foundational work to build a world-class program:

- Ongoing technical support to Customer Care Operations Department (Water, Sewer and Water/Sewer Pumping Maintenance)
- Focus on water distribution valve assets to meet data and work management needs for valve control center and related field crew work activity
- Continued use of Maximo System to support work order process for daily coordination of operations and maintenance group activity

What's Happening Next

Building a world-class program:

- Water and Sewer Pumping Maintenance asset data collection and Maximo workflows to support use of system for maintenance activity (leverages existing Blue Plains Maximo Workflows)
- Continue valve control center focus to transition data and work activity to Maximo and GIS-based solution (replacing field "map books" and valve database)
- Establish GIS (Geographic Information System) Governance Team (DC Water-wide)
- Define IT integration for Maximo and GIS

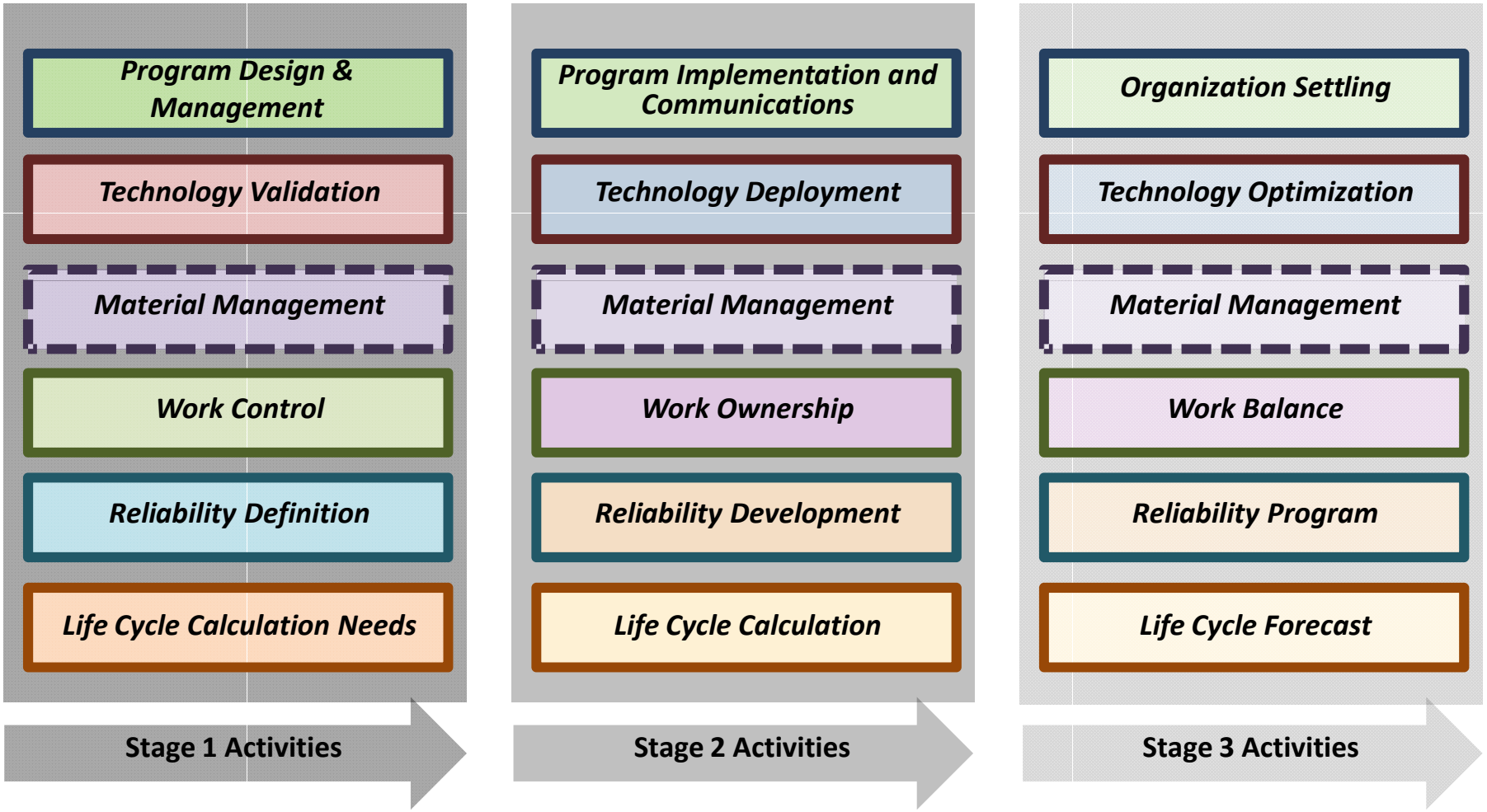
What's Happening Next

Building a world-class program:

- Continue enhancements to Maximo System to better support planned and preventive maintenance activities
- *Develop* an RFP to establish support for full Asset Management plan implementation
- Establish training needs and incorporate into learning and development program

Validate Team Blue Asset Management Program Recommendations

Three stages of Asset Management Development:



Challenges

- This effort requires a significant culture change. Therefore, we have to make a commitment to change all of our operating and support processes. Procurement needs to be streamlined, and the comprehensive transformation and alignment of HR with the private industry (where the employee hiring process and pay are based on return on investment and not an arbitrary scale) needs to be realized.

