Source: http://www.doulton.ca/asbestos.html

Asbestos

400,000 Miles of Drinking Water Pipes May Have Been Made With The Deadly Substance

by Barbara Robson

The prospect is chilling: by best estimates, about 20 million people have had significant exposure to cancer causing asbestos on the job. Three hundred thousand Americans are expected to die of asbestos related cancer in the next twenty to thirty years. Now, the deadly substance is contaminating drinking water around the continent.

Asbestos is one of the most potent carcinogens known to man. Cancer now claims at least one life an hour among people who inhaled it on the job. As many as 200,000 wives and children of asbestos workers will also grow ill merely from washing asbestos laden clothes or being exposed at their homes. Many of these people do not know that they can file a lawsuit to combat the expensive medical costs associated with lung cancer.

The American Congress passed legislation in 1984 to control asbestos hazards in the building materials of 31,000 schools attended by some 13 million children. And asbestos is present in millions of houses, apartments and buildings.

Now, alarming levels of invisible, needle like fibers of asbestos have been discovered in tap water. Much of it comes from an estimated 400,000 miles of asbestos cement water pipe. Enough to circle the globe sixteen times. Buried beneath hundreds of North American cities.

Yet scientists and government officials can not agree on how serious this hazard actually is, or even on what levels are acceptable. "We believe asbestos breathed is a definite carcinogen", says Dave Ryan, a press officer for the Environmental Protection Agency, "but as far as asbestos in water, the jury is still out".

The people of Woodstock NY know the worry first hand. In late 1985, so much asbestos was in the tap water that it clogged the town's pipes. Health officials warned citizens not to drink the water, to limit showers and to keep asbestos contaminated water out of humidifiers.

Tara Roberts, a thirty one year old business woman and mother, is the leader of the citizen's group Asbestos Free Woodstock. When she first heard Woodstock's health warning, she thought of her one year old daughter, who had had a cold. On her pediatricians advice she'd covered the crib and put a vaporizer beside it.

"I realized that the vaporizer was probably putting asbestos into the air she breathed," Robers grimly recalls. "I was horrified." For over a year, she has hauled gallons of clean water home, taken dirty clothes to a laundromat that uses well water and showered at the houses of friends with safe water.

Roberts states the 1980s message from the famous town of Woodstock: "Any community with asbestos cement pipe either has a problem or will soon have one."

In the past decade, asbestos contamination in drinking water has been discovered in communities throughout North America. In 1982, Department of Health and Human Services survey of 538 US cities showed sixty five

percent of them had some asbestos in their water. Almost nine percent had levels that health experts say should have signaled concern.

In Connecticut, a state that banned installing new asbestos pipes seven years ago, 900 miles of asbestos laden pipe is still in the ground, supplying drinking water for over 600,000 people. The Detroit News informed 4 million water drinkers that 1100 miles of the pipe that lay beneath them showed more than 3 million fibers in a quart of tap water.

Asbestos cement water pipes may be anywhere in North American, from Winnipeg Canada to Texas, and, depending on its condition may cause people to swallow from a few hundred to hundreds of millions of fibers every day.

Dr. Philip Landrigan is the director of Environmental and Occupational Medicine at the Mount Sinai School of Medicine in New York. "Houses built between 1950 and 1980, when asbestos cement pipe was in vogue have a good chance of using water from these pipes, but on one is certain as developers records are imperfect and good data is incomplete."

Unfortunately all too little is being done. Water utilities typically deny any risk for fear of liability. Occasionally the utilities even deny they used asbestos cement pipe. Two decades ago, asbestos cement pipe producers, including former industry giant Johns-Manville, attempted to fix the problem. With Food and Drug Administration approval, they sprayed a vinyl liner inside asbestos pipe and subsequently sold miles of treated pipe throughout New England. A few years ago, tetrachloroethylene, a chemical known to produce cancer in test animals was found to be leaching from the vinyl lining into the water. By 1980 when Manville finally took its vinyl lined asbestos pipe off the market, 1000 miles were buried in New England and New York.

