



# CITY OF SAN ANTONIO

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*October 31, 2012*

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**Carlton Soules**  
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**SUBJECT: Audit Report of Building and Equipment Services – Fuel Inventory Management**

Mayor and Council Members:

We are pleased to send you the audit report of Building and Equipment Services – Fuel Inventory Management. This audit began in January 2012 and concluded with an exit meeting with department management in September 2012. Management's verbatim response is included in Appendix D of the report. Building and Equipment Services should be commended for its cooperation and assistance during this audit.

The Office of the City Auditor is available to discuss this report with you individually at your convenience.

Respectfully submitted,

Kevin W. Barthold, CPA, CIA, CISA  
City Auditor  
City of San Antonio

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**CITY OF SAN ANTONIO**  
**OFFICE OF THE CITY AUDITOR**



Audit of Building and Equipment Services  
Fuel Inventory Management

Project No. AU12-012

October 31, 2012

Kevin W. Barthold, CPA, CIA, CISA  
City Auditor

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## Executive Summary

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As part of our annual Audit Plan, we conducted a fuel inventory management audit of the Building and Equipment Services Department, Fleet Services Division (hereafter referred to as "Fleet"). This audit follows our 2009 review of selected Fleet activities. The audit objective, conclusion, and recommendations follow:

### **Have adequate controls been implemented in the Fleet fuel inventory system?**

No. Controls over the Fleet fuel inventory system are not adequate. Specifically,

- Fleet had not established adequate fuel operations management oversight.
- The automated fuel management system was not always properly monitored/maintained, potential fuel leakage was not reported to the Texas Commission on Environmental Quality (TCEQ), and City fuel sites were not maintained to industry standards and TCEQ required levels.
- Fuel inventory accountability was lacking. Fleet had no assurance the correct tank charts were used to measure and inventory fuel tanks, and identified variances between inventoried volumes and volumes reflected in the automated fuel management system were not investigated, reconciled, and corrected.
- Errors in financial reporting of fuel inventories created a \$25,797 overstatement (based on Fleet's fuel valuation of \$650,927) in the City's SAP financial system. Fleet did not inventory all fuel, manual clerical errors were made, the method used to compute end-of-year fuel inventory was flawed, tank water was improperly included in the fuel valuation, and the end-of-year inventory was reported without adjusting to temperature compensated levels.
- Not all fuel sites were equipped with surveillance equipment.

We made 12 recommendations to Building and Equipment Services to strengthen and improve fuel inventory controls.

Management's verbatim response is in Appendix D on page 16.

## Table of Contents

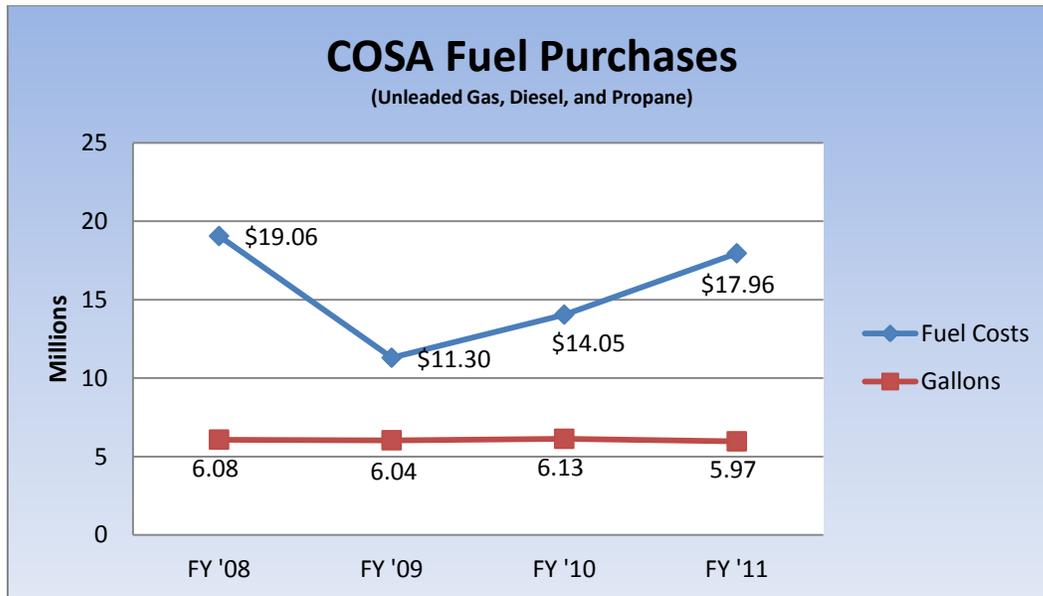
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Executive Summary .....	i
Background.....	1
Audit Scope and Methodology .....	3
Audit Results and Recommendations .....	4
A. Fuel Operations Management Oversight .....	4
B. Automated Fuel Management System.....	5
C. Fuel Inventory Accountability.....	8
D. Financial Reporting.....	10
E. Fuel Site Surveillance Equipment .....	12
Appendix A – Tank Volume Variances.....	13
Appendix B – FY 2011 Year-End Fuel Inventory Reconciliation .....	14
Appendix C – Staff Acknowledgement.....	15
Appendix D – Management Response .....	16

## Background

The Fleet Services Division (a.k.a. “Fleet”) of the Building and Equipment Services Department provides fuel for approximately 4,750 City of San Antonio (COSA) vehicles. Fleet also provides fuel on a reimbursable basis to other local government entities with which COSA has an agreement (Bexar County, San Antonio Housing Authority, and Lackland Independent School District).