Challenges (Cont'd)

- Our Debt Service is increasing at a rate where it will consume a large portion of the operating budget. Asset Management is required to prioritize spending to control this debt service… Seattle got crippled by this.

Challenges (Cont'd)

- There is a lot of focus on Non-debt operating costs. Yes, it is important, but cutting operating and maintenance costs is small potatoes and is counterproductive. However, streamlining how we operate and maintain facilities is good business and contributes to slowing the rate of required re-investment. It is this slowing of the rate of re-investment (premature rebuilding) where we need to focus. Hence, we have an initial bump in cost for long term gain.

Thank you!

Questions?

Internal Audit Update

Audit Committee Meeting

November 29, 2012

The following represents a summary of the activities and achievements since the September 27, 2012 meeting.

I. HIGHLIGHTS:

Performance of scheduled internal audits – Internal Audit performed audit work in two separate audit areas. Additionally, two final reports were issued from projects completed in the prior fiscal year - - - IT Help Desk and Computer Operations, and Biosolids Management. The two current audit projects underway are the Purchasing-Card and Chemicals Purchasing audits. Each are in the fieldwork phase. The chart below depicts the planned projects and their status for the fiscal year.

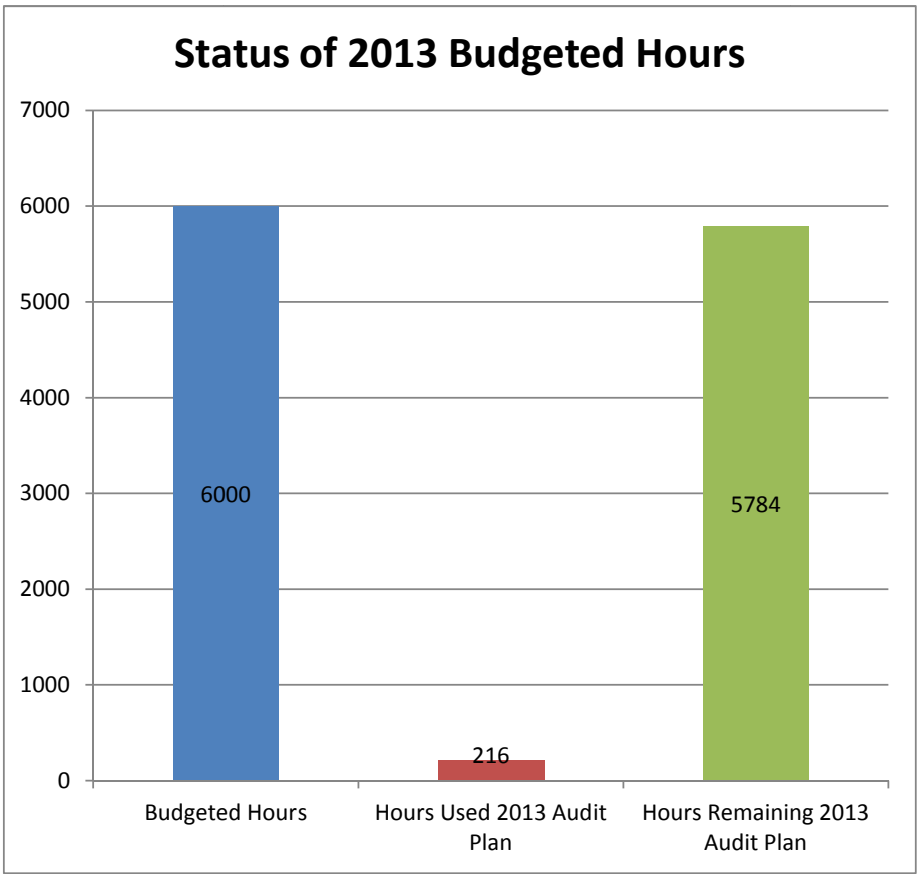
A. **Stage of Audits & Special Projects -** The following represents an indication of the stage of completion for each scheduled audit and requested special project.

PROJECT	PLANNING / SCOPING	FIELDWORK	DRAFT REPORT	FINAL REPORT
Regulatory Compliance				
P-Card				
Chemicals Purchasing				
Cashiering Remote Site				
Engineering – High Priority				
Investments & Cash Management				
Maintenance Services				
IT Network Security				
Fleet Management				
Sewer – Emergency Services				
PCCS				
Utilities – Repairs & Flushing				
Warehouse Operations				
IT – SDLC & Change Management				

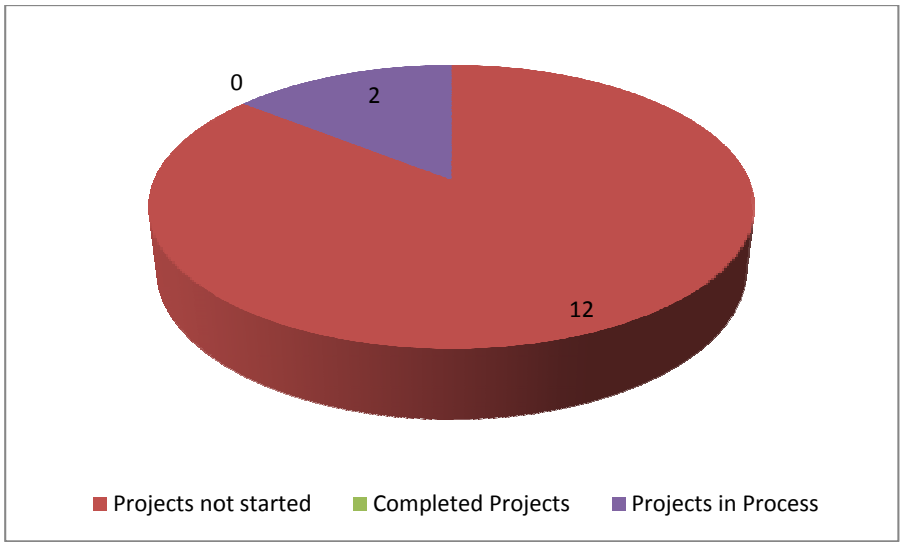
B. **Analysis of key milestone dates -** The following represents an indication of the date of completion of key project milestones.