Asbestos cement pipe producers paid for reports that advised water utilities to treat highly acidic water flowing through their pipes. Acidic water can cause the cement to disintegrate, which can result in the release of asbestos fibers.

On almost all fronts denial of the asbestos hazard in tap water seems to run deep. In ostrich like fashion city officials seem to be pretending that because they can't see the asbestos fibers in the water, little need be done. Winnipeg, a prairie city of over 600,00 is a case in point.

Sixteen years ago, **Dr. Francis Konopasek**, a physics professor at the University of Manitoba studying asbestos levels in wine and beer wondered if the deadly mineral might be making its way into Winnipeg's drinking water. Upon inquiring he was told, incorrectly, that asbestos pipe was only used to carry sewage, not water. In 1979, a Canadian government report showed that Winnipeg's drinking water was indeed tainted by asbestos. The city had almost 400 miles of asbestos cement pipe in the ground for nearly half a century. Over the next few years Winnipeg tested asbestos levels in its drinking water. In 1983, the year before sampling was stopped, a quart of Winnipeg drinking water contained 12 million fibers

In the winter of 1986, facing public outcry, the city finally banned further installation of asbestos cement water pipe. But it also brought in Joseph Cotruvo, director of criteria and standards in the EPA's office who gave a different view of the risk. "A multi million dollar study found the weight of evidence is slight that ingested asbestos causes cancer". Not surprisingly, environmentalists were unconvinced.

Unfortunately industry and government officials have been able to hide behind the fact that no adequate studies exist to measure the debilitating effects of drinking asbestos contaminated water. Dr. Irving Selikoff, the world's leading expert on asbestos related disease says that there are sound scientific reasons to suspect a cancer risk from asbestos in drinking water.

In November of 1985 the EPA proposed a nationwide standard for asbestos in drinking water. It stated that consumer protection was needed only when more than 7 million fibers per quart were found, and only when those fibers were long, which means longer than ten microns. In other words the EPA was assuring everyone that hundreds of millions of fibers shorter than ten microns were dandy to swallow!

To get to that dubious position the EPA shunted aside its own 1980 estimate of risk, as well as the advice of its own science advisory board and the opinion of the National Research Council. Instead it turned to a single animal study showing that asbestos Feb. in pellet form to rats was barely carcinogenic.

The author of that study, Ernest McConnell of the National Toxicology Program has acknowledged his surprise. "We would never regulate fibers longer than ten microns, based on my asbestos findings".

According to Mount Sinai's Dr. Landrigan, the EPA is misguided in its attempt to pretend that the short fibers are benign. Furthermore, the Natural Resources Defense Council, a group of scientists and lawyers with a strong track record in fighting for clean water supplies, charges that the EPA is allowing a risk 10,000 times greater than is prudent.

Also in November 1985, the EPA officially conceded that humidifiers could add to the hazard posed by asbestos contaminated water.

In drinking water the cancer risk seems to depend on the amount of asbestos swallowed. When you take a little asbestos and send it out to other parts of the body no one site is going to have very much, therefore the risk theoretically should be low. Asbestos has however, one very dangerous quality, as it accumulates in the body; the microscopic fibers lodged in tissues can remain like little time bombs and cause cancer years later. Since asbestos exposure is cumulative, young people are in particular need of protection. "Adults have three or four decades to develop cancer after exposure", says Dr. Landrigan. "The kids have six or seven. this means that a smaller dose of a carcinogen is as dangerous to the kids as a larger dose of it is to adults".

Controlling asbestos so that standards are met is critical. In Woodstock, pipes crumbled so badly that the proposed standard was exceeded. In one 1985 sample, 300 million fibers of every length were found per quart.

