

CITY AUDITOR'S OFFICE



AUDIT OF SANITARY SEWER SYSTEM MAINTENANCE SECTION

Report No. CAO 1703-0809-01

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**RADFORD K. SNELDING, CPA, CIA, CFE
CITY AUDITOR**

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AUDIT OF SANITARY SEWER SYSTEM MAINTENANCE SECTION CAO 1703-0809-01

BACKGROUND

The Sanitary Sewer Maintenance Section (Sewer Maintenance) is within the Streets and Sanitation Division of the Department of Field Operations of the City of Las Vegas (City). Sewer Maintenance is funded by the City's Sanitation Enterprise Fund that was established for accounting for the operations of the City's water pollution control facilities and the construction and maintenance of sanitary sewer lines.

As defined in the City Municipal Code (14.04.120), the City is responsible for maintaining all sewer main facilities installed in City-owned rights-of-way and easements. Private property owners are responsible for the maintenance of the sewer laterals that connect to the City's sewer lines.

Sewer Maintenance performs this required function for the City through routine maintenance and repairs of approximately 1,500 of the City's 1,700 miles of sewer lines. The remaining sewer lines are high flow arterial collectors that are considered to be self-cleaning due to the high flow rates. Maintenance crews systematically clean the sewer lines using high pressure water nozzles and vacuums on trucks called Vactors. The crews also provide construction support for the maintenance and repair of sewer lines and related components (e.g., manholes, roadway collars).

Sewer Maintenance also responds to sewer stoppages and overflows. Sewer Maintenance follows specific reporting requirements of the Nevada Division of Environmental Protection (NDEP) when it encounters sewer stoppages and overflows.

The primary functions of Sewer Maintenance are identified as follows in the Department's Strategic Business Plan:

- Sanitary sewer conveyance component maintenance and repairs (cleaning of main lines, line repairs, video inspections, manhole repairs, diversion operations).
- Sanitary sewer private collection component responses (identification of lateral issues and provision of customer service assistance).
- Sanitary sewer overflow ("SSO") responses (removal of obstructions and restoration of flow, mitigation of contamination, and regulatory compliance reporting).

Sewer Maintenance staff members include a Foreman, 2 Crew Leaders, an Inspector, and 19 maintenance workers. They are overseen by the Manager and Superintendent of the Streets and Sanitation Division.

OBJECTIVES

The audit objectives were to evaluate the overall effectiveness and efficiency of the operations of Sewer Maintenance and to ensure that they are complying with regulatory guidelines.

SCOPE AND METHODOLOGY

The scope of this audit was limited to the operations of Sewer Maintenance. Detailed testing of records was primarily limited to transactions during calendar year 2007. The last fieldwork date of this audit was May 27, 2008.

The scope of our work on internal control was limited to the controls within the context of the audit objectives and the scope of the audit.

Our audit methodology included:

- Research of applicable guidelines,
- Interviews of City personnel,
- Observations of work processes, and
- Analysis and detail testing of available data.

We conducted this performance audit in accordance with generally accepted government auditing standards except for the requirement for an external peer review every three years. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

CONCLUSIONS, FINDINGS AND RECOMMENDATIONS

We identified the following issues during the audit of Sewer Maintenance:

Activity Records (Finding 1): Improvements are needed in Sewer Maintenance's recordkeeping practices to facilitate the summarization of operational activity and support management reporting.

Spill Reporting Requirements (Finding 2): Clarification is needed from NDEP on whether stoppages without an overflow need to be reported. Documented policies and procedures are needed giving direction to employees on how to comply with the Spill Reporting Policy.

Clark County Permits (Finding 3): An intergovernmental agreement with Clark County is needed giving Sewer Maintenance access rights to city sewer lines running through County land.

Video Inspection Program (Finding 4): Improvements are needed in the administration of the current video inspection program. Sewer Maintenance should pursue transferring the responsibility and costs for video inspections of sewer lines to contractors and developers.

Call Before You Dig Program Compliance (Finding 5): Sewer Maintenance working with Public Works needs to evaluate what additional measures need to be taken to comply with NRS 455 and document its compliance methodology, policies, and procedures.

Equipment and Supplies (Finding 6): Sewer Maintenance needs to document and implement a formal equipment and supplies inventory control program.

Training Tracking and Monitoring (Finding 7): The Field Operations Safety and Health Officer should regularly summarize the training status of Sewer Maintenance employees in relation to OSHA and City safety training requirements and make this information available to Sewer Maintenance management.

Performance Measurements (Finding 8): The appropriateness and value of the current performance measurements need to be evaluated. The definition and derivation of the performance measurements need to be documented.

Public Reporting Using City Website (Finding 9): Enhancements are needed to the sewer problem reporting screens on the City's website.

Standard Operating Procedures (Finding 10): Standard operating procedures are needed for the primary functions of Sewer Maintenance.

Further information is contained in the sections below. While other issues were identified and discussed with management, they were deemed less significant for reporting purposes.

1. ACTIVITY RECORDS

Criteria

Detail records should facilitate the summarization of operational activity and support management reporting and performance measurements. These records should provide assurance that the information being gathered is accurate and complete.