PROJECT	START DATE	FIELDWORK END DATE	DRAFT REPORT ISSUANCE DATE	FINAL REPORT
Regulatory Compliance				
P-Card	10/12/2012			
Chemicals Purchasing	11/5/2012			
Cashiering Remote Site				
Engineering – High Priority				
Investments & Cash Management				
Maintenance Services				
IT Network Security				
Fleet Management				
Sewer – Emergency Services				
PCCS				
Utilities – Repairs & Flushing				
Warehouse Operations				
IT – SDLC & Change Management				

C. **Analysis of Hours –** The chart below indicates the actual hours used through October 31, 2012 toward completion of the internal audit plan, along with an indication of the total hours included in the 2013 plan.



II. 2012 Audit Plan Status



A. Reports Issued Since Last Audit Committee Meeting

IT Help Desk and Computer Operations –

Our overall audit objectives included identifying the existing practices, evaluating, and testing the effectiveness of DC Water's Help Desk function. In addition, various DC Water computer operations processes and controls were assessed to ensure procedures are consistently and correctly applied to the storage and processing of DC Water data. Specific audit objectives focused on:

- Determining whether related policies and procedures are formally documented, approved, and are consistent with industry standards and best practices
- Determining whether management has defined and implemented a formal mission statement for the DC Water IT Help Desk.
- Determining whether management has established clear roles and responsibilities for the help desk function.
- Assessing the physical operations of the help desk function including the recording and handling of problems reported in person, via phone, e-mail, and the web.
- Determining whether the functionality (i.e. recording and tracking of tickets, reporting capabilities, etc.) of the help desk software/application in use is adequate given the current size of the organization and the complexity of the support process.
- Determining whether reported problems are adequately documented, appropriately escalated in accordance with priority, and addressed/closed in a timely manner and within any established Service Level Agreements (SLAs).
- Determining whether reports and/or performance metrics are produced and utilized for tracking, monitoring, and evaluating DC Water IT problem management.
- Determining whether adequate staffing is available to meet customer demand and resolve reported issues in a timely manner.
- Verifying that support tickets are maintained in a live database for at least 1 year before being archived for a set period of time.
- Assessing the training and continuing education programs in place for all help desk technicians.
- Validating that all doors to the DC Water data centers are properly secured and that physical access is limited to only those individuals with a valid business need.
- Determining whether physical access privileges are appropriately approved prior to being granted, properly revoked upon user termination, and that access logs are appropriately reviewed on a periodic basis.

- ❑ Verifying that a backup scheduling tool has been implemented and is appropriately configured to complete data and system backups in conjunction with their frequency of update.
- ❑ Determining whether administrator access to the backup scheduling tool is appropriately restricted to only authorized users with a valid business need for access.
- ❑ Verifying regular offsite backup tape rotations, and assessing the accuracy of backup tape inventories through physical inspection of media.
- ❑ Determining whether periodic backup tape restoration testing is performed.
- ❑ Determining whether access to batch job functions is restricted to only authorized users with a valid business need for access.
- ❑ Assessing the process for identifying and addressing processing errors and/or failed batch jobs.

Internal Audit (IA) concludes that a number of topics should be addressed by management in order to further strengthen DC Water's help desk support and improve various aspects of the computer operations control environment.
In particular, there is a need to address the following:

- ❑ Increase the number of full-time DC Water help desk technicians
- ❑ Require those outside contractors serving as DC Water help desk technicians to provide evidence of ongoing training and continued professional education as it relates to information technology
- ❑ Enforce the existing backup rotation policy and ensure all critical system backup tapes are rotated to an offsite location on a weekly basis
- ❑ Install some form of fire suppression system, and repair the roof to protect against water leaks in the DC Water data center at 810 First Street, NE, Washington DC
- ❑ Consider relocating the data center at 301 Bryant Street, NW, Washington DC to a new location that provides for better protection against fire damage and allows for increased air circulation and cooling
- ❑ Install additional AC units in the COF Blue Plains data center to allow for increased cooling capabilities and the temporary air conditioning window unit to revert back to emergency use only
- ❑ Add more capacity to existing UPS systems and/or consider installing backup generators to provide power to the data centers should the regular power supply be unavailable for an extended period of time
- ❑ Determine who has access to each of the five DC Water data centers and conduct periodic access reviews on at least a quarterly basis to ensure physical access rights are restricted to authorized personnel only

This audit resulted in the addition of eight Management Action Items in the chart in Section III Follow Up.

