

HOW DO WE GET STARTED PROTECTING OUR UNDERGROUND INFRASTRUCTURE? - LOCK MANHOLES NOW!

Summary Sheet

This first page is a brief review of the article that follows.

There are four **reasons** to lock the manholes now:

- Safety and Liability
- Homeland Security/Terrorist Acts
- Environmental – Clean Water Act – CSO's SSO's
- Preventing Dumping/Lower Maintenance Cost



Use a "*triage style*" risk analysis to **prioritize** which **manholes** to lock first.

- Tier I - Start with locking critical locations such as fire, police, schools, courts, communications, substations, ports, airports, large hotels, convention centers, treatment plants, and other public facilities.
- Tier II - Next, lock manholes in highly populated business and residential areas.
- Tier III – Lock the remaining locations where there is less incentive for illegal access.

To start immediately, **funding** should meet the urgency of the need and should be divided into groups that enables the triage approach.

1. Critical locations can be financed by reallocating existing capital improvement funds.
2. Reallocate user fees and if necessary, increase rate.
3. Apply immediately for Homeland Security Funds and other government grants to supplement agency revenues.

Read on for more details . . .

The Problem

Communities have three primary types of manholes that need to be secured; sanitary sewer, storm, and underground electrical or communication vaults. The problem is anyone with a crow bar can open the manhole cover and enter or dump into the manhole. Terrorists can access storm drain outlets and enter secure areas from manholes.

Manhole covers are being stolen for scrap metal, leaving manholes open to catch unaware pedestrians.

A report on manhole security by a former commissioner of the U.S. President's Commission on Critical Infrastructure Protection predicts a manhole attack will knock-out power and communications collateral in a terrorist scheme. The report examines the underground critical infrastructure and assets, and the corresponding threats and damages, and concludes that Tiers I and II manholes should be secured. Terrorist can dump explosive material such as gasoline and biochemical agents into unlocked manholes within minutes before anyone can act.

Homeland Security Protection Plans warn agencies to lock manholes, holding them responsible for terrorist activities that put emergency services at risk.

When manholes aren't locked, workers routinely pop the cover and dump trash, motor oil, hydraulic fluid, and other contaminants into the system. Grease trucks are dumping into unlocked manholes and leaving within minutes. Manhole covers are not in place during new construction and repaving projects, allowing debris to enter the open manhole. Dumping clogs the small collector pipes and stops the pumps. Sewers overflow.

Overflow from collector systems (SSO's) and combined inflow that includes storm water (CSO's) are released out manholes. The manhole cover allows the overflow to release into the street instead of backing up through the lines and flowing into businesses and homes. The overflow is often uncontrolled until the responsible agency knows there is a problem. The overflowing sewage is mixed with clean water, running into drainage culverts, creeks, rivers, and bays and onto beaches. Contaminated particles seep into ground water.

As health problems arise from the untreated SSO's and CSO's, federal and state environmental protection agencies pass clean water acts. Compliance with the federal and state Clean Water Acts is increasing through enforcement. Local agencies responsible for collection and treatment of sewage are required to report overflows. Failure to report exact amounts and locations of SSO's and CSO's can result in large fines and criminal penalties including jail.

Further safety issues are created when manhole covers are loosened and set ajar by overflows, traffic and heavy equipment, leaving manholes open to catch workers and damage vehicles.

The Solution

The authors of this document have been involved for 35 years in public infrastructure as an attorney and professional civil engineer managing public works departments and sewer districts. As a team, they developed a product for locking sewer manholes based on a thorough understanding of the need to prevent the threat of terrorist, to establish safety, and to prevent dumping. They were encouraged by the communities they served to develop an efficient and economical way to lock the manholes.

The task of locking manholes is now the goal of this team and although the promotion of the product they developed is apparent, the need to lock manholes is urgent, and the message is what is important.

Locking all of the manholes in your community is best achieved by placing a sub-ring a few inches below the existing frame and locking a lid in place that can be stepped on by people. Products that have a mechanism to attach the locking device to the existing frame seize-up over time and are removed during repaving or are not put in place prior to opening the manhole for new construction. For storm manholes, terrorists entering from a pipe outlet can remove other locking devices from below. These products existed and were not adequate at the time the SewerLock product was developed.

Please consider the following information in developing your plan to lock manholes now.

- Although welding the manhole cover shut would prevent terrorist from entering the secured area from a storm water pipe, the

weld must be removed each time the system needs maintenance.

- Research and experience with sewer districts led us to know that the manhole cover cannot be welded or tightened shut or the overflow is not released into the street, but comes up in homes and businesses causing damage and exposure for people to pathogens. By attaching the locking device below the surface designed to slowly release the overflow into the street, it can be seen and contained.
- With the locking device in place, inflow is restricted or redirected away from the manhole.
- If the manhole is locked below the surface, when the existing cast iron cover and frame are removed for repaving or new construction, people and debris do not fall into the opening or enter illegally or dump.