Condition

Sewer Maintenance operational activity information is accumulated on various records as follows:

- *Daily Sanitary Sewer Cleaning Records (Daily Sheets)* – form used by work crews to record their daily activities including the location and linear feet of sewer lines cleaned and information on sewer stoppages and overflows. This is the primary document used to determine when a sewer line was cleaned.
- *Sanitation Collections Spreadsheet* – monthly summarization from the Daily Sheets of linear feet of sewer lines cleaned by equipment.
- *All SAN Calls Spreadsheet* – spreadsheet of service calls from the Hansen System (Hansen) with the date, location, and nature of the call. Hansen is the customer complaint/service system in which sewer problems reported by the public, city departments, and council offices are recorded.
- *Sewer Stoppage and Overflow Report (SSO Report)* – form currently used to document the details of sewer stoppages and overflows. Each SSO Report is assigned a unique number.
- *24-Hr SSO Report* – SSO Report that is faxed to NDEP (and other agencies as appropriate) within 24 hours of an overflow that “imminently and substantially endangers human health.”
- *5-Day SSO Report* – Detail follow-up report to NDEP on an overflow that required a 24-Hr SSO Report.
- *Quarterly SSO Activity Report Spreadsheet* – quarterly spreadsheet identifying all SSO reports completed. The information within this spreadsheet is used by the City’s Environmental Division in completing their Quarterly SSO Report for NDEP.

The current recordkeeping practices do not facilitate the summarization of operational activity and support management reporting requirements as evidenced by the following issues:

- There are no documented internal operating procedures on how these records should be completed.
- There is a lack of uniformity in how events (e.g., private stoppages, public stoppages, overflows) are identified on the *Daily Sheets*.
- The *Daily Sheets* do not require summarization of events encountered during the day (e.g., number or type of stoppages or overflows addressed, lateral line calls

responded to, bug problems, odor problems) to facilitate summarization of daily activities.

- Information on the last time a sewer line was cleaned is not readily accessible. The *Daily Sheets* must be reviewed to identify this information.
- The *Daily Sheets* and the *All SAN Calls Spreadsheet* do not reference Hansen service request numbers or SSO numbers.
- Hansen and the *All SAN Calls Spreadsheet* do not differentiate between stoppages and overflows as the term “stoppage” is used to identify both.
- There is no formal periodic review of Hansen service requests to ensure that all necessary SSO Reports have been completed.

Cause

- Internally maintained records do not facilitate the summarization of operational activity for management decision making and reporting requirements.

Effect

- Lack of assurance that management reports and performance measurements are accurate and complete.

Recommendation

Sewer Maintenance management should evaluate the recordkeeping deficiencies identified within this audit finding and make necessary changes to improve the correlation, reliability, and usefulness of its internal records. Sewer Maintenance management should document guidelines to be followed in completing the key documents and spreadsheets used in its operations. The following ideas should be considered:

- Work activity categories could be created that align with management reporting requirements and performance measurements for use on the *Daily Sheets*. These work activity categories could be documented on the *Daily Sheets* for reference by the work crews.
- A work activity summarization box could be added to the *Daily Sheets* where work crews could summarize their daily activities by the established work activity categories. The information from this box could be accumulated on a spreadsheet.
- When a crew responds to a service request from Hansen, the corresponding service request number could be documented on the *Daily Sheet*.
- A monthly report could be generated from Hansen and reviewed to ensure that all required SSO reports have been completed.
- The *All SAN Calls Spreadsheet* could be expanded to document more information on the nature of each call and whether the event is reportable.

2. SPILL REPORTING REQUIREMENTS

Criteria

The *Spill Reporting Policy* from the Nevada Division of Environmental Protection (NDEP) requires the City to report its Sanitary Sewer Overflows (SSO). The Spill Reporting Policy defines an SSO as “any diversion, bypass, spill, overflow or discharge of untreated or partially treated wastewater from wastewater treatment, collection, or conveyance facilities under control of the permittee, other than through points of discharge identified in a discharge permit. In the event the permittee has knowledge that an SSO is probable or has occurred, the permittee shall report in accordance with this policy.”

Those overflows that “imminently and substantially endanger human health” must be reported to NDEP within 24 hours followed-up by a 5-day report. All overflows must be reported in a quarterly SSO report.

Condition

While the *Spill Reporting Policy* points to an SSO being an incident where wastewater escapes or spills from the sewer system, the current SSO Report has check boxes for users to identify whether the incident is a stoppage (backup) or an overflow (discharge) or both. Sewer Maintenance currently uses the SSO Report for documenting both overflows and non-lateral line stoppages.

The following is a summary of the types of SSO’s reported by Sewer Maintenance during 2007:

2007	Stoppage Only	Overflow Only – Exceeds Capacity	Stoppage and Overflow
First Quarter	4	0	10
Second Quarter	6	0	12
Third Quarter	6	0	8
Fourth Quarter	2	0	15

SSO Reports are summarized quarterly in the *Quarterly SSO Activity Report Spreadsheet*. This spreadsheet and the corresponding individual SSO Reports are forwarded by Sewer Maintenance to the City’s Wastewater Pollution Control Facility management for use in their reporting to NDEP.

While information on the various types of sewer stoppages encountered without a discharge is valuable internally for identifying and tracking problem areas of the sewer lines, stoppages without an overflow may not need to be documented on an SSO report

and included in the quarterly reporting to the City's Environmental Division and NDEP based on the *Spill Reporting Policy's* definition of an SSO.

Sewer Maintenance has not documented how it follows and complies with the State's *Spill Reporting Policy*. Therefore, there is no internal documented direction on which stoppages and overflows Sewer Maintenance deems to be reportable and when they should complete a 24-hour report and a 5-day report.

Cause

- Need for reporting of stoppages has not been questioned.
- Lack of documented policies and procedures.

Effect

- Unnecessary information may be reported to NDEP.
- Potential for lack of uniformity among staff members in complying with *Spill Reporting Policy*.
- Potential for fines if *Spill Reporting Policy* is not followed.