Biosolids Management–

Internal audit established four objectives for its audit of the Biosolids Operations:

- Ensuring that monthly reconciliations of the allocation of costs between DC Water and Washington Suburban Sanitary Commission (WSSC) are being performed consistently and being appropriately documented since implemented in the previous Biosolids Audit (FY2010)
- Evaluating overall effectiveness and efficiency of the Biosolids process, including checking scale calibration to ensure accuracy
- Examining the monthly Biosolids Oversight Committee Meeting minutes to identify whether any areas for concern were properly addressed
  Reviewing the prior certification report (issued by DEKRA Certification October 2011) to determine whether reportable items were sufficiently addressed.

The Biosolids Management Program at DC Water maintains a program manual which describes the Biosolids program activity and documents its mission, policies and procedures. During the examination of this manual, we noted that the manual is revised regularly and through limited observation DC Water's Biosolids program appears to be adhering to policies and procedures set forth in the manual. Based on our observations, DC Water strives to have its Biolsolids Program operating at a high level and as environmentally friendly as possible.

DC Water plans to introduce their new "digester" to create a safer and even more environmentally friendly Biosolids process while producing a higher quality product.

We examined the most recent Environmental Management System (EMS) Biosolids Audit of DC Water conducted in 2011 and inquired on the status of nonconformance items to ensure that they have been resolved. The audit is performed every 5 years and provides an indication as to DC Water's Biosolid Management Program adherence to the standards set forth by the National Biosolid Partnership (NBP). After reviewing the audit findings, we noted 4 minor nonconformance issues. We followed up on the status of those issues and determined that all had all been resolved.

There are four scales being utilized for weighing of biosolids being hauled from the Blue Plains location. We identified that all scales are calibrated, at a minimum, on an annual basis. We verified that documentation was maintained evidencing the calibration within the previous 12 months.

Biosolid workgroup meetings are held on a monthly basis. One of the items identified within the most recent EMS Biosolid Audit was that the minutes of the meetings were insufficient to capture the content of the meetings. We reviewed the minutes for the previous six months and noted that they were complete, detailed, and sufficiently captured the contents of the discussions. Additionally we verified that any noted items within the minutes were being properly addressed and resolved as indicated in subsequent meeting minutes.

We examined the most current Biosolids hauling contract with NutriBlend to ensure that the contractors were adhering to the appropriate rules and regulations. After reviewing the contract, we noted that the contractors were adhering to the appropriate rules and regulations, holding the necessary hauling permits and maintaining the Certified Nutrient Management Planner to ensure Biosolids meet conformance standards.

Finally, Internal Audit examined the Biosolids monthly reconciliations pertaining to WSSC to ensure that the reconciliations are being performed consistently and accurately. We noted that the reconciliations were not being performed on a monthly basis but on an annual basis due to understaffing. Management hires a contractor at the end of the fiscal year to perform the reconciliation process and recommended to continue to perform them annually. Through review of the previous 12 months of reconciliations we identified little to no reconciling items. Additionally through discussion with individuals responsible for performing the reconciliations, we determined that performing them at year end at the same time that (WSSC) performs their year-end true-up facilitates the efficiency in performing the reconciliations. We concluded that the timing of the performance of the reconciliation is sufficient.

This audit resulted in the addition of no Management Action Items in the chart in Section III Follow Up.

III. Follow Up

In addition to our work performed relative to the audit projects identified in the 2013 Internal Audit Plan, Internal Audit conducted follow-up activity relative to previously reported audit comments. The table below summarizes the issues by area of responsibility and the current status of the action plan proposed by Management.

	Chief Engineer	AGM Wastewater Treatment	AGM Consumer Services	Chief Financial Officer	General Counsel	Chief Information Officer	AGM Support Services	General Manager	Total
New Management Action Plans Since Previous Meeting	-	-	-	-	-	8	-	-	8
Management Action Plans Implementation Date Not Expired	1	8	-	1	-	3	19	-	32
Management Action Plans Implementation Date Expired	-	-	1	1	-	4	2	-	8
Total	1	8	1	2	-	15	21	-	48

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

AGM Consumer Services

1. 2011 Pumping & Storage Water Leakage - Internal Audit noted that DC Water does not currently have an active leak detection program in place. Several systems have now been tested and a decision was made relative to the most suitable product for DC Water. The system has not yet been fully implemented. Currently, DC Water repairs leaks when a surface leakage is reported.

Chief Financial Officer

1. 2011 Grants Operations Audit – Internal Audit noted invoices for grant reimbursement are manually identified by reviewing activity in the Lawson and ImageNow systems. All active grant balances are manually maintained and reconciled in multiple spreadsheets. This highly manual grant reimbursement process is prone to error, which may lead to grant balance inaccuracies or incorrect management decisions. An automated solution was recommended.

Chief Information Officer

1. 2012 IT Operating and Business Applications - Testing details and appropriate formal sign-off from the post-implementation review were not consistently documented and maintained during the most recent Lawson system upgrade for all necessary phases. Based on review of supporting documentation and inquiry with implementation project management, it was determined that approvals for exceptions, test results, and the post-implementation review were verbally communicated and informally recorded during project team meetings. A more formal testing and documentation process should be implemented.

2. 2012 IT Governance Internal Audit - A fully implemented and functioning IT Strategic Plan is not in place. An IT Strategic Plan was developed in the past but it is out-dated and does not contain critical components such as goals, objectives, and measurements for IT performance, success, and budgeting.