SewerLock is designed to meet the need to lock the cover, eliminate illegal entry, and control overflows as well as inflow of surface water. Properly installed, the locking device will remain for the life of the manhole.

Following are facts associated with ideas for financing, as well as reasons to adopt a plan now to lock all manholes.

SAFETY AND LIABILITY

Just visit YouTube and see how many postings there are of people entering manholes, both on purpose and by accident. See "Fun in the Manhole" and the teenager that falls in after using the cover as a shield in a street fight. Don't miss the whole day event to remove a boy stuck in a manhole, attended by firemen and police. If it is this easy for children to enter manholes, terrorists will have no problem.

A Google search will list numerous incidences of injury and even death from falling into manholes. This year in Philadelphia, a graduate student fell 18 feet into an open manhole and broke his back. He was awarded a multimillion dollar settlement (May 5th 2008 PR news wire Reuters). In today's culture of "zero tolerance for accidents allowed", the urgency increases to lock all manholes now.

In New York recently, the State Appeals Court ruled that the Port Authority was liable for damages caused by the 1993 World Trade Center bombing. The reason; the Port Authority knew about, but chose to ignore, "an extreme and potentially catastrophic vulnerability that would have been open and obvious to any terrorist who cared to investigate and exploit it."

HOMELAND SECURITY

There has been considerable governmental activity mandating the locking of manholes for Homeland Security. Note that the local agencies are responsible.

Recently, the CRS Report for Congress, *Terrorism and Security Issues Facing the Water Infrastructure Sector*, dated July 28, 2008, p.5 contained the warning:

"Large underground collector **sewers could be accessed by terrorist** groups for purposes of placing destructive devices beneath buildings or facility streets. Pipelines can be made into weapons via the introduction of a highly flammable substance such as gasoline through a manhole or inlet. Explosives in the sewers can cause collapse of roads, sidewalks, and adjacent structures and injure and kill people nearby."

<http://www.fas.org/sgp/crs/terror/RL32189.pdf>.

The *2007 U.S. Conference of Mayors passed Resolution 61 -- "Protecting City Critical Assets, Underground Infrastructure and Manhole Security "* -- recognizing the threat to and vulnerability of our underground infrastructure, and the **need to lock manholes**.
http://www.usmayors.org/75thAnnualMeeting/resolutions_full.pdf.

These actions followed five years of acts and directives including the *February 14, 2003 Publication of the National Strategy for Physical Protection of Critical Infrastructure and Key Assets* developed by the Department of Homeland Security Department, which stated that local utilities have primary responsibility for necessary security improvements. This was restated on page 26 in the *National Infrastructure Protection Plan, 2006, "owners and operators represent the first line of defense ... private sector owners and operators **are responsible** for taking action to support risk management planning and investments in security as a necessary component of prudent business planning and operations."*
http://www.dhs.gov/xlibrary/assets/NIPP_Plan.pdf.

Then among other security statements came the May 20, 2003, National Threat Warning System - Homeland Security Information Update - HSAS THREAT LEVEL ORANGE (HIGH); on page 3 agencies are advised to take protective action by **installing special locking devices on manhole** covers in and around facilities. See website http://www.dhs.gov/xlibrary/assets/Threat_Orange_052003.PDF.

Joint guidance from the Department of Homeland Security FEMA and the FBI included a Homeland Security Reference Manual, December 2003, which on page 2-50 states **manholes** greater than 10-inches **must be locked**. This can be accessed on the internet at website http://www.fema.gov/pdf/plan/prevent/rms/426/fema426_ch2.pdf.

December 17, 2003, Homeland Security Presidential Directive 7 (HSPD-7), directing the Federal Departments and Agencies to work with State and local governments and the private sector to identify and prioritize critical infrastructure and to **protect** them **from terrorist** attacks. <http://whitehouse.gov/news/releases/2003/12/20031217-5.html>.

Last year, the U.S. Congress passed legislation and appropriations recognizing the vulnerability of **manholes** and the subterranean infrastructure, **requiring protection**. Now just in the last few months the U.S. Congress has been warned again with the CRS Report on Terrorism and Security that includes manholes.

ENVIRONMENTAL – CLEAN WATER ACT

Federal and state requirements for reporting sewer overflows are now being enforced to gain compliance with EPA laws and regulations. Across the country managers are now at risk of arrest when their organization fails to accurately report the discharge of raw sewage from overflows. A U.S Marshall entered the office and arrested the Public Works Director in a small community in Arkansas, who now faces 3 years in federal prison and a fine of up to \$250,000 for one count of failing to report. More and more communities are incurring civil penalties for not controlling spills.