Recommendation

Sewer Maintenance management working with the City's Public Works Environmental Division should seek clarification from NDEP on whether sewer stoppages without an overflow need to be included in the Quarterly SSO Report. If not needed, Sewer Maintenance should discontinue use of the SSO Report for documenting stoppages without an overflow and create an alternative means for documenting and monitoring these stoppages.

Sewer Maintenance management should create documented policies and procedures giving direction to their employees on how to comply with the *Spill Reporting Policy*. These policies and procedures should include guidance on the following areas:

- staff member responsibilities
- proper completion of data fields on SSO Reports
- when to complete a 24-hour report and the required distribution of the report
- supporting documentation requirements

3. CLARK COUNTY PERMITS

Criteria

City departments should comply with Clark County permitting requirements.

Condition

Sewer Maintenance employees do not obtain a Clark County permit each time they access city sewer lines that run through Clark County land. Sewer Maintenance management acknowledged that they are in need of a blanket intergovernmental agreement/permit for performing maintenance and repairs of these city sewer lines.

While Clark County employees are cooperative with Sewer Maintenance, a formal intergovernmental agreement would ensure the City is in compliance with Clark County permitting requirements.

Cause

- Lack of a formalized intergovernmental agreement allowing access to Clark County land for service of City sewer lines.

Effect

- Potential for violation of Clark County permit requirements.

Recommendation

Sewer Maintenance management working with the City Attorney's Office and Public Works should enter into discussions with Clark County representatives to create an intergovernmental agreement giving them access to the city sewer lines running through Clark County land without the need for individual permits.

4. VIDEO INSPECTION PROGRAM

Criteria

Pertinent information on program performance should be readily available for monitoring and to ensure accountability of employees.

Condition

The City requires all privately funded infrastructure improvement projects to be inspected prior to acceptance and approval for release of contractor bond money by the City. This inspection process is overseen by the City Engineer's Off-site Inspection and Testing Division (OIT) of Public Works. Sewer Maintenance supports OIT in this process by overseeing the approval of new sewer lines. The Sewer Maintenance Inspector (Inspector) coordinates a video inspection of new sewer lines by an outside contractor to ensure that the construction is in accordance with design and construction standards and that there are no blockages. Following the video inspection, the Inspector either accepts or rejects the sewer lines.

While residential real-estate construction was booming, Sewer Maintenance struggled to timely complete the video inspections. Sewer lines often ended up being inspected after the streets above the lines had been paved over and the sewer lines had been placed into operation. These delays caused frustrations with contractors and developers who were unable to get their bond money released until the sewer lines were inspected and approved.

With the current slowdown in residential construction, the number of video inspections has decreased. Sewer Maintenance management is currently re-evaluating how this program is administered and is considering moving responsibility and costs for the video inspections to the developers and contractors. Certified videos would be required to be submitted to Sewer Maintenance for review prior to acceptance of the sewer lines.

Based on an evaluation of this program and discussions with various City staff, this appears to be a good alternative to current practice and an optimal time to make the changes considering the reduced demand. Until these changes can be made, the video inspection program will continue to function as it has in the past.

The following issues were noted in the administration of the current video inspection program:

- Documented Operating Procedures – Documented operating procedures do not exist for the video inspection program.
- Monitoring of Timeliness of Video Inspections – The video inspection request dates and the acceptance or rejection dates are not readily available for monitoring the timeliness of Sewer Maintenance in responding to the video inspection requests. OIT maintains spreadsheets that initially include the request date, but it is overwritten with the acceptance date when the sewer lines are accepted.
- Documentation of Rejections – The Inspector identifies unacceptable sewer lines by checking the "Not Acceptable" space on the video inspection request form and signs and dates the form. While the Inspector discusses the failure with the

contractor/developer and maintains the corresponding video inspection report, the details on the rejection are not documented and readily available for review and monitoring. In addition, there is no formal correspondence to the developers and contractors documenting the reason for the sewer line rejection and reference to the applicable design and construction standards that were not met.

- Payments for Delays – The current form used by contractors to request a video inspection states that “if for any reason the camera truck is unable to access the manholes, or the camera is unable to pass through a section of line, the contractor will pay for all standby/re-test time for that section of line, and will have to completely reschedule the televising for his project.” This clause is not enforced by Sewer Maintenance and there are no payment collection procedures to follow if it was enforced. Note: Considering the delays caused by Sewer Maintenance in the past, it would have been difficult for them to enforce this clause with developers and contractors.
- Review of Outside Contractor Invoice – The monthly invoice from the contractor is only reconciled to a summary report (known as the Index Report) rather than to the detail video inspection reports showing the lengths of the sewer lines surveyed.
- Sewer Lines Televised Measurement – One of the monthly measurements tracked and reported to Field Operations management (and previously to the City Manager’s Office) is “Sewer Main Televised (feet) – contracted.” This measurement is also included on the Summary of Quarterly In-House Sanitary Sewer Collection System Maintenance Activities to the Environmental Division Manager and the Quarterly SSO Report to NDEP. The title of this measurement is inaccurate as the data reported is the total length of the sewer line not the total length surveyed/televised. These measurements are often different due to abandoned surveys.

Cause

- The Inspector until recently has run the program with minimal oversight and accountability.

Effect

- Lack of readily accessible information on the performance of the video inspection program.
- Limited accountability by the Inspector.