3. 2012 IT Governance Internal Audit - A formal, periodic review of the IT system inventory is not being performed by the IT Department. A periodic inventory including change authorization, critical components, system versions, on-boarding effectiveness, modification dates, and contractual requirements is a practice that most organizations perform to gain confidence that risks are being mitigated with regard to systems in operation.

4. 2012 IT Governance Internal Audit - A fully functioning and effective IT Governance Committee for DC Water is not in place. There is no group charged with making certain that important IT initiatives are fully vetted, implemented, executed and monitored in accordance with the overall direction of DC Water business operations and organization-wide goals. A committee consisting of members of both the business units and the IT management team should hold responsibility for making decisions about the need for and prioritization of IT projects.

AGM Support Services

1. 2011 Human Capital Management - The DC Water policies related to employment laws and regulations have been revised to reflect current laws and regulations; however, these updated policies have not been officially approved by the General Manager and made available to all DC Water employees.

2. 2011 Safety Programs Training & Compliance Management - There was no effective follow-up process in place regarding identified safety violations for inspected facilities. It was recommended that a monitoring process be implemented to ensure corrective action is taken within the required 45 days. Subsequently a suitable software package has been acquired to track and report the incidents. The system is in the implementation phase.

OTHER TOPICS:

Internal Audit is collaborating with DC Water's Chief Financial Officer regarding his initiative to develop a Fraud Mitigation plan for the organization. A Fraud and Abuse hotline process is being implemented and it is anticipated that it will be operational by February 1, 2013.

Internal Audit is also assisting the IT and Finance areas in reviewing inventory records with regard to IT Equipment and Fleet property and equipment. DC Water engaged an outside firm to perform a physical inventory of these items for 2012. There were substantial discrepancies between the results of the actual count and DC Water's inventory records. Internal Audit has deployed professional staff to assist in reconciling the open variances.

SC&H GROUP, LLC

dc water is life

IT Help Desk & Computer Operations

Internal Audit Report

October 5, 2012

INTERNAL AUDIT TEAM

Manager:	Anthony DiGiulian
Principal:	Scott Heflin
Director:	Joe Freiburger

DC Water – 2012 Internal Audit
IT Help Desk & Computer Operations

SC&H GROUP, LLC

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EXECUTIVE SUMMARY

Background

As a major utility, DC Water is dependent on information technology to support critical mission and business processes. Since the establishment of the DC Water IT Department in 1999, the Authority has been increasingly applying information technology in an operational capacity as a business enabler to reduce costs and increase efficiency. In addition to its role in supporting day-to-day operations from multiple computer systems, platforms and applications, the DC Water IT Department is responsible for deploying technology to reduce complexity , increase the efficiency of support operations; deploying communications technologies to connect geographically dispersed or remote locations; and enabling mobile computing and remote telecommuting to support off-site access.

The dependency on information assets (systems and data) creates risks that must be managed appropriately to ensure efficient and effective operations. The IT help desk and problem management capabilities, backup and recovery of critical systems and data, and physical and environmental security of the data centers are all key areas of focus for effective IT operations. Each contains specific risks that could threaten the efficiency of DC Water systems and adversely impact business operations if not appropriately addressed and managed by the DC Water IT Department.

Objectives

Our overall audit objectives included identifying the existing practices, evaluating, and testing the effectiveness of DC Water's Help Desk function. In addition, various DC Water computer operations processes and controls were assessed to ensure procedures are consistently and correctly applied to the storage and processing of DC Water data. Specific audit objectives focused on:

- Determining whether related policies and procedures are formally documented, approved, and are consistent with industry standards and best practices
- Determining whether management has defined and implemented a formal mission statement for the DC Water IT Help Desk.
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- Verifying regular offsite backup tape rotations, and assessing the accuracy of backup tape inventories through physical inspection of media.
- Determining whether periodic backup tape restoration testing is performed.
- Determining whether access to batch job functions is restricted to only authorized users with a valid business need for access.
- Assessing the process for identifying and addressing processing errors and/or failed batch jobs.

Audit Scope and Procedures

This audit was conducted based on the approved 2012 internal audit plan. The audit was initiated in June 2012 and completed in September 2012. The audit included an evaluation of the DC Water's controls over IT help desk support, physical security to the data centers, data backups, and batch

monitoring during FY2012. The audit process included interviews with applicable members of the Department of Information Technology and DC Water management, as well as a review of existing policies, procedures, critical reports, and other supporting documentation. Emphasis was placed on the identification of significant risks; impact on critical systems; review of key controls; and examination of IT standards, policies, and procedures.

Summary of Work

Internal Audit (IA) concludes that a number of topics should be addressed by management in order to further strengthen DC Water's help desk support and improve various aspects of the computer operations control environment.