As thousands of other North Americans become suspicious of what level of asbestos may be in their drinking water, the big question is how to take preventive measures. At the very least, water districts should be required by law to tell consumers what type of pipe transports their precious commodity and before major problems erupt they should be required to test their water. If necessary districts should be required by law to quickly remove the pipe, just as schools have been required to remove asbestos pipe and insulation/tiles. Failure to do so dooms millions of people to become test animals in a massive biological experiment involving a known carcinogen.

: Barbara Robson was a reporter at the Winnipeg Free Press in Canada when this investigative report was first written and published in U.S February 1987

Note: Cement-Asbestos water mains are sometimes referred to as **AC pipe**

Source: http://www.theglobeandmail.com/report-on-business/pipes-with-asbestos-still-used-in-new-buildings/article19357158/?page=all

Pipes with asbestos still used in new buildings

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pes containing asbestos are being installed in new condominiums, hospitals and high-rises in Canada, despite widespread health concerns that have led many countries to ban its use.

The new installations come as cities across the country are spending millions of dollars to manage and remove asbestos materials from public buildings such as schools, community centres, courts and medical facilities.

Unlike most other developed countries, Canada has never banned the use of asbestos and continues to import and export asbestos-containing materials, such as pipes and tiles, The Globe and Mail has reported.

Asbestos-cement pipes are allowed in both Canada and the United States, though there are regulations about how to cut and dispose of them. It is unclear how many asbestos-cement pipes are being installed in Toronto and other cities, and there appear to be no central records of where asbestos is being used. Once the products are imported into Canada, it's difficult to pinpoint where it actually gets sold. A key concern is that many workers, tenants and owners may not know asbestos materials are in their buildings, raising the risk of accidental exposures particularly in the event of a fire, or as the materials start to deteriorate.

The World Health Organization has declared all forms of asbestos carcinogenic and recommends its use be eliminated. In Canada, asbestos has become the top on-the-job killer, causing diseases such as mesothelioma and asbestosis. Evidence has found even low levels of exposure raise the risk of cancer.

The distributor of some of the pipes is Portneuf, Que.-based Tuyaux Logard Inc., whose owner said Toronto is a key market for the company.

All of Logard's pipes contain asbestos. They are imported from other countries including Mexico, while Logard cuts and distributes them to contractors in Canada. The company, which employs about 25 people, wouldn't disclose its revenue or volumes imported for competitive reasons. But Statistics Canada trade data show Canada imported about $2.2-million in asbestos-containing pipes, tiles, sheets, panels and tubes from 2010 to 2013.

Logard also supplies contractors through Ontario and Quebec, and on occasion, the Maritimes, the company's owner Louis Beauregard says.

Another recent customer was the McGill University Health Centre, he said, a billion-dollar-plus, Montreal mega-hospital which was built by SNC-Lavalin. SNC-Lavalin said in an e-mail the pipes are used in stormwater drainage and noted the only risk with this type of pipe is "when it is being cut upon installation," a risk that is regulated by the province . "There are no risks associated with this type of piping once installation is completed," the company said.

Logard is not the only supplier of asbestos-cement pipes in Ontario. Brampton-based Crowle Fittings and Supplies distributes them through the Greater Toronto Area as well (imported from Mexico) and says a "good

majority" of the high-rise buildings going up in Toronto are using them, in parking garages or running up to the roof.

Some provinces have boosted restrictions on asbestos, which has curtailed use. In British Columbia, "tightened current regulations have generally stopped the current use of asbestos-cement pipes," said Al Johnson, vice-president of prevention services at WorkSafeBC. The issue of safe use has surfaced at Ontario's Ministry of Labour. The ministry said in an e-mail that it has encountered cases of employers or contractors who are not following the rules, noting that in those cases a provincial inspector can stop the job. "It is always a concern for the Ministry of Labour when asbestos is being installed or removed in a workplace," the ministry said.

The Globe and Mail visited a dozen construction sites in Toronto, Markham and Vaughan, from luxury condos to commercial offices. Asbestos-cement pipes were being installed in at least eight of the sites, principally for drainage. The pipes were stamped with the word "asbestos" on them.