Recommendation

Sewer Maintenance management should pursue transferring the responsibility and costs for the video inspections to contractors and developers. Sewer Maintenance management should document the details of the new program including:

- Procedures to be followed by staff members
- Requirements of contractors and developers including forms to be completed and documents to be submitted
- Timelines to be followed by staff members
- Deadlines for contractors and developers

If the new program is not implemented, Sewer Maintenance management should:

- Revise the verbiage relating to charging contractors and developers for standby/re-test time or implement a method by which fees could be assessed.
- Improve monitoring of the performance of the video inspection program by documenting and tracking at a minimum the video inspection request date, acceptance date, rejection date, and reason for the rejection.
- Create a formal letter of rejection template with reference to applicable sewer design and construction standards for distribution to contractors and developers on rejection of a sewer line.
- Reconcile the video inspection contractor invoices to the detail video inspection reports.

Sewer Maintenance should determine what performance measurements relating to the video inspection program should be tracked and ensure the measurement titles properly reflect what is being reported.

5. CALL BEFORE YOU DIG PROGRAM COMPLIANCE

Criteria

NRS Chapter 455 addresses the codification of the “Call Before You Dig” industry practice. As noted in a summary of these regulations, “these rules provide minimum requirements to excavators, operators, and the association for operators. They provide a structure under which underground excavations and demolitions can proceed safely and efficiently.”

The City is defined as an Operator under this statute. An Operator is defined as “any person who owns, operates or maintains a subsurface installation.” Examples of subsurface installations include electrical, water, gas, cable, phone, and sewer lines.

As an Operator, the City is required to belong to an “Association for Operators” that receives notifications of underground work to be performed and transmits these notifications to its members. The City is a member of an organization called USA North that serves this function.

The duties of an Operator as identified in NRS 455.130 & 131 are summarized below:

- Locate and identify the subsurface installations and if known, the number of subsurface installations that are affected by the proposed excavation or demolition...within 2 working days or within a time mutually agreed upon by the operator and the person who is responsible for the excavation or demolition.
- Remove or protect a subsurface installation as soon as practicable if the Operator decides it should be removed or protected.
- Advise the person who has contacted the Association for Operators of the location of the subsurface installations of the operator that are affected by the proposed excavation or demolition.
- Notify the person who contacted the Association for Operators if the Operator has no subsurface installations that are affected by the proposed excavation or demolition.
- An Operator shall, for each subsurface installation that is installed on or after October 1, 2005, which cannot be detected from or above the surface of the ground by means of either the material used in constructing the subsurface installation or a conductor within the subsurface installation, install a permanent device which designates or provides a means of detecting a subsurface installation through the use of a noninvasive method from or above the surface of the ground. Such a device includes, without limitation, a tracer wire or a marker.

In conjunction with NRS 455.140, the Public Utilities Commission of Nevada recently voted to require the submission of a form to the Regulator Operations Staff of the Commission when there is any contact with, exposure of or damage to a subsurface installation during an excavation or demolition. This form requires both the excavator and the Operator to identify whether the actions of the Operator contributed to the occurrence. Among the boxes that must be checked in describing whether the actions of the Operator contributed to the occurrence are:

- Failed to abide by special agreement between the Operator and excavator.
- Operator performed marking but it was incorrect/incomplete.
- Operator did not perform marking within the two working day requirement.
- Operator did not perform marking within mutually agreed upon time frame.
- Operator failed to make replacement marks requested by excavator.
- Operator not a member of the One-Call Center.

Condition

The *Call Before You Dig* program is a free service to homeowners, contractors and excavators that plan to dig, trench, drill or perform underground projects to have buried

utility lines properly identified prior to the start of work. Public and private excavators are to call 811 at least two working days before the start of any digging project so that buried utility lines can be identified and properly marked by “Operators” prior to the start of an excavation project.

The City is a member of an association (USA North) that receives the 811 calls on planned excavations and in-turn transmits this information to its members on electronic work tickets.

The only City staff members currently on-line to receive this information are in the City’s Traffic Engineering Division. This division currently has two full-time staff members that evaluate the incoming work tickets and complete utility markings for traffic signal and traffic light power lines. These staff will only contact Sewer Maintenance with information on a work ticket if a contractor specifically requests that the sewer lines be marked.

Sewer Maintenance is not currently on-line with USA North to receive their work tickets and has not implemented a sewer marking program due to the following:

- Sewers typically run in a straight line from manhole cover to manhole cover. With this understanding, excavators should be able to avoid hitting sewer lines.
- The manhole covers are considered by management to be “permanent markers” as defined by NRS and alert excavators of the presence of sewer lines.
- There have been few known instances of excavators breaking sewer lines.
- An active sewer marking program would require significant time and resources as experienced by the Traffic Engineering Division.

Sewer Maintenance management acknowledges that they may need to do more to be in full compliance with NRS 455. However, budget constraints and staff limitations present a challenge in addressing this area.

Cause

- A sewer marking program has not been implemented due to limited budget and staff.
- Limited perceived risk.

Effect

- Potential for breakage of sewer lines by excavators.
- Potential for unreported breakage and repairs of sewer lines by excavators.
- Possible non-compliance with NRS 455.

Recommendation

Sewer Maintenance management working with Public Works (Traffic Engineering and Engineering Planning Divisions) should further evaluate the adequacy of their compliance with NRS 455 and what additional measures should be taken to ensure compliance. Sewer Maintenance management should document its methodology, policies, and procedures for complying with NRS 455.

6. EQUIPMENT AND SUPPLIES

Criteria

The City's equipment and supplies should be properly secured and accounted for.

Condition

Sewer Maintenance employees use a variety of equipment and supplies for performing their job responsibilities including various chemicals, degreasers, manhole covers, pipe, hoses, equipment replacement parts, and various small tools. Most of the non-vehicle equipment and supplies used by Sewer Maintenance are stored in a building at the City's West Service Center.