To provide this support, Fleet purchases unleaded gasoline, diesel, and propane fuel for 12 COSA fueling sites throughout San Antonio. Fleet also provides fuel for Fire Station 36 and five backup diesel generators. Although costs have fluctuated substantially, fuel purchases (in gallons) over the past four fiscal years have remained relatively constant as shown below (these amounts do not include fuel purchased<sup>1</sup> by the San Antonio Fire Department (SAFD) using Valero fuel cards):



Both the Environmental Protection Agency (EPA) at the federal level, and Texas Commission on Environmental Quality (TCEQ) at the state level, establish rules and regulations related to above ground and underground fuel storage tanks. Specifically, both agencies issue criteria for managing, maintaining, and inventorying fuel.

TCEQ, under Texas Administrative Code Chapter 334, establishes mandates for pressurized fuel tank leak detectors and requires fuel tanks to be tested at least once per year for performance and operational reliability.

<sup>1</sup> The SAFD purchased an estimated 640,000 gallons of fuel at Valero stations during fiscal year 2011.

Fleet utilizes five information systems: Veeder-Root, Inform, FuelView, Faster, and SAP. Fuel sales transactions from FuelView are manually transferred into Faster and again manually transferred from Faster into SAP. A brief explanation of each system follows:

**Veeder-Root:** A full-range of fuel gauges and reporting mechanisms that continuously measure fuel, water, and temperature levels in storage tanks and fuel lines. This system also provides real-time fuel leak notifications. Additionally, on a daily and monthly basis, the system collects all fuel transactions (sales and deliveries), providing a perpetual inventory system for each fuel tank to aid in identifying potential fuel leaks.

**Inform:** The Inform system provides for the automated and centralized historical collection of inventory, leak detection, and diagnostic information by polling sites equipped with Veeder-Root tank gauges. This system is comprised of electronic gauges that monitor fuel levels of the fuel tanks located throughout the City.

**FuelView:** This E.J. Ward application captures daily fuel sales transactions at the dispenser (gas pump). The user must enter his/her personnel number and insert the gas nozzle into the car's gas tank to activate the fuel dispenser. Fuel cannot be dispensed without either a canceiver-equipped<sup>2</sup> vehicle or a fuel swipe key. Additionally, the canceiver captures vehicle information including mileage readings. Sales transactions are automatically exported daily to a flat file which then Fleet manually transfers into FASTER.

**Faster:** The FASTER system was installed in 1996 to track vehicle, equipment, parts, work orders, and fuel sales. The system generates various reports for daily operations management. After daily fuel transactions are uploaded into Faster, fuel pricing and service charges are established based on current Oil Price Information Service (OPIS) pricing. This system is used to generate summarized monthly billing flat files, by department, which are then manually entered into SAP.

**SAP:** SAP is used for accounting and financial reporting. The monthly flat files of summarized transactions are manually posted by department into SAP. Outside entities are billed on a monthly basis. The SAP system is also used to generate purchase orders for fuel vendors and issue payments based on fuel invoices.

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<sup>2</sup> The canceiver consists of a small onboard computer and radio frequency (RF)-gas tank receiver. The RF-gas tank receiver authenticates the vehicle while the canceiver computer communicates operating details (odometer reading, miles per gallon computation, tire pressure, etc.). Fuel swipe keys are issued for vehicles that do not have an installed canceiver. Swipe keys require the user to input his/her employee number prior to authorizing fuel dispensing.

## Audit Scope and Methodology

The audit scope covered fuel operations and transactions from October 2010 to March 2012. In some cases, however, more current data was used.

We interviewed Fleet management personnel to gain an understanding of fuel ordering, delivery, issue, inventory control, and payment processes. To better understand the inventory process, we observed the March 31, 2012 physical inventory conducted by Fleet personnel. We observed fuel deliveries and vehicle fueling at various City fuel sites. We traced physical inventory results from Fleet Fiscal Operations documentation to the City's SAP financial system. Using data analysis software, we tested completeness of data by comparing sales transactions from the FuelView system to records in FASTER and ultimately to the City's SAP accounting system.

The basis for our tests included criteria established in EPA and TCEQ regulations and publications, City administrative directives, Fleet policies and procedures, contractual agreements, and OPIS fuel pricing publications.

We relied on computer-processed data in the Veeder Root, Inform, FuelView, FASTER, and SAP data systems to trace transactions through various control mechanisms. Our reliance was based on performing direct tests of the data rather than evaluating the system's general and application controls. We do not believe that the absence of testing general and application controls had an effect on the results of our audit.

The scope of our audit included Fleet's diesel and unleaded fueling process controls. We did not review:

- San Antonio Fire Department's use of Valero fuel cards to purchase fuel from third-party retail vendors
- Fuel dispensed from the Fire Station No. 36 fuel tank
- Fuel dispensed from Fleet's tanker trucks that are used to fuel equipment and vehicles at remote sites
- Propane transactions (purchasing, sales, dispensing, and inventory)

We conducted this audit from January to July 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our audit results and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our audit results and conclusions based on our audit objectives. Our audit included tests of management controls that we considered necessary under the circumstances.