The concern, people in the industry say, is that proper procedures are not always followed and that the fibres could become airborne, endangering both workers on the site and future occupants in buildings.

Tom Kelly, president of Inscan Kaefer Inc., an insulation and asbestos abatement company, says it's incongruous he's being asked to remove precisely the same types of pipes that are now being newly installed.

"The regulations are largely geared to removing it," Mr. Kelly said. "We weren't anticipating that new piles of this stuff would be installed."

Mr. Kelly is concerned that a lack of awareness among workers will lead to inadvertent exposures during installations. He also has specific concerns: that the improper use of a handsaw or power saw could generate dust; that, even if a site is wet, fibres could become airborne as it dries; that waste or cut-off pieces of pipe are not being disposed of properly; and that workers may be cutting and working with parts of pipes that don't have the asbestos stamp on them.

Regulations stipulate that owners keep a record of all asbestos-containing materials in a building and that tenants and contractors be notified of their presence in the area. He's worried that's not happening. "This would pose a future risk if, for example, maintenance workers are not aware of the requirements for working with the product."

Developers may not be aware asbestos materials are being used in construction. "The developers themselves, a good number of them probably wouldn't know what's going on in the garage drainage system," said Michael Steele, director of technical standards at the Residential Construction Council of Ontario, which represents builders in the province.

Asbestos-cement pipes may also be known as transite or fibrocement pipes.

Logard's Mr. Beauregard says the pipes are safe, provided workers take precautions such as using a snap or crack saw, wearing a proper mask and keeping the site damp while cutting. The pipes his company sells are 13-per-cent asbestos .

Crowle's Ken Dyble acknowledges that not everyone may be following proper procedures. "There is still a concern that somebody's going to take a quick-cut saw to it and we don't like seeing that happen. Most people are using chain or snap cutters now," he said. "You're always going to have somebody that's going to do something stupid, unfortunately; it's like that with every product."

Logard's Mr. Beauregard says safety concerns are out of touch with modern-day practices and there is little risk if proper precautions are followed. "I just question how some people arrive at the conclusion that it's impossible

to work with cement pipes or asbestos cement pipes safely," he said in a June telephone interview with The Globe.

He said the key advantages of asbestos-cement pipes are that they are less expensive, quieter, stand up better to heat and freezing, and are flame retardant. His pipes are mainly used for industrial, commercial and high-rise buildings , he said.

The World Health Organization notes that asbestos cement is a "particular concern" because it's difficult to control exposure and because of the potential for materials to deteriorate over time.

By contrast, the federal government's long-standing position is one of safe and controlled use of asbestos. Some workers are concerned the stamps fade over time and that shortened pieces of the pipe won't have those labels.

Rolf Priesnitz, director of Centre for Construction and Engineering Technologies at George Brown College, says the chief concerns about asbestos pipes are that fibres could become airborne during the installation process and that these pipes will in future decades break down, leaching asbestos into the city's water system.

Safer alternatives include cast iron, plastic and ordinary cement pipes, he said. "I don't see any reason whatsoever in this day and age to have anyone install transite pipe. You have alternatives that are better," he said.

In the long run, "it is a concern for people who maintain buildings with asbestos pipe or if fire or other disasters damage the pipe or when the building is torn down," says Paul Demers, University of Toronto professor in public health and director at Cancer Care Ontario.

Several papers published this year have found elevated cases of mesothelioma (a form of cancer caused almost exclusively by asbestos exposure) among firefighters, which in turn "supports the fact that when buildings burn, asbestos can be released from building materials," he said, adding that fibres can also be released from deteriorating pipes.

The high cost of managing and removing asbestos in buildings is another reason some would like to see asbestos use eliminated. "Life would be a lot easier if you could say, 'I just built an asbestos-free building,'" said Mike McCoy, director of facilities management for the City of Toronto, adding that it's tricky to know which materials have asbestos.

The continuing use of asbestos pipes is a concern to Fred Clare, who has worked with asbestos since 1970 and watched a dozen of his colleagues die of asbestos-related diseases.