Sewer Maintenance does not maintain an internal record of its equipment. While certain high-dollar (greater than \$5,000) and "sensitive" items are recorded by the City's Fixed Assets Division and periodically sent to Sewer Maintenance for verification, these records do not include all of their equipment.

Access to the City's West Yard is restricted by a restricted access gate and access to the West Yard supply building is restricted to certain employees with valid keys. Those Sewer Maintenance employees with keys, as well as employees from other departments/divisions with keys, have access to the storage building and are able to take supplies without documenting what was taken. The Sewer Maintenance Foreman is notified by employees when supply levels are low.

While informal efforts have been made in the past to document equipment and supplies, Sewer Maintenance has not implemented a formal inventory program for its equipment and supplies.

Cause

- Lack of a formalized equipment and supplies inventory program.

Effect

- Potential for theft of equipment and supplies without notice.

Recommendation

Sewer Maintenance management should document and implement a formal equipment and supplies inventory control program. Periodic inventories of equipment and supplies should be conducted. Changes in supply levels should be evaluated for reasonableness based on activity. Sewer Maintenance management should consider requiring employees to document supplies being taken from the storage building.

7. TRAINING TRACKING AND MONITORING

Criteria

Current and readily accessible information on the training status of employees enables management to monitor compliance and plan for training needs.

Condition

Sewer Maintenance employees are required under guidelines established by the City and the Occupational Safety and Health Administration (OSHA) to meet various safety training requirements. Sewer Maintenance employees are trained in a variety of areas including hazardous chemical use, street barriers, forklifts, blood borne pathogens, hearing conservation, confined space entry, and safe lifting. The frequency of the training varies from annually to every three years. The Department of Field Operations has a Safety and Health Officer (Safety Officer) that oversees training for the Department's employees including those in Sewer Maintenance.

The Field Operations Safety Officer requires employees attending training classes to sign-in as evidence of their attendance. While these detail attendance records are filed away by the Safety Officer, the training status of employees in relation to City and OSHA training requirements is not summarized for all training received and is not readily accessible to Sewer Maintenance management. As a result, Sewer Maintenance management lacks readily accessible information to monitor the training status and training needs of employees in relation to OSHA and City safety training requirements.

Sewer Maintenance uses what is known as the *New Employee Orientation Checklist* to guide supervisors through areas to be discussed with new employees and the training they should initially receive. This checklist has not been updated since March 14, 2001 and the training section is not reflective of current requirements.

Cause

- Lack of a formalized employee safety training status summary for reference by Sewer Maintenance management.

Effect

- Lack of readily accessible employee safety training information for Sewer Maintenance management.

Recommendation

The Field Operations Safety and Health Officer should regularly summarize the training status of Sewer Maintenance employees in relation to OSHA and City safety requirements. This summarization should be made available to Sewer Maintenance management. The Field Operations Safety and Health Officer should also work with Sewer Maintenance management in updating their *New Employee Orientation Checklist*.

8. PERFORMANCE MEASUREMENTS

Criteria

Performance measurements and the method by which the measurements are gathered or derived should be clearly defined and consistent from one reporting period to another.

Condition

Sewer Maintenance currently tracks the following performance measurements:

- Sewer mains cleaned (miles)
- Sewer mains televised (feet) – contracted
- Sewer laterals televised (feet) – in-house
- Reportable sanitary sewer overflows

In testing this data, the following issues were noted:

- *Sewer mains televised (feet)* – The total linear feet of the lines scheduled to be inspected is reported rather than the total linear feet of lines actually surveyed. There are regular differences in these numbers due to obstructions encountered by the inspection contractor.
- *Sewer laterals televised (feet)* – The total number of occurrences where a sewer lateral was televised/recorded by staff members is reported rather than the total number of linear feet as the title of this measurement implies.

- *Reportable Sanitary Sewer Overflows* – Differences were identified between the number of SSO's reported on the performance measurement spreadsheet and that shown on the Quarterly SSO Report Activity spreadsheet. It is unclear what the differentiation is between a "reportable" and a "non-reportable" SSO for purposes of this performance measure.

There are no documented operational procedures defining these performance measurements and how they should be derived.

Sewer Maintenance will soon begin tracking and reporting the following new performance measurements:

- Percentage of sanitary sewer overflows resolved in less than 4 hours of notification
- Percentage of associated damage claims denied for lack of responsible cause

Sewer Maintenance has not yet established how data for these performance measurements will be gathered.

Certain performance measurements not currently being summarized that may be useful for Sewer Maintenance and Field Operations management include the following:

- Number of lateral line stoppage service calls made.
- Number of lateral line repairs made.
- Revenue received from lateral line repairs.
- Number of non-overflow stoppages responded to.
- Average response times to incidents.

Cause

- Lack of documented performance measurement definitions.

Effect

- Potential for inaccurate or inconsistent performance measurements for management use and decisions.

Recommendation

Sewer Maintenance management should:

- Evaluate the appropriateness and value of the current performance measurements being tracked.
- Evaluate whether additional performance measurements should be tracked.
- Document the definition and derivation of each performance measurement used.
- Ensure the performance measurement titles properly reflect the data being reported.

9. PUBLIC REPORTING USING CITY WEBSITE

Criteria

On-line customer service screen menus should help guide users through the menu structure and provide useful information.