In particular, there is a need to address the following:

- Increase the number of full-time DC Water help desk technicians
- Require those outside contractors serving as DC Water help desk technicians to provide evidence of ongoing training and continued professional education as it relates to information technology
- Enforce the existing backup rotation policy and ensure all critical system backup tapes are rotated to an offsite location on a weekly basis
- Install some form of fire suppression system, and repair the roof to protect against water leaks in the DC Water data center at 810 First Street, NE, Washington DC
- Consider relocating the data center at 301 Bryant Street, NW, Washington DC to a new location that provides for better protection against fire damage and allows for increased air circulation and cooling
- Install additional AC units in the COF Blue Plains data center to allow for increased cooling capabilities and the temporary air conditioning window unit to revert back to emergency use only
- Add more capacity to existing UPS systems and/or consider installing backup generators to provide power to the data centers should the regular power supply be unavailable for an extended period of time
- Determine who has access to each of the five DC Water data centers and conduct periodic access reviews on at least a quarterly basis to ensure physical access rights are restricted to authorized personnel only

SC&H Consulting

By:

_____

Joe Freiburger, CPA, CIA

II. DETAILED OBSERVATIONS & RECOMMENDATIONS

I. IT Help Desk - Staffing		
Observation: The DC Water Help Desk function appears to be understaffed. Currently, there are 6 technicians (4 contractors & 2 full time employees) responsible for providing help desk support to approximately 1600 end users. Typical help desk ratios run about one help desk technician for every 150 end-users. DC Water interns provide additional assistance on a sporadic basis, however even with this added support, the limited number of available help desk resources is forcing Supervisor/Tier 3 personnel to assist with answering phone calls, logging tickets, etc. **Risk:** If the help desk function is not properly staffed with an adequate number of help desk technicians available to support the end users, then reported problems and incidents may not be reviewed and addressed in a timely manner. By requiring Supervisor/Tier 3 personnel to regularly assist with answering phone calls and logging tickets, help desk managerial job responsibilities including reporting, setting training schedules and agendas, iSupport administration, staff development and evaluations, etc. may not get completed.	**Recommendation:** Internal Audit recommends that DC Water management hire at least 2 additional full time help desk technicians. The added support will help to ensure all reported problems and incidents are evaluated, escalated, and addressed in a timely manner. The added support will also allow for Supervisor /Tier 3 personnel to focus more of their efforts on improving the overall operations of the help desk function and various help desk managerial responsibilities (e.g. monitoring problems reported by users, help desk system administration, project management, help desk staff development, scheduling, etc.).	**Management's Action Plan:** IT Management agrees with the recommendation and has already begun addressing the observation through the IT Division's reorganization process. A revised IT Organizational Chart and positions have been submitted to Human Capital Management (HCM) and are pending approval. Once these items have been approved, Management will begin the hiring process for additional help desk technicians. **Implementation Date:** 12/31/2012

II. IT Help Desk - Training		
Observation: There is currently no process in place to ensure those outside contractors serving as DC Water help desk technicians are maintaining sufficient technical skills, and continuing to educate themselves on developments in hardware, software, and industry trends. Periodic, in-house IT training sessions are offered to full-time DC Water employees working as help desk technicians, however outside contractors are responsible for their own training and are not permitted to attend these training sessions. Currently DC Water does not require those outside contractors serving as DC Water help desk technicians to provide evidence of ongoing training and continued professional education as it relates to information technology. **Risk:** If outside contractors serving as DC Water help desk technicians do not receive periodic training on developments in hardware, software, and industry trends, then those individuals may lack the expertise required to effectively and efficiently evaluate and address help desk requests and reported problems and incidents.	**Recommendation:** Internal Audit recommends that DC Water management require those outside contractors serving as DC Water help desk technicians to provide evidence of ongoing training and continued professional education as it relates to information technology. DC Water management should also consider permitting those outside contractors serving as DC Water help desk technicians to attend the periodic, in-house IT training sessions being offered to full-time DC Water employees working as help desk technicians.	**Management's Action Plan:** IT Management agrees with the observation and will incorporate an assessment of ongoing technical training and continued professional education of those outside contractors serving as DC Water help desk technicians into the annual vendor management process. **Implementation Date:** 5/31/2013

III. Data and System Backups – Offsite Rotation		
Observation: Weekly offsite rotations of backup tapes to Iron Mountain were not consistently performed throughout the review period. Specifically, it was discovered that tapes were not rotated offsite during the first half of July 2012. **Risk:** Without effective procedures for regular offsite rotations of backup data, critical systems may not be able to adequately recover from a processing failure or onsite disaster (i.e. fire, flood) that destroys locally stored backup tapes.	**Recommendation:** Internal Audit recommends that DC Water enforce the existing backup rotation policy and ensure all critical system backup tapes are rotated to an offsite location on a weekly basis.	**Management's Action Plan:** IT Management agrees with the recommendation and has already taken steps to incorporate an additional IT administrator into the backup tape offsite rotation process. This additional administrator will help ensure the existing backup rotation policy is enforced and provide assistance with changing backup tapes and preparing tapes for weekly pickup and offsite storage at Iron Mountain. **Implementation Date:** 10/31/2012

IV. Data Center Environmental Safeguards- 810 First Street		
Observation: A number of issues were discovered in the DC Water data center currently housing multiple servers, network equipment, and VOIP equipment at 810 First Street, NE, Washington DC: - The roof directly overhead the data center is currently leaking water; - The data center does not have raised flooring in place to help safeguard the residing systems from flooding; - A fire suppression system has not been installed in the data center to help safeguard the residing systems from a fire. **Risk:** By not implementing appropriate environmental safeguards and controls within each data center, there is an increased risk of production systems being damaged by environmental factors such as high temperatures, humidity, flooding, fire, etc. Data loss and disruptions to the business may occur as a result of any production system damages.	**Recommendation:** Internal Audit recommends that DC Water management implement additional environmental safeguards and controls within the DC Water data center at 810 First Street, NE, Washington DC. Specifically, DC Water management should consider installing some form of fire suppression system, and repair the roof to protect against water leaks.	**Management's Action Plan:** DC Water will be moving all equipment and data center operations out of the 810 First Street location and into a new location at 80 M Street, SE, Washington DC starting the second week of October. An audit will be scheduled and conducted on the new space to ensure adequate environmental safeguards and controls are in place. **Implementation Date:** 10/31/2012