"I don't want my children and grandchildren having to do what I did. This material has to be banned," said Mr. Clare, vice-president of the International Association of Heat and Frost Insulators and Allied Workers, which used to be called the union of asbestos workers. "Are we going backwards now, in seeing it installed again?"

With reports from Tara Perkins and David Hains in Toronto

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ASBESTOS CEMENT PIPE: WHAT IF IT NEEDS TO BE REPLACED?

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ABSTRACT: Asbestos cement (AC) pipe, also known as "transite," was a popular choice of engineers for potable water, sanitary sewer, and storm drain pipelines during the 1940s, 1950s, and 1960s. AC pipe was touted for its light weight and ease of handling, low coefficient of friction (Manning's "n" = 0.010), and corrosion resistant properties. An estimated 600,000 miles of AC pipe were installed in the U.S. and Canada.

Due to health concerns associated with the manufacturing process, production of AC pipe ceased in the United States in the early 1970s. The U.S. Environmental Protection Agency (EPA) issued a complete ban on all asbestos-containing products in 1979, but was defeated in the U.S. Fifth Circuit Court of Appeals and the ban was lifted. The Court did, however, reinforce the EPA's responsibility to regulate asbestos.

Hundreds of thousands of miles of AC pipe are beyond or are approaching the end of their 50-year design lives. Two very effective technologies for replacing AC pipe are pipe bursting and pipe reaming. However, existing regulations limit the use of these trenchless construction methods.

Many public agency officials and engineers are not familiar with the regulations restricting pipe bursting and pipe reaming of AC pipe. Regulatory application is not consistent from one state to the next, or even within the same state in many instances. Enforcement is occurring much more frequently; however, and it is important for those in our industry to clearly understand the restrictions. This paper will examine the regulations on AC pipe rehabilitation and replacement, evaluate the impacts of the restrictions, and discuss the current position of the regulators.

INTRODUCTION

Asbestos cement (AC) pipe became a viable option for water, wastewater, and storm drainage systems beginning in the mid-1940s. The materials used to fabricate AC pipe included Portland cement, up to 12 percent asbestos fibers, water, and silica or silica-containing materials. The pipe was formed under pressure and heat cured in an autoclave. The presence of the asbestos fibers in lieu of reinforcing steel provided adequate strength with lower weight. In addition to its light unit weight, AC pipe was marketed as having very good resistance to the effects of hydrogen sulfide corrosion and soils that were aggressive to steel, and low operating costs because the smooth walls of the pipe provided low friction factors. The major U.S. manufacturers of AC pipe are shown in Table 1.

Table 1. Manufacturers of Asbestos Cement Pipe

Company Name	Headquarters Location
Cement-Asbestos Product Company	Woodward, Alabama
Certain-teed Products, Company	Ambler, Pennsylvania
Flintkote Company (Orangeburg Mfr. Div.)	Orangeburg, New York
Johns-Manville Company	New York, New York

AC pipe was manufactured in four different classes, for various applications. Each type of pipe was manufactured to specific ASTM standards. The individual characteristics for each material are shown in Table 2. Each section of pipe and each fitting were marked with the size and pipe class, manufacturer's

name or trademark, and date of manufacture. Each rubber gasket was also marked with the manufacturer's trademark and date of manufacture.

Table 2. Characteristics of Asbestos Cement Pipe

Type of Pipe	Typical Use	ASTM Standard	Size Range (in.)	Crush Strength (lb/ft)	Pressure Class (psi)
Nonpressure	Sanitary sewers	C 428	4–42	1,500–7,000	--
Pressure	Local water mains, sewer force mains	C 296	4–18	4,100–17,400	100, 150, 200
Storm Drain	Storm drains	C 663	4–42	1,500–3,750	--
Transmission	Water mains	C 668	6–42	2,000–42,000	300–900