## Audit Results and Recommendations

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### A. Fuel Operations Management Oversight

Fleet has not established adequate fuel operations management oversight.

As described in sections B, C, D, and E that follow, Fleet did not have adequate procedures for performing:

- fuel leak detection testing
- TCEQ reporting
- fuel inventory accounting and reporting
- fuel site maintenance and surveillance

Also, Fleet did not have plans in place to comply with a newly mandated TCEQ training regulation. In February 2011, TCEQ adopted changes to Chapter 334 related to operator training requirements for individuals involved with underground storage fuel tanks. TCEQ's focus is to enhance the protection of the state's groundwater and surface water resources from environmental contamination that could result from releases of harmful substances, and to minimize threats to human health and safety which could result from the improper operation of an underground storage tank facility. The changes, effective March 2011, mandated specific training required to be completed by August 8, 2012. We determined that Fleet personnel were unaware of the TCEQ training requirement as of late June 2012 -- however, once we notified Fleet of this requirement they immediately took action to identify and schedule the necessary training.

Managing fuel operations strategically is not only essential for daily operations, but also for long-term sustainability of the City's fuel and related storage and dispensing resources. The few individuals in Fleet's fuel management group are focused primarily on daily operations -- monitoring fuel levels, ordering and receiving fuel, and keeping fuel dispensing equipment operational. However, little attention has been given to longer-term sustainability of fuel operations.

### Recommendation

The Building and Equipment Services Director should assign a manager to provide fuel operations oversight. Responsibilities should include providing a long-term, strategic focus on the City's fuel operations.

## **B. Automated Fuel Management System**

Fleet did not properly monitor or maintain the City's fuel management system.

We determined that Fleet did not: a) test and calibrate all fuel tank leak detection equipment (the Veeder-Root system) as required; b) report potential tank leakage to TCEQ; or c) maintain all City fuel sites to meet TCEQ, American Petroleum Institute (API), and National Fire Code standards.

Fleet uses an automated fuel management system to measure/monitor fuel, water, and temperature in each fuel tank and to identify any significant changes which represent potential fuel leaks. The Veeder-Root and Inform systems work together to routinely test fuel tank pressure, measure fuel levels, and provide daily and monthly perpetual inventory reports to assist in fuel tank/line leak detection. The fuel management system is also an effective control for measuring and managing the City's vehicle fuel usage.

If the fuel management system is not properly monitored or maintained, fuel tank and fuel line leakage may go undetected for long periods of time (a potential environmental hazard); fuel inventory accountability is lost; and the potential for undetected theft, fraud and waste increases significantly.

### **Fuel Tank Leak Detection**

Fleet did not perform annual fuel tank leakage testing and calibration necessary to ensure effective fuel leak detection.<sup>3</sup> Specifically, of the City's 12 fueling sites,<sup>4</sup> we found three sites; San Antonio Police Department (SAPD) Patrol South Substation, SAPD Patrol Northwest Substation, and the Airport Maintenance Facility; had not been tested. Without periodic testing and calibration, City management has no assurance fuel leaks will be quickly detected, potentially resulting in serious environmental hazards.

### **TCEQ Reporting**

Fleet did not comply with TCEQ reporting requirements. EPA's publication 510-B-93-004 outlines inventory control procedures designed to meet EPA fuel leak detection requirements. It delineates procedures necessary to maintain effective inventory control and also provides reporting requirements when potential fuel leaks are detected. Two measurements are used to determine a potential fuel leak. First, Veeder-Root determines the volume of fuel in each tank using its internal measurement system. Second, the Veeder-Root calculates the volume of

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<sup>3</sup> Texas Code, Title Administration 30, Part 1, Chapter 334, Subchapter C, Section 334.5(b)(2)(A)(i)(III) states, "The line leak detector shall be tested at least once per year for performance and operational reliability and shall be properly calibrated and maintained,..."

<sup>4</sup> Brooks City-Base refueling site did not come under the Fleet's responsibility until mid-2011 and was not included in this evaluation.

fuel in each tank based on inventoried amounts, deliveries, and sales. When the difference between these two numbers exceeds one percent of monthly sales plus 130 gallons for two consecutive months, the appropriate regulatory agency (in this case, TCEQ) must be notified. In addition to the required reporting, corrective action must also be documented and submitted with the reporting documentation.

Using February 2011 and August 2011 as baseline months, we calculated the variance for all City fuel tanks and identified those tanks whose variances exceeded the EPA threshold of one percent of monthly sales plus 130 gallons. We further determined whether any of the variances occurred for two consecutive months or more which requires TCEQ reporting and corrective action. We found eight tanks whose variances exceeded the EPA threshold; Fleet neither reported the discrepancies to TCEQ nor initiated corrective actions. For example, at the Northwest Service Center, tank #3 exceeded the EPA threshold for eight consecutive months without being reported to TCEQ. We found no evidence of corrective actions taken to determine if there were leaks or other problems. The table below identifies the eight tanks and number of consecutive months the EPA threshold was exceeded where Fleet did not perform the required TCEQ reporting.