V. Data Center Environmental Safeguards – 301 Bryant Street		
Observation: A number of issues were discovered in the DC Water data center currently housing multiple servers, network equipment, and VOIP equipment at 301 Bryant Street, NW, Washington DC: - High air temperatures were present and appear to be caused by improper air circulation given the limited space of the room and total number of systems housed there; - A fire suppression system has not been installed in the data center to help safeguard the residing systems in the event of a fire; - An external window is present in the data center that subjects the residing systems to a potential water leak, storm damage, and direct sun light creating excess heat. **Risk:** By not implementing appropriate environmental safeguards and controls within each data center, there is an increased risk of production systems being damaged by environmental factors such as high temperatures, humidity, flooding, fire, etc. Data loss and disruptions to the business may occur as a result of any production system damages.	**Recommendation:** Given the limited space of the room and presence of an external window, Internal Audit recommends that DC Water management consider relocating the data center at 301 Bryant Street, NW, Washington DC to a new location that provides for improved environment safeguards and protection to the residing systems. If it is determined that a relocation of the data center is not feasible, then DC Water management should implement additional environmental safeguards and controls within the current location. Specifically, DC Water management should consider installing some form of fire suppression system, and assess whether additional AC units would help alleviate the existing cooling issues.	**Management's Action Plan:** IT Management agrees with the observation and will perform an evaluation of this space for the new fiscal year and determine if we have the budget to address the existing issues. **Implementation Date:** 2/28/2013

VI. Data Center Environmental Safeguards – COF Blue Plains		
Observation: The "COF - Blue Plains" DC Water data center housing multiple servers, network equipment, storage equipment, and VOIP equipment at 5000 Overlook Avenue, SW, Washington, DC is currently being cooled by a temporary air conditioning unit operating through an outside window. This type of AC unit is typically only utilized during an emergency; however it is now being run full time in order to help cool the air temperatures in the room. Based on inquiry with IT management, the temporary AC unit has experienced multiple outages in the past, therefore creating cooling issues within the data center and forcing the shutdown of various systems. **Risk:** By not implementing sufficient cooling systems in the data center, there is an increased risk of production systems overheating and being damaged by high temperatures. Data loss and disruptions to the business may occur as a result of production system damages or forced shutdown due to cooling issues.	**Recommendation:** Internal Audit recommends that DC Water management install additional AC units in the COF Blue Plains data center to allow for increased cooling capabilities and the temporary air conditioning window unit to revert back to emerge use only.	**Management's Action Plan:** IT Management agrees with the observation. Measures to address the cooling issues have been incorporated into the data center redesign project which is scheduled to begin in November of this year. It should be noted that this is a facilities project that will take at least 4 to 6 months to complete. **Implementation Date:** 5/31/2013

VII. Data Center Backup Power		
Observation: The DC Water data center located at 125 O Street, SE Washington DC is the only location that has a backup generator installed. All other data center locations rely solely on UPS systems to provide limited backup power. While it is estimated that the UPS systems could provide 45 minutes to 1 hour's worth of backup power to each data center in the event of a power outage, an extended outage would force a shutdown of DC Water systems. Based on inquiry with IT management, it was discovered that the "First Street" DC Water data center location was shut down for 3 days due to an extended power outage earlier this year. **Risk:** By not implementing a means (i.e. generator) to provide sufficient backup power to DC Water production systems, there is an increased risk that critical systems will be shutdown and unavailable during an extended power loss. The unavailability of production systems may lead to wide-spread business disruptions.	**Recommendation:** Internal Audit recommends that DC Water management conduct a cost/benefit analysis for adding more capacity to existing UPS systems and/or installing backup generators to provide power to the data centers should the regular power supply be unavailable for an extended period of time. If it is determined that the cost of additional UPS capacity and/or backup generators far outweighs the associated risk of power loss, then DC Water should ensure that a virtual (or physical with some older equipment) environment is appropriately configured at the O Street location to allow for various critical system restorations should the regular power supply be unavailable for an extended period of time.	**Management's Action Plan:** IT Management agrees with the observation and is already planning steps to increase backup power at the COF data center. Additional UPS capacity is part of the COF data center redesign project which is scheduled to begin in November of this year. IT Management will consider the cost/benefit of expanding UPS capacity at other data center locations, however it should be noted that the O Street data center has already been set up to support a sub-set of critical DC Water applications and serve as the primary backup data center for DC Water if need be. **Implementation Date:** 5/31/2013