Due to its light unit weight, relatively low installation cost, superior corrosion resistance, and low friction factor (Manning's "n" = 0.010), AC pipe was very popular during the 1950s, 1960s, and early 1970s. Vitrified clay pipe provided a competitive alternative for use in sanitary sewer systems, but AC pipe soon became the pipe of choice for water and storm drainage systems. A survey conducted by the American Water Works Association (AWWA) in 2004 found that, on average, AC pipes constitute approximately 15–18 percent of the nation's water distribution and transmission systems. In North Carolina, AC pipe comprises nearly 5,000 miles of pipeline or approximately 6.5 percent of all water mains installed. The amount of AC pipe installed in various entities within North Carolina ranges from zero to ninety-eight (98) percent. This illustrates that there is a substantial quantity of AC pipe installed in North Carolina and is quite prevalent in some communities.

Communities that experienced significant growth during the 1950s and 1960s, however, constructed their infrastructure systems when the use of AC pipe was prevalent. These cities have percentages of AC pipe that are much higher than the national average, especially if one or more AC pipe manufacturing facilities were located nearby. Through our research, we found that AC pipes comprised from 50-80% of typical storm drain systems in the western U. S. and Canada; water systems included 40-75% AC pipes; sewer systems included 10-25% AC pipe (mostly in force mains). Usage rates as found through our literature search for the various systems are shown in Figure 1. As a comparison, the AWWA survey of 50 responding communities (mainly large municipalities in the eastern U. S.) reported that 15% of infrastructure systems are comprised of AC pipe as a national average. Overall, it is estimated that more than 600,000 miles of AC pipe are in use throughout the U.S and Canada.

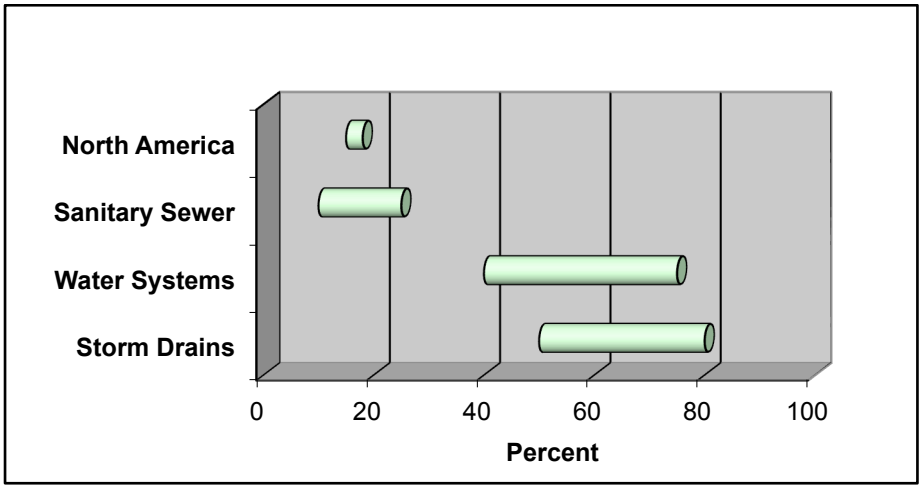

Figure 1. Asbestos cement pipe was used extensively in water and storm drainage systems built between 1950 and 1969

Under certain conditions, AC pipe has experienced failures at rates that are similar to other pipe types during their 50-year design lives. However, many public agencies have reported significantly higher failure rates for AC pipe than for other pipe materials. Ironically, the major factor in predicting failures of AC pipe appears to be aggressive soils—one of the conditions that AC pipe was supposed to protect against. Overall, however, studies have shown that the failure rate for AC pipe increases dramatically with age. After 50 years of use, AC pipe failure rates are about one per year per mile of pipe.

THE HISTORY OF ASBESTOS REGULATION

In 1973 the National Emissions Standards for Hazardous Air Pollutants (NESHAP) was implemented by the United States Environmental Protection Agency (EPA) when it was determined that asbestos was a leading contributor to asbestosis and certain forms of cancer. Through NESHAP, the EPA sought to protect the public by controlling exposure to asbestos during the milling, manufacture, common use, spraying, renovation, demolition, and disposal of more than 3,000 asbestos-containing products.