Location	Tank Number	# Of Consecutive Months EPA Threshold Was Exceeded With No Corresponding TCEQ Reporting
Northwest Service Center	3	8
Southeast Service Center	1	5
Zarzamora Service Center	3	5
Northwest Service Center	4	4
Patrol Southeast Substation	2	4
Northwest Service Center	1	2
Northwest Service Center	2	2
Patrol North Substation	2	2

Table 1. Fuel Tanks Exceeding EPA/TCEQ Reporting Thresholds

### Fuel Site Maintenance

In response to our previous audit, Fleet contracted with a local contractor to inspect the City’s fuel sites. The final reports issued by the contractor identify numerous deficiencies throughout the City’s fueling sites; some not meeting API standards, others violating TCEQ regulations and/or National Fire Codes. Although the inspections were completed in mid-2009, Fleet could not provide documented evidence that any corrective actions had been taken. Examples of observations made during the 2009 inspections are shown below in **Table 2**.

<b>Fuel Site Location</b>	<b>Category</b>	<b>Comments</b>
Downtown Police Headquarters	Overfill Protection	"Site has no drop tubes. Per TCEQ requirements, you need drop tubes to prevent static electricity."
Downtown Police Headquarters	Tank Spill Containment Sumps	"All existing sumps are not watertight. Gas tank has 8" of water in sump. Diesel tank has 20" of water in sump. Thus these sumps will not contain spills or keep water out. All sumps need to be replaced."
Emergency Operations Center	Tank Spill Containment	"This pipe is bar steel and needs cathodic protection to be in compliance with TCEQ."
Fire Station #36	Tank Fill Spill Containment	"Manhole needs to be painted to meet API standards."
Fire Station #36	Fuel Dispenser	"The existing fuel dispenser has flexible rubber conduits under the fuel dispenser. This is in violation of National Fire Code."
Northeast Service Center	Tank Fill Spill Containment	"Diesel tank has a busted fill spill container. Needs to be replaced ASAP."
Northwest Service Center	Tank Fill Spill Containment	"Manhole needs to be painted to meet API standards."
Northwest Service Center	Waste Oil tank	"This area is a mess and has several TCEQ violations."

Table 2. Contractor Fuel Site Inspection Observations

### **Recommendations**

The Building and Equipment Services Director should:

B.1. Strengthen procedures to ensure fuel tank management systems are tested/calibrated annually as required by law.

B.2. Ensure that Fleet reports all fuel inventory variances that exceed the EPA threshold to TCEQ as required.

B.3. Re-inspect all City fuel sites and correct deficiencies giving priority to those violating TCEQ rules, API standards, and fire codes.

## C. Fuel Inventory Accountability

Fleet did not use correct tank charts or reconcile/investigate fuel variances.

If procedures are not in place to use correct tank charts and reconcile fuel variances during the physical inventory process, potentially significant errors in reported fuel inventories could result.

### Tank Charts

Fleet used incorrect tank charts when calculating fuel inventories. This issue was also reported in our previous audit. Regarding the inspections of the City's fuel sites conducted by a local contractor in 2009 and discussed in section B above, attempts were made by the local contractor to identify the manufacturer of each fuel tank and applicable fuel tank measurement chart. Using the results of the 2009 inspections, we determined that tank charts for only 14 of 32 tanks could be confirmed. Consequently, the Fleet has no assurance that results of its quarterly physical inventories are based on the correct measurement chart and therefore accurate. One example we identified during the audit was the year-end physical inventory of Tank #1 at the City's SAPD Patrol South Substation. Using a dipstick, Fleet personnel measured 56.75 inches of fuel. Fleet personnel then converted the 56.75 inches to 7,593 gallons of fuel using the assigned tank chart. However, when the converted volume of 7,593 gallons was compared to the automated fuel management system's reported volume of 6,565 gallons, a variance of over 1,000 gallons (almost 14 percent of the inventoried amount) was identified.

In discussions with the City's Veeder-Root vendor, Fleet learned that the fuel management system has the ability, using its internal tank calibration algorithm, to create its own measurement chart for each fuel tank (a function called Accu-Charts). This tank calibration algorithm collects and analyzes fuel level data over a 56-day period to ultimately generate an accurate tank chart. Assuming original tank charts cannot be found, Fleet's use of Accu-Charts would result in more accurate fuel measurements.

### Fuel Variance Reconciliation

Fleet did not properly reconcile and investigate fuel variances. Fuel variances are considered routine in day-to-day operations. However, good business practices require a variance threshold be established, for example one percent of fuel throughput. If the variance exceeds the established threshold, it should be thoroughly investigated and corrective action should be taken.

- Physical Inventory Reconciliations: We performed a review of Fleet's FY 2011 year-end (September 30, 2011) physical inventory. Of the 32 fuel tanks inventoried, we determined that 24 exceeded a one-percent variance between the physically inventoried tank volumes and the Veeder-Root

computed tank volumes. Of those exceeding one percent, we found 12 tanks with variances exceeding three percent, ranging from 3.2 percent up to 13.5 percent. **Appendix A** lists the 12 tanks and related variances. We could find no documented policies or procedures establishing variance thresholds or outlining actions to take when such variances are found.

- **Fuel Delivery Variances:** For the period October through December 2011, we calculated the variance for all fuel deliveries made to two service centers, Zarzamora and the Northeast Service Centers. Of the 32 deliveries made to these two fueling centers,<sup>5</sup> 19 (about 60 percent), resulted in variances exceeding one percent. Variances ranged as high as four percent. Because of mathematical errors made by Fleet in the variance computation, none of the discrepancies was referred to the Fleet Acquisition Manager (or any other manager) for evaluation and corrective action in compliance with established Fleet procedures described below.