Condition

The public can report sewer problems to Sewer Maintenance using the City's website. This information feeds into the Hansen System for review and tracking by the Streets and Sanitation Division. The following issues with the City website screens and the Hansen System were identified:

- The Streets and Sanitation Division regularly receives sewer billing questions from the public through the City's website. Sewer billing issues are handled by the Department of Finance, not Sewer Maintenance. The current menu options available to website users may contribute to this problem. While users have the menu options *Sewer Billing* and *Streets and Sewer Services* to choose from, the use of the term *Sewer Services* may be too general. The use of the term *Sewer Maintenance* may help to further differentiate the two menu options.
- While the maintenance of streets and sewers are overseen by the same City division, it may be helpful to have separate menu options on the website for these two areas.
- On a request for help screen, the only description of the areas handled by Sewer Maintenance is *sewer odors and blocked sewers/drains*. This description could be expanded to include more of the issues handled by Sewer Maintenance (e.g., bug problems, missing or damaged manhole covers, sewer overflows). In addition, this screen could be used to encourage the public to immediately call-in sewer overflows and to educate the public on their responsibility for maintenance of their lateral sewer lines.
- Website users have the option of providing their email address in a field next to the statement, *Required to receive status of request via email*. Users also have the option of checking a box that reads, *Please contact me regarding the progress of this request*. These statements imply that if users provide their email address, they will get updates on the status of their request via e-mail. In testing this function, it was discovered that the e-mail notification function has been turned off without any change to the verbiage on the website screens.

- Within Hansen, City staff members have the following options for identifying the nature of a reported sewer issue:
 - SABUGS (bug problems)
 - SAMH (manhole cover off or missing)
 - SASO (sewer odor)
 - SASTP (sewer stoppage)
 - SAOTH (other)

No option is available to identify and track sewer overflows. Considering the significance of overflows for reporting purposes, this should be an option.

Cause

- City website menu deficiencies.
- Hansen system option limitation.

Effect

- Problem reports being forwarded to wrong department.
- Public may have expectation of a return e-mail with status of City's response to reported issue.
- Lack of ability within Hansen to differentiate between sewer stoppages and overflows.

Recommendation

Sewer Maintenance management should work with the City's Information Technologies Department to address the noted deficiencies in the website menu screens being used by the public to report sewer problems. In addition, Sewer Maintenance management should request that a sewer overflow category be added in Hansen to allow for differentiation between sewer stoppages and overflows.

10. STANDARD OPERATING PROCEDURES

Criteria

Standard operating procedures (also known as desk procedures) address the key activities and processes of an organization, how they are performed, and by whom. They assist employees and management in performing the daily functions of an organization. These procedures formally establish employee accountability, provide orientation and reference material for employees, and document the institutional knowledge of existing staff in case of employee turnover or extended absences.

Condition

Sewer Maintenance has minimal documented operating procedures for their primary functions and processes. The primary functions of Sewer Maintenance are identified in the Department's Strategic Business Plan as follows:

- Sanitary sewer conveyance component maintenance and repairs (cleaning of main lines, line repairs, video inspections, manhole repairs, diversion operations).
- Sanitary sewer private collection component responses (identification of lateral issues and provision of customer service assistance).
- Sanitary sewer overflow ("SSO") responses (removal of obstructions and restoration of flow, mitigation of contamination, and regulatory compliance reporting).

Cause

- General familiarity of existing practices and protocol among employees.

Effect

- Potential for loss of institutional knowledge with employee turnover or extended absences.
- Reduced staff accountability without documented procedures.

Recommendation

Sewer Maintenance management should create documented standard operating procedures for its three primary functions to enhance management oversight, improve staff accountability, provide orientation and reference material for staff, and document the institutional knowledge of existing staff in case of employee turnover or extended absences. For purposes of this audit, documented standard operating procedures should be created for the following areas:

Sanitary sewer conveyance component maintenance and repairs (cleaning of main lines, line repairs, video inspections, manhole repairs, diversion operations)

- Daily responsibilities of work crews including documentation requirements (see Finding #1)
- Use of Hansen customer complaint/service system
- Monthly activity summarization and reporting
- Video inspection program (see Finding #4)
- Equipment and supplies inventory control program (see Finding #6)
- Overtime and after-hours call-out rotation
- Performance measurement summarization (see Finding #8)
- Document retention compliance guidelines

Sanitary sewer private collection component responses (identification of lateral issues and provision of customer service assistance)

- Lateral line customer assistance program

Sanitary sewer overflow (“SSO”) responses (removal of obstructions and restoration of flow, mitigation of contamination, and regulatory compliance reporting)

- NDEP Spill Reporting Policy compliance (see Finding #2)
- Call Before You Dig program compliance (see Finding #5)

MANAGEMENT RESPONSES

1. ACTIVITY RECORDS

Recommendation: Sewer Maintenance management should evaluate the recordkeeping deficiencies identified within this audit finding and make necessary changes to improve the correlation, reliability, and usefulness of its internal records. Sewer Maintenance management should document guidelines to be followed in completing the key documents and spreadsheets used in its operations. The following ideas should be considered:

- Work activity categories could be created that align with management reporting requirements and performance measurements for use on the *Daily Sheets*. These work activity categories could be documented on the *Daily Sheets* for reference by the work crews.
- A work activity summarization box could be added to the *Daily Sheets* where work crews could summarize their daily activities by the established work activity categories. The information from this box could be accumulated on a spreadsheet.
- When a crew responds to a service request from Hansen, the corresponding service request number could be documented on the *Daily Sheet*.
- A monthly report could be generated from Hansen and reviewed to ensure that all required *SSO reports* have been completed.
- The *All SAN Calls Spreadsheet* could be expanded to document more information on the nature of each call and whether the event is reportable.