VIII. Data Center Physical Security		
Observation: Physical access to each of the five DC Water data centers is reasonably restricted by combination lock, magnetic card readers, or keys. However, Security has not been able to readily determine which parties have been granted access to the five DC Water data centers. Furthermore, there does not appear to be any evidence of periodic access reviews being performed to ensure physical access is restricted to authorized personnel only. **Risk:** If physical access rights to the data centers are not closely monitored and reviewed on a regular basis, there is an increased risk that unauthorized access may be gained and result in adverse affects to DC Water systems and data.	**Recommendation:** Internal Audit recommends that DC Water management determine who has access to each of the five DC Water data centers and verify that all access rights are based on a valid business need. In addition, DC Water management should ensure that periodic access reviews of physical access rights to the DC Water data centers are conducted on at least a quarterly basis going forward to ensure access remains restricted to authorized personnel only. The results of each periodic review should be formally documented and retained on file for audit purposes.	**Management's Action Plan:** Facilities and Security Management agree with the observation and are currently working to upgrade DC Water's access control software, system, and protocols throughout the organization. As part of this process, all contractor and employee physical access rights are being assessed and validated. Due to limited resources, we expect this to be an on-going process that will be completed for all locations by March 30, 2013. **Implementation Date:** 3/30/2013

SC&H GROUP, LLC

dc water is life

Biosolids Operations

Internal Audit Report

October 10, 2012

INTERNAL AUDIT TEAM

Auditor:	Dominic Usher
Principal:	Dennis Fitzgerald
Director:	Joe Freiburger

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EXECUTIVE SUMMARY

Background

The DC Water Biosolids Management Program is responsible for the wastewater treatment of over two million Washington, DC metro area customers. The Program treats over 370 million gallons of wastewater every day with the potential of treating over a billion gallons in a day. The Biosolids Management Program is focused on the recycling of the wastewater materials into an environmentally safe and beneficial product that can be utilized in agriculture, silviculture and mine reclamation. DC Water's Biosolids program was certified by the National Biosolids Partnership (NBP) Environmental Management System (EMS) in 2004 and has maintained it since.

Objectives

Internal audit established four objectives for its audit of the Biosolids Operations:

- Ensuring that monthly reconciliations of the allocation of costs between DC Water and Washington Suburban Sanitary Commission (WSSC) are being performed consistently and being appropriately documented since implemented in the previous Biosolids Audit (FY2010)
- Evaluating overall effectiveness and efficiency of the Biosolids process, including checking scale calibration to ensure accuracy
- Examining the monthly Biosolids Oversight Committee Meeting minutes to identify whether any areas for concern were properly addressed
- Reviewing the prior certification report (issued by DEKRA Certification October 2011) to determine whether reportable items were sufficiently addressed.

Audit Scope and Procedures

This audit was conducted as part of the approved FY2012 internal audit plan. The audit process was initiated in July 2012 and completed in September 2012. The Audit activities included a series of inquiries of responsible parties, review of applicable reports and documents, and selected testing of transaction processes.

Summary of Work

The Biosolids Management Program at DC Water maintains a program manual which describes the Biosolids program activity and documents its mission, policies and procedures. During the examination of this manual, we noted that the manual is revised regularly and through limited observation DC Water's Biosolids program appears to be adhering to policies and procedures set forth in the manual. Based on our observations, DC Water strives to have its Biolsolids Program operating at a high level and as environmentally friendly as possible.

DC Water plans to introduce their new "digester" to create a safer and even more environmentally friendly Biosolids process while producing a higher quality product.

We examined the most recent Environmental Management System (EMS) Biosolids Audit of DC Water conducted in 2011 and inquired on the status of nonconformance items to ensure that they have been resolved. The audit is performed every 5 years and provides an indication as to DC Water's Biosolid Management Program adherence to the standards set forth by the National Biosolid Partnership (NBP). After reviewing the audit findings, we noted 4 minor nonconformance issues. We followed up on the status of those issues and determined that all had all been resolved.

There are four scales being utilized for weighing of biosolids being hauled from the Blue Plains location. We identified that all scales are calibrated, at a minimum, on an annual basis. We verified that documentation was maintained evidencing the calibration within the previous 12 months.

Biosolid workgroup meetings are held on a monthly basis. One of the items identified within the most recent EMS Biosolid Audit was that the minutes of the meetings were insufficient to capture the content of the meetings. We reviewed the minutes for the previous six months and noted that they were complete, detailed, and sufficiently captured the contents of the discussions. Additionally we verified that any noted items within the minutes were being properly addressed and resolved as indicated in subsequent meeting minutes.

We examined the most current Biosolids hauling contract with NutriBlend to ensure that the contractors were adhering to the appropriate rules and regulations. After reviewing the contract, we noted that the contractors were adhering to the appropriate rules and regulations, holding the necessary hauling permits and maintaining the Certified Nutrient Management Planner to ensure Biosolids meet conformance standards.

Finally, Internal Audit examined the Biosolids monthly reconciliations pertaining to WSSC to ensure that the reconciliations are being performed consistently and accurately. We noted that the reconciliations were not being performed on a monthly basis but on an annual basis due to understaffing. Management hires a contractor at the end of the fiscal year to perform the reconciliation process and recommended to continue to perform them annually. Through review of the previous 12 months of reconciliations we identified little to no reconciling items. Additionally through discussion with individuals responsible for performing the reconciliations, we determined that performing them at year end at the same time that (WSSC) performs their year-end true-up facilitates the efficiency in performing the reconciliations. We concluded that the timing of the performance of the reconciliation is sufficient.

Internal Audit does not have any detailed audit observations and recommendations to report.

We thank management of the cooperation extended during the course of the audit.

SC&H Consulting

By:

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Joe Freiburger, CPA, CIA