For fuel deliveries, Fleet has established procedures addressing variances between volumes delivered per the automated Veeder-Root fuel system with the volumes reflected on the fuel vendor's bill of lading. Specifically, these procedures state that "Discrepancies over/under 1% of the delivery are to be reported to Fleet Acquisition Manager." Three actions are required by the Fleet Acquisition Manager:

- "A request for tank calibration will be ordered immediately upon notification of the delivery.
- Fuel Operations personnel will generate a Notice of Delivery Discrepancy to vendor.
- Reconciliation procedures will follow according to vendor discrepancy procedures."

## Recommendations

The Building and Equipment Services Director should:

C.1. Initiate actions for the Veeder-Root system to develop its own tank charts for all fuel tanks with unconfirmed tank charts.

C.2. Require all variances between delivered fuel volumes per bills of lading and volumes delivered per the automated Veeder-Root fuel management system be calculated and corrective action taken when variances exceed one percent.

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<sup>5</sup> During the period October through December 2011, 20 deliveries were made to the Zarzamora Service Center and 12 were made to the Northeast Service Center

## D. Financial Reporting

Fleet did not accurately report the FY 2011 year-end fuel inventory.

For the September 30, 2011 fiscal year-end fuel inventory, Fleet did not: a) include all fuel the City had on-hand; b) transfer properly all fuel volumes from individual tank worksheets to a summary spreadsheet; c) calculate accurately the lower of average cost or market fuel valuations; d) consider accumulated tank water as a reduction to recorded fuel volumes; and e) compensate fuel volumes for temperature variances. Accounting for all errors above, the year-end fuel dollar value was overstated by \$25,797 (see Appendix B). A brief explanation of each issue follows:

a. Incomplete Physical Inventories: For end-of-year inventory, Fleet personnel inventoried the fuel in only four of seven fuel trucks; inappropriately excluding fuel in three of the trucks. In addition to the 12 fuel sites located throughout San Antonio, the City also maintains seven fuel trucks that transport fuel (diesel/unleaded gas) to vehicles/equipment, such as bulldozers and weed trimmers, rather than transport the vehicles and equipment to the City's fuel sites for refueling. For inventory purposes, accountability for the fuel in the fuel trucks remains with Fleet until the fuel is pumped into other vehicles and equipment. When fuel inventory is taken by Fleet, the amount of fuel in the fuel trucks should be captured and included in Fleet's inventory. Assuming the three fuel trucks were completely full, the inventory value would have been underreported by about \$10,270 (3,250 gallons \* \$3.16/gallon).

b. Clerical Errors: Clerical errors were made transferring fuel volumes from individual tank worksheets to a summary spreadsheet used to calculate the ending inventory.

c. Lower of Average Cost or Market: Fleet did not use the proper fuel inventory valuation method for FY 2011 ending inventory. Average cost is computed by aggregating the cost for all fuel purchases over the year and dividing that number by the number of gallons purchased over the same time period (e.g. unleaded gas average cost is computed as \$10,585,944 ÷ 3,584,493 gallons = \$2.95/gallon). Market price is determined by the OPIS price effective on the last day of the fiscal year (e.g. unleaded gas was \$2.90/gallon). Fleet did not use either of these values for valuing the FY 2011 ending fuel inventory (e.g. Fleet used \$2.91 for unleaded fuel). Similar errors were made determining average cost and market cost for diesel fuel. Consequently, the year-end fuel inventory valuation was distorted.

d. Water: Fleet did not consider accumulated tank water as a reduction to recorded fuel volumes. Occasionally, fuel tanks accumulate water which settles to the bottom of the tank. For physical inventory purposes, care is required to exclude water volumes when calculating a tank's fuel volume. Unless the water content is

used to reduce year-end inventory, the water (in gallons) will be improperly counted as fuel resulting in an overstatement of the fuel dollar value. We noted that at the Northwest Service Center, the Veeder-Root system measured 193 gallons of water in two fuel tanks. However Fleet did not reduce the total fuel volume by 193 gallons to account for the water. In total, Fleet did not reduce fuel inventory by 468 gallons of accumulated tank water.

e. Temperature Compensation: Fleet did not compensate fuel volumes for temperature variances above 60 degrees Fahrenheit (F). We determined that unleaded fuel temperatures ranged from 83.4 °F to 93.6 °F and diesel fuel temperatures ranged from 88 °F to 102 °F when the year-end physical inventory was taken. To accurately compute the City's volume of fuel for inventory valuation purposes, the fuel's volume should be adjusted ("compensated") to 60°F, the temperature at which it was priced when purchased.

As fuel heats up, its volume expands, meaning a gallon of fuel stored at warm temperatures contains more volume than one stored at colder temperatures. The reference temperature for petroleum products in the United States is 60 °F. One gallon of unleaded gasoline at 60 °F would measure 231 cubic inches. The same gasoline measured at 80 °F would measure 233.7 cubic inches. In simpler terms, every 15-degree increase in temperature increases the volume by about one percent for unleaded fuel and about .6 percent for diesel fuel. The City purchases fuel based on 60° F temperature compensated volumes; accordingly fuel should be valued at year-end based on 60 °F.

The City adheres to Governmental Accounting Standard Board (GASB) accounting standards which require inventories be valued properly. Errors in the fuel inventory and valuation process lead to distorted values reported in the City's SAP financial system.