Management Action Plan:

- The format of the *Daily Sheet* will be reviewed and modified to provide for more efficient collection of data.
- A graphical map component will be added to allow for quicker and verifiable determination of activity dates for a specific location (e.g., response to subpoena request).
- Productivity as measured by hourly cleaning rates will be collected and compared to ensure all crews are performing within an acceptable statistical deviation from average productivity.
- The form will be constructed to allow for comparison with the @Road GPS stop log results, and random audits will be instituted to ensure appropriate and consistent levels of crew productivity.
- Tabular formatted activity sheets will be utilized for daily events other than cleaning activities, and to document responses to external concerns (e.g., Hansen) and identify field noted issues (e.g., partial blockages). The *All SAN Calls Spreadsheet* will be modified and/or replaced by this collection of data.
- Cost summary sheets, similar to those currently used for lateral repairs, will be implemented for non-routine activities, (e.g., lateral repairs, manhole repairs,

support for other divisions), in order to identify the value of expenditures on activities other than routine maintenance.

- The Hansen data entry will be reviewed to ensure false reports of sanitary sewer overflows (e.g., leaking water meters, “bubble-up” storm drain manholes) are correctly identified as such.
- A quarterly review of the data collection results, individually and collectively among staff, will be established.

Estimated Date of Completion:

- The new data collection sheets will be implemented by October 1, 2008.
- The GPS random audits will be implemented by November 1, 2008.
- The quarterly review meetings will be implemented by January 15, 2009.

2. SPILL REPORTING REQUIREMENTS

Recommendation: Sewer Maintenance management working with the City’s Public Works Environmental Division should seek clarification from NDEP on whether sewer stoppages without an overflow need to be included in the Quarterly SSO Report. If not needed, Sewer Maintenance should discontinue use of the SSO Report for documenting stoppages without an overflow and create an alternative means for documenting and monitoring these stoppages.

Sewer Maintenance management should create documented policies and procedures giving direction to their employees on how to comply with the *Spill Reporting Policy*. These policies and procedures should include guidance on the following areas:

- staff member responsibilities
- proper completion of data fields on SSO Reports
- when to complete a 24-hour report and the required distribution of the report
- supporting documentation requirements

Management Action Plan:

- In accordance with the definition of an SSO in the original reporting policy developed in conjunction with staff from the Nevada Department of Environmental Protection, which states that “SSO means any diversion, bypass, spill, overflow or discharge of untreated or partially treated wastewater from wastewater treatment, collection, or conveyance facilities under control of the permittee, other than through points of discharge identified in a discharge permit”, staff will no longer report stoppages without overflows as an SSO. Instead full and partial stoppages will be tracked internally only, via the activity sheets described in Item 1, and a TBD graphical format (e.g., a map with color coded incidents, GIS layer input added in conjunction with PW staff).
- A SSO procedure will be compiled and all staff trained on response and documentation requirements and activities.

- The procedure will include 24-hour and 5-day report requirements, but primary responsibility for those activities will remain with the Division Manager, as these incidences will by nature have property damage and/or regulatory citation liabilities.
- Compilation of mitigation costs will be added to the SSO tracking.

Estimated Date of Completion:

- Identification of stoppages without overflows, in the SSO reporting submitted to NDEP, will be eliminated on July 1, 2008.
- Training and implementation of internal SSO response and documentation procedure will be implemented by September 15, 2008.

3. CLARK COUNTY PERMITS

Recommendation: Sewer Maintenance management working with the City Attorney's Office and Public Works should enter into discussions with Clark County representatives to create an intergovernmental agreement giving them access to the city sewer lines running through Clark County land without the need for individual permits.

Management Action Plan:

- Previous S&S requests to have this issue addressed in associated agreements have been rejected by PW and CAO, so this will need to be a stand-alone agreement. The City will have little leverage with the County in any negotiations, and the County would likely prefer to treat the City similar to other utility providers (e.g., Nevada Power, Southwest Gas). Unless the City is willing to take a firm stance on this issue (e.g., no further connections until an agreement is executed), we may find the County uncooperative and/or unrealistic. Nonetheless S&S staff will work with County maintenance staff to draft an agreement for review by the respective Public Works and Attorney staffs.

Estimated Date of Completion:

- The draft will be forwarded for PW and CAO review and action by March 1, 2009.

4. VIDEO INSPECTION PROGRAM

Recommendation: Sewer Maintenance management should pursue transferring the responsibility and costs for the video inspections to contractors and developers. Sewer Maintenance management should document the details of the new program including:

- Procedures to be followed by staff members
- Requirements of contractors and developers including forms to be completed and documents to be submitted

- Timelines to be followed by staff members
- Deadlines for contractors and developers

If the new program is not implemented, Sewer Maintenance management should:

- Revise the verbiage relating to charging contractors and developers for standby/re-test time or implement a method by which fees could be assessed.
- Improve monitoring of the performance of the video inspection program by documenting and tracking at a minimum the video inspection request date, acceptance date, rejection date, and reason for the rejection.
- Create a formal letter of rejection template with reference to applicable sewer design and construction standards for distribution to contractors and developers on rejection of a sewer line.
- Reconcile the video inspection contractor invoices to the detail video inspection reports.

Sewer Maintenance should determine what performance measurements relating to the video inspection program should be tracked and ensure the measurement titles properly reflect what is being reported.