The CRS Report to Congress, Water Quality Issues in the 110th Congress: Oversight and Implementation, dated September 18, 2008, outlines laws and regulations issued by EPA to implement measures to prevent overflows. Agencies need to install devices to control overflows as well as inflow.

By installing the barrier device in manholes, inflow can be redirected for beneficial uses. Communities throughout the country are developing "Green Infrastructure Projects" to redirect rainwater to beneficial uses. For example, working with EPA and the Sierra Club, local governments have developed topographical funnel areas to direct water to natural drainage channels and bio-retention areas, and rerouting water to areas such as golf courses, landscapes, agriculture fields and grasslands.

PREVENT DUMPING AND MAINTENANCE COST REDUCTION

Unauthorized persons can use unsecured manholes to dump material that can quickly cause damage. An example of how easy it is to disrupt an underground facility is demonstrated by what happens when grease is dumped in sanitary sewers. On July 29, 2008, the Press Telegram Long Beach reported that, "Sewage Spill Blamed on Grease Blockage," detailing the following sewer spills:

- A spill that leaked 12,000 gallons of raw sewage into Spinnaker Bay near Marine Stadium was caused by a grease blockage in a sewer pipe forcing the City of Long Beach to close down beaches and cancel an annual swimming event.
- A spill near downtown LA dumped 73,000 gallons of raw sewage into Los Angeles River closing beaches on the Peninsula.
- 16,000 to 17,000 gallons of sewage spilled in Glendale and flowed down the Los Angeles River, closing a 1.75 mile stretch west of Belmont Pier.
- A 300-gallon raw sewage spill, possibly caused by vandalism shut down Alamitos Bay and Colorado Lagoon for about three days.
- The Long Beach Water Department cleans more than 760 miles of sewer systems every two years; problem areas such as central Long Beach and Belmont Shores require maintenance every 90 days; cost to Long Beach was \$400,000.
- A similar occurrence was reported in Santa Clara County, California: Grease hauler dumped 8000 gallons of grease from a restaurant into Adobe Creek requiring crews two days to clean up "Fats, Oils, and Grease – Grease Haulers", City of Palo Alto Website.

Prevention is more important than catching the dumpers. The cost of prosecution is substantial and even when caught red-handed many go

without penalty. The cost of cleanup and the risk of penalties for the sewer agency are significantly greater than the cost of prevention. **An agency's entire bank account can be wiped out by one incident.**

RISK ANALYSIS – WHICH TO LOCK FIRST?

Divide the total manholes into three risk categories. By assigning a risk factor and dollar value, a priority list can be developed for determining the order for locking.

- Tier I - Start with locking critical locations such as around fire, police, schools, courts, communications, substations, ports, airports, large hotels, treatment plants, and other critical facilities. Also includes areas of high storm water inflow and locations susceptible to dumping.
- Tier II - The second category includes high population areas like high density business and multi-family neighborhoods where open manholes are an invitation for trash dumping and present safety issues.
- Tier III – The third category includes rural areas where manholes exist without a history of problems from dumping and offer little incentive for unauthorized entry including kids and terrorists.

After completing Tier I then all manholes that cannot be readily included in the third group, Tier III, are reviewed and those with the highest concern are reevaluated and tagged onto the first or second group. Funding will determine how quick all manholes in all groups are locked.

Consider using discretionary money to lock your 12 highest priority manholes during the time the risk analysis is being prepared. Most city and district sewer maintenance staff can name 12 manholes that should be included in the “dirty dozen”.

FINANCING AND IMPLEMENTATION

To start immediately, consider funding to meet the urgency of the need and divide financing into groups that enable the triage approach.

Consider financing from three sources, 1/3rd from existing capital improvement funds, 1/3rd from additional user fees, and 1/3rd from Homeland Security Grants and other government funds.

1. Critical locations can be financed by reallocating existing capital improvement and Homeland Security funds.
2. Reallocate user fees and if necessary increase rates.
3. Apply immediately for future Homeland Security Funds and other government grants to supplement agency revenues.

Homeland Security Grants and other government funds have been awarded for locking manholes and are available in the future for agencies to use to complete the work and to replace the funds borrowed from the operations, maintenance, and capital improvement budgets.

Recently three cities in the U.S. were given grants from Homeland Security Funds to lock manholes. The process has begun for FY2009 Funding and now is the time to start locking manholes.

County Office of Emergency Services requests that cities and districts submit a standard application to request grant money for locking manholes.

Agencies should contact the Office of Emergency Services to request applications for FY2009 Funds now to be in line for the next funding period. The standard form can be accessed from the Governor's website and assistance is provided by the emergency office or us.

For \$285 per connection, all manholes can be locked. Using existing funds, user fees collected over time, and government grants, agencies can begin to protect the underground infrastructure.

**See the solution we developed for our clients at sewerlock.com.
Call us for help.**

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