## **Recommendations**

The Building and Equipment Services Director should:

- D.1. Include fuel held in all fuel trucks when reporting ending physical inventory.
- D.2. Develop a review process to reduce errors in the physical inventory process.
- D.3. Properly calculate and select either the lower of average cost or the market price valuation method<sup>6</sup> for ending fuel inventory valuations.
- D.4. Properly reduce recorded tank fuel volumes by accumulated tank water identified when taking physical inventories.

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<sup>6</sup> Alternatively, the first-in, first-out method may be used under Government Accounting Standards Board (GASB) accounting.

D.5. Adjust ending inventories to temperature compensated levels when computing the year-end dollar value of fuel.

### **E. Fuel Site Surveillance Equipment**

Fleet does not have adequate surveillance equipment to monitor all COSA fueling sites.

This condition was also reported in our 2009 audit report. In that report, only two of COSA's 11 fueling sites at the time had working surveillance cameras and surveillance media was limited to two months. Currently, Fleet has cameras in five fueling sites but retains media for just two weeks.

In its action plan in response to the 2009 audit, Fleet's intent was to address the feasibility of installing surveillance equipment at all City fueling sites. Our concern at the time was the method used by employees for refueling City vehicles; a card system required City employees to swipe a fuel card prior to dispensing fuel. However, with the fuel card, the system allowed City employees to dispense fuel into any vehicle, including non-city vehicles, significantly increasing the potential for fraudulent use. The City has since implemented the current automated fuel system which has better controls.

As part of the automated fuel management system, Fleet installed (in most but not all City vehicles) a device that interfaces with the fuel dispensing system via a radio signal. The "canceiver" device<sup>7</sup> is installed in close proximity to the gas tank opening and communicates with the fuel pump when the pump nozzle is inserted into the fuel tank opening. Without the canceiver electronic interface, no fuel can be dispensed. We believe this change is a significant deterrent to fuel theft.

But, as mentioned above, not all City vehicles have a canceiver installed. When vehicles without a canceiver require fuel, the driver must use a fuel swipe key at automated City fuel sites. The swipe key, however, could allow individuals to fraudulently obtain fuel for non-City vehicles. To reduce the potential for fuel theft, camera surveillance can be an effective tool.

#### **Recommendation:**

The Building and Equipment Services Director should install surveillance cameras at all COSA fueling sites. Surveillance media should be retained for at least six months.

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<sup>7</sup> The canceiver device consists of a small onboard computer and radio-frequency (RF)-gas tank receiver. The RF-gas tank receiver authenticates the vehicle while the canceiver computer communicates operating details (odometer reading, miles per gallon computation, tire pressure, etc.).

## Appendix A – Tank Volume Variances

<b>Variances Between Veeder-Root and Physical Inventory Volumes<sup>1</sup></b>							
No.	Fueling Site - Tank	Physical Depth per Dipstick (Inches) <sup>2</sup>	Depth per Veeder-Root <sup>3</sup> (Inches)	Volume per Tank Calibration Chart <sup>4</sup> (Gallons)	Volume per Veeder-Root <sup>3</sup> (Inches)	Auditor Calculated Absolute Variance <sup>5</sup> (Gallons)	% Variance from Tank Calibration Chart Volume
1	Airport Maintenance Facility – Unleaded <sup>6</sup>	67.875	67.34	7,675	7,425	250	3.3%
2	Northwest Service Center – Diesel	47.875	47.57	6,274	6,496	222	3.5%
3	Zarzamora Service Center – Diesel <sup>6</sup>	27.75	27.26	2,941	2,846	95	3.2%
4	Downtown Police Station - Unleaded	53.50	54.24	6,998	7,500	502	7.2%
5	Northeast Service Center - Diesel	51.50	51.97	8,192	8,483	291	3.6%
6	Emergency Command Center - Diesel	58.50	58.07	3,665	3,420	245	6.7%
7	Patrol South Substation – Unleaded <sup>6</sup>	56.75	55.64	7,593	6,565	1,028	13.5%
8	Patrol South Substation – Unleaded <sup>6</sup>	63.0	63.01	8,561	7,779	782	9.1%
9	Patrol Northwest Substation – Unleaded <sup>6</sup>	53.50	55.03	7,187	7,510	323	4.5%
10	Police Academy - Unleaded	39.75	39.32	4,767	5,064	297	6.2%
11	Patrol East Substation – Unleaded <sup>6</sup>	58.0	58.30	7,917	8,297	380	4.8%
12	ITSD - Diesel	30.50	30.44	725	682	43	5.9%

<sup>1</sup>This chart includes only tanks showing a variance larger than three percent. As reported in our previous audit report (AU08-006), Fleet still had no trigger point for investigating variances during our scope period.

<sup>2</sup>Fleet staff, in the presence of auditors, took physical dipstick measurements on September 30, 2011.

<sup>3</sup>Source: Fleet provided Veeder-Root tapes concurrent with the dipstick measurements. Veeder-Root tapes provide a real-time set of measurements including depth and volume. These measurements are based on data from the Veeder-Root tank gauges and exclude any water measured by the Veeder-Root system.

<sup>4</sup>Source: Fleet provided the tank calibration charts. Auditors used the physical depth as measured by a dipstick to identify the corresponding volume on the tank calibration charts.