Management Action Plan:

- Review history of expenditures and results for this program to confirm and demonstrate that it has not historically been a cost effective use of resources.
- Review activities and incoming project listings of the last few months to demonstrate the program need has been drastically reduced due to the slow down in residential and commercial construction.
- Draft modification for standard Off-Site Improvement Agreement template to define requirements for Developer provision of video inspections, and address requirements for open agreements.
- Submit proposal to FO Director, select PW staff, select Finance staff, HR management and CAO for program elimination, Off-Site Improvement Agreement modification, and elimination/reallocation of assigned resources.

Estimated Date of Completion:

- The proposal will be submitted by July 1, 2008.

5. CALL BEFORE YOU DIG PROGRAM COMPLIANCE

Recommendation: Sewer Maintenance management working with Public Works (Traffic Engineering and Engineering Planning Divisions) should further evaluate the adequacy of their compliance with NRS 455 and what additional measures should be taken to ensure compliance. Sewer Maintenance management should document its methodology, policies, and procedures for complying with NRS 455.

Management Action Plan:

- This issue has been reviewed among the aforementioned Divisions and the consensus agreement is that visual identification through the installation of surface components (i.e., manhole lids), can be construed to provide compliance with the requirements of NRS 455, as it relates to sanitary sewer installations. Furthermore, given the infrequency of incidences and minimal costs the City has incurred with respect to this issue, it would not seem to be cost effective to implement a more stringent identification program.
- Sewer maintenance management staff will work with PW staff to see if additional improvements to the current system are appropriate.

Estimated Date of Completion:

- May 1, 2009.

6. EQUIPMENT AND SUPPLIES

Recommendation: Sewer Maintenance management should document and implement a formal equipment and supplies inventory control program. Periodic inventories of equipment and supplies should be conducted. Changes in supply levels should be evaluated for reasonableness based on activity. Sewer Maintenance management should consider requiring employees to document supplies being taken from the storage building.

Management Action Plan:

- A listing of equipment will be generated, with photographs of each, and compiled in a binder for documentation purposes. A quarterly inventory will be taken to ensure all equipment is accounted for.
- Supplies are generally procured on an as-needed basis, and fall into 2 categories, equipment replacement parts (e.g., hoses) and consumables (e.g., deodorant materials). The supplies will be included in the quarterly inventory review, and applicable procurements for the period in question reviewed to ensure consistent levels of use.

Estimated Date of Completion:

- The inventory and supply listing will be completed by August 15, 2008, and quarterly inventory reviews will start in January, 2009.

7. TRAINING TRACKING AND MONITORING

Recommendation: The Field Operations Safety and Health Officer should regularly summarize the training status of Sewer Maintenance employees in relation to OSHA and City safety requirements. This summarization should be made available to Sewer

Maintenance management. The Field Operations Safety and Health Officer should also work with Sewer Maintenance management in updating their *New Employee Orientation Checklist*.

Management Action Plan:

- Training class sign-in sheets are now being given to the City's HR Department for recording into the Oracle system for tracking and summarization purposes. A report showing the training status of Sewer Maintenance employees has been developed and will be given to management quarterly for their review. The first status report will be given to Sewer Maintenance management at the November 2008 Supervisory Meeting with a summary of the period from 7/1/08 to 9/30/08.
- Input will be given to Sewer Maintenance management on changes needed to the New Employee Orientation Checklist so it reflects current training requirements.

Estimated Date of Completion:

- First training status report will be created by November 2008.
- New Employee Orientation Checklist will be updated by August 1, 2008.

8. PERFORMANCE MEASUREMENTS

Recommendation: Sewer Maintenance management should:

- Evaluate the appropriateness and value of the current performance measurements being tracked.
- Evaluate whether additional performance measurements should be tracked.
- Document the definition and derivation of each performance measurement used.
- Ensure the performance measurement titles properly reflect the data being reported.

Management Action Plan:

- Identification of improved performance measurements will be considered during development of policies and procedures, with emphasis placed on quantitative cost-benefit analysis, productivity, and resource "leakage" due to external causes (e.g., support for other City Divisions, mandatory training).

Estimated Date of Completion:

- May 1, 2009.

9. PUBLIC REPORTING USING CITY WEBSITE

Recommendation: Sewer Maintenance management should work with the City's Information Technologies Department to address the noted deficiencies in the website menu screens being used by the public to report sewer problems. In addition, Sewer

Maintenance management should request that a sewer overflow category be added in Hansen to allow for differentiation between sewer stoppages and overflows.

Management Action Plan:

- Sewer problems are usually reported via phone call, as the system is generally an all or nothing application (i.e., either the sewage is flowing downhill or it is not) and citizens consider a non-functioning sewer system to be an immediate concern for which they make direct contact.
- Direct contact is preferable in the event of a sewer overflow so that response time is minimized. Staff will request IT provide a phone number for direct contact for notification of perceived sewer overflows.

Estimated Date of Completion:

- April 1, 2009.

10. STANDARD OPERATING PROCEDURES

Recommendation: Sewer Maintenance management should create documented standard operating procedures for its three primary functions to enhance management oversight, improve staff accountability, provide orientation and reference material for staff, and document the institutional knowledge of existing staff in case of employee turnover or extended absences. For purposes of this audit, documented standard operating procedures should be created for the following areas:

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Sanitary sewer private collection component responses (identification of lateral issues and provision of customer service assistance)

- Lateral line customer assistance program

Sanitary sewer overflow (“SSO”) responses (removal of obstructions and restoration of flow, mitigation of contamination, and regulatory compliance reporting)

- NDEP Spill Reporting Policy compliance (see Finding #2)

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- Call Before You Dig program compliance (see Finding #5)

Management Action Plan:

- Applicable operating procedures will be developed and implemented.

Estimated Date of Completion:

- May 1, 2009.