<sup>5</sup> This represents the difference between the Veeder-Root volume and the volume per the calibration chart. The absolute value displays all amounts as positive numbers.

<sup>6</sup> The local contractor that performed the fuel site inspections could not confirm the accuracy of the tank chart used by Fleet to convert inches to gallons.

## Appendix B – FY 2011 Year-End Fuel Inventory Reconciliation

COMPONENT	UNLEADED	DIESEL	TOTAL
<b>Ending Inventory Calculated by Fleet</b>			
FY 2011 Ending Inventory (Gallons) (Diesel & Unleaded Fuel)	127,648	89,574	
Lower of Average Cost or Market per Fleet	\$2.91	\$3.12	
<b>FY 2011 Ending Inventory Value per Fleet</b>	<b>\$371,456</b>	<b>\$279,471</b>	<b>\$650,927</b>
<b>Ending Inventory Calculated by Auditors</b>			
FY 2011 Ending Inventory (Gallons) per Fleet	127,648	89,574	
Add: Maximum Capacity for Fuel not counted in 3 of 7 Fuel Trucks		3,250	
Subtract: Water in tanks	(85)	(383)	
Subtract: Fleet Clerical Errors	2,969	(11,163)	
Subtract: Temperature Compensation	(2,506)	(944)	
Auditor Calculated Ending Inventory Volume (Gallons)	128,026	80,334	
<b>Lower of Average Cost or Market per Audit</b>	<b>\$2.90</b>	<b>\$3.16</b>	
<b>FY 2011 Ending Inventory Value per Audit</b>	<b>\$371,275</b>	<b>253,855</b>	<b>\$625,130</b>
<b>Estimated Ending Inventory Overstatement</b>			<b>\$25,797</b>

## Appendix C – Staff Acknowledgement

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Mark Bigler, CPA-Utah, CISA, CFE, Audit Manager  
Phillip Gaddy, CPA, Auditor in Charge  
Matthew Howard, CISA, Auditor  
Alejandro Valadez, CISA, Auditor

## Appendix D – Management Response



# CITY OF SAN ANTONIO

SAN ANTONIO TEXAS 78283-3966

October 24, 2012

Kevin W. Barthold, CPA, CIA, CISA  
 City Auditor  
 San Antonio, Texas

RE: Management's Corrective Action Plan for the Audit Fuel Inventory Management

Building and Equipment Services has reviewed the audit report and has developed the Corrective Action Plans below corresponding to report recommendations.

Recommendation					
#	Description	Audit Report Page	Accept, Partially Accept, Decline	Responsible Person's Name/Title	Completion Date
A	<p><b>Fuel Operations Management Oversight</b></p> <p>The Building and Equipment Services Director should assign a manager to provide fuel operations oversight. Responsibilities should include providing a long-term, strategic focus on the City's fuel operations.</p>	4	Accept	<p>Jorge A. Perez/Director Building and Equipment Services</p> <p>Robert Stanton/Assistant Director Building and Equipment Services</p>	Completed (September 2012)
<p><b>Action plan:</b></p> <p>As part of the FY 2013 budget, a management analyst position was approved to assist with fuel operations and TCEQ compliance. In addition an Assistant Director for Building and Equipment Services has been hired to assist with Fleet Services and this position is actively involved in the management of fuel operations. The Department will continue to explore efficiencies and evaluate opportunities for improvement.</p>					

Recommendation					
#	Description	Audit Report Page	Accept, Partially Accept, Decline	Responsible Person's Name/Title	Completion Date
B	<b>Automated Fuel Management System</b>	5	Accept	Jorge A. Perez/Director Building and Equipment Services  Robert Stanton/Assistant Director Building and Equipment Services	The Building and Equipment Services Director should:
	B.1. Strengthen procedures to ensure fuel management systems are tested/calibrated annually as required by law.				Completed (September 2012)
	B.2. Ensure that Fleet reports all fuel inventory variances that exceed the EPA threshold to TCEQ as required.				Completed (September 2012)
	B.3. Re-inspect all City fuel sites and correct deficiencies giving priority to those violating TCEQ rules, API standards, and fire codes.				December 2012 (Complete Plan)  October 2013 (Address Improvements)
<p><b>Action plan:</b></p> <p><b>B.1</b> Building and Equipment Services tests and calibrates all fuel management system equipment as required by law. Fuel tanks are to be tested/calibrated annually and generators every three years. At the time of the audit, only one fuel tank location had not had the annual testing/calibration completed and the testing was completed in September 2012. To ensure locations do not miss calibration deadlines, a report will be provided to Department Executive Management quarterly. Staff will research options of combining current maintenance contracts for the fuel management system equipment with the testing/calibration contract.</p> <p><b>B.2</b> Staff currently compiles monthly inventory reports for all fuel tanks to monitor fuel variances reported by the tank monitoring system. Staff will document each month if the variance exceeds one percent plus 130 gallons and what action is taken. If the variance is present at the same tank location for two consecutive months TCEQ will be notified and appropriate action taken.</p> <p><b>B.3</b> Building and Equipment Services is in the process of updating fuel site assessments to determine if improvements to fuel sites are needed. Once the assessments are completed, staff will review the recommendations and develop a plan to address recommendations. A plan to address recommendations will be developed by December 2012.</p>					

Recommendation					
#	Description	Audit Report Page	Accept, Partially Accept, Decline	Responsible Person's Name/Title	Completion Date
<b>C</b>	<p><b>Fuel Inventory Accountability</b></p> <p>The Building and Equipment Services Director should:</p> <p>C.1. Initiate actions for the Veeder-Root system to develop its own tank charts for all fuel tanks with unconfirmed tank charts.</p> <p>C.2. Require all variances between delivered fuel volumes per bills of lading and volumes delivered per the automated Veeder-Root fuel management system be calculated and corrective action taken when variances exceed one percent.</p>	<b>8</b>	Accept	<p>Jorge A. Perez/Director Building and Equipment Services</p> <p>Robert Stanton/Assistant Director Building and Equipment Services</p>	<p style="text-align: center;">March 2013</p> <p style="text-align: center;">Completed (September 2012)</p>
<p><b><u>Action plan:</u></b></p> <p><b>C.1</b> Building and Equipment Services has confirmed tank charts for 20 of the 32 fuel tanks for the City. To address the 12 fuel tanks with unconfirmed tank charts, staff will utilize the Accu Chart fuel tank charting feature to confirm the tank charts for the unconfirmed locations.</p> <p><b>C.2</b> Computations have been corrected to correctly calculate variances between bills of lading and volumes delivered. In addition check and balances have been put in place to have both fuel operations and fiscal calculate the variances to ensure calculations are completed correctly. In instances where variances are +/- 1%, staff will investigate and appropriate action taken.</p>					

<b>Recommendation</b>					
#	Description	Audit Report Page	Accept, Partially Accept, Decline	Responsible Person's Name/Title	Completion Date
<b>D</b>	<b>Financial Reporting</b>	<b>10</b>	Accept	Jorge A. Perez/Director Building and Equipment Services	October 2012
	D.1. Include all fuel held in fuel trucks when reporting ending physical inventory.				January 2013
	D.2. Develop a review process to reduce errors in the physical inventory process.				October 2012
	D.3. Properly calculate and select either the lower of average cost or the market price valuation method <sup>1</sup> for ending fuel inventory valuations.				October 2012
	D.4. Properly reduce recorded tank fuel volumes by accumulated tank water identified when taking physical inventories.				October 2012
	D.5. Adjust ending inventories to temperature compensated levels when computing the year-end dollar value of City fuel.			Robert Stanton/Assistant Director Building and Equipment Services	October 2012
<p><b><u>Action plan:</u></b></p> <p><b>D.1</b> Annual physical inventories will be conducted on all fuel sites and mobile fueling units. This process will be used for end of year inventory for FY 2012.</p> <p><b>D.2</b> Physical inventories will be completed on a monthly basis initially to document the integrity of the new process. Once the inventory process has been documented, inventories will be completed on a biannual basis.</p> <p><b>D.3</b> The First-in First-out (FIFO) method will be used to value fuel inventory. FIFO will provide a more accurate figure than the Lower of Average Cost or Market (LCM) approach, suggested in the audit report. FIFO is designed for use in applications where there is frequent inventory turnover. Due to higher potential for error in the LCM calculation, and the fact that the LCM average is simply compared to a fixed figured from which that average is based, FIFO will provide a more accurate figure in this scenario.</p> <p><b>D.4</b> Fuel volumes will be reduced by the accumulated amount of tank water as identified by the Veeder Root system. This process will be used for end of year inventory for FY 2012.</p> <p><b>D.5</b> While TCEQ has no requirement for temperature compensation to 60 degrees Fahrenheit when conducting fuel inventory, staff will utilize the temperature compensated volume listed from the Veeder Root system when conducting inventory. This process will be used for end of year inventory for FY 2012.</p>					

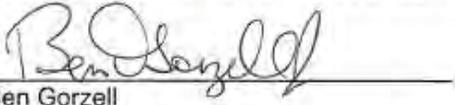
Recommendation					
#	Description	Audit Report Page	Accept, Partially Accept, Decline	Responsible Person's Name/Title	Completion Date
E	<p><b>Fuel Site Surveillance Equipment</b></p> <p>The Building and Equipment Services Director should install surveillance cameras at all COSA fueling sites. Surveillance media should be retained for at least six months.</p>	12	Decline	<p>Jorge A. Perez/Director Building and Equipment Services</p> <p>Robert Stanton/Assistant Director Building and Equipment Services</p>	
<p><b>Action plan:</b></p> <p>Building and Equipment Services has implemented several controls to monitor and control fuel dispensed. An automated fuel system has been installed to accurately track fuel consumption utilizing a radio frequency (CANCeivers) device coupled with a robust software application that prohibits the dispensing of fuel into vehicles not equipped with these devices. In instances where CANCeivers are not installed (e.g. partner agency units), a swipe device is issued to allow fuel system access. Without either of these two items, fuel cannot be dispensed. This system has an additional layer of protection using per vehicle mileage and capacity parameters that limit or prevent fuel access. The installation of surveillance cameras at fuel sites was reviewed previously and determined to be cost prohibitive due to hardware and monitoring costs. Surveillance cameras have not been proven to be either cost or operationally effective in this application.</p>					

We are committed to addressing the recommendations in the audit report and the plan of actions presented above.

Sincerely,

  
\_\_\_\_\_  
Jorge A. Perez  
Director  
Building and Equipment Services Department

10/24/12  
Date

  
\_\_\_\_\_  
Ben Gorzell  
Chief Financial Officer  
City Manager's Office

10/24/12  
Date