Effectively regulating such a large class of diverse products proved to be a daunting task. In 1979 the EPA announced its intent to ban all asbestos-containing materials. By 1986 the EPA proposed a rule to ban asbestos. The EPA's Asbestos Ban and Phaseout Rule was published in the Federal Register[1] in 1989, proposing to eliminate all asbestos-containing materials in three stages between 1990 and 1997.

The Asbestos Information Administration and the Asbestos Institute (with major funding from the government of Canada) conducted significant lobbying efforts against the Asbestos Ban and Phaseout Rule. One large manufacturer of asbestos-containing products, Corrosion-Proof Fittings, successfully sued the EPA to block implementation of the ban. The U.S. Fifth Circuit Court of Appeals ruled that the EPA had failed to present a compelling case for banning all asbestos-containing materials. The Court did, however, reinforce the EPA's responsibility to regulate asbestos, and new products containing asbestos were banned.

The impact on the asbestos pipe industry was uncertainty and fear. After 1973, the asbestos fiber content in AC pipe was reduced from 12 percent to less than 0.2 percent. By the 1980s the popularity of AC pipe had waned dramatically due to fears of liability and the availability of PVC pipe. Manufacturers stopped producing AC pipe in the United States; however, the machines were moved to other countries (including Mexico and Saudi Arabia), and AC pipe is still produced and available today.

ASTM Subcommittee C17.03 remains active and tasked with maintaining a series of ASTM specifications related to the manufacture, installation, and testing of AC pipe. Table 3 lists the ASTM specifications for AC pipe.

Table 3. Asbestos Cement Pipe ASTM Specifications

Specification Number	Subject
C296	Pressure Pipe
C428	Non-pressure Sewer Pipe
C458	Organic Fiber Content
C500	Test Methods for AC Pipe
C663	Storm Drain Pipe
C668	Transmission Pipe
C966	Installing AC Non-pressure Pipe
D1869	Rubber Rings for AC Pipe

Table 4 shows the AC pipe standards promulgated by the American Water Works Association (AWWA). In November 2008, the AWWA withdrew its AC pipe standards.

Table 4. Asbestos Cement Pipe AWWA Specifications

Specification Number	Subject
C400	Pressure Pipe, 4”-16”
C401	AC Pipe Selection, 4”-16”
C402	Pressure Pipe, 18”-42”
C403	AC Pipe Selection, 18”-42”

REGULATIONS FOR AC PIPE

In most states, public agencies are *not* required to remove and replace AC pipe. Studies have indicated that, in normal use, AC pipe does not pose a threat to public health; however, certain activities—including tapping, cutting, crushing/removing, and disposing—are regulated.

Contrary to common belief, in many states specially licensed contractors are not required when working with AC pipe. Many states have developed programs to train individual employees in safe practices involving the regulated AC pipe practices. These training programs provide an employer exemption for registration requirements. In addition, guidelines have been established for licensing of course providers in order to extend the available training resources while maintaining consistency in content and message.

The EPA has addressed replacement of AC pipe using the pipe bursting method. In a letter issued July 17, 1991, the EPA stated its position that “the crushing of asbestos cement pipe with mechanical equipment would cause this material to become ‘regulated asbestos containing material’ (RACM)” and “. . . the crushed asbestos cement pipe in place would cause these locations to be considered active waste disposal sites and therefore, subject to the requirements of §61.154 (NESHAP).” Furthermore, in this same letter, the EPA goes on to advise that “In order to avoid the creation of a waste disposal site which is subject to the Asbestos NESHAP, the owners or operators of the pipe may want to consider other options for dealing with the abandoned pipe.” Since the EPA’s letter did not specifically identify pipe bursting, interpretation of the intent was inconsistent throughout the industry.

260-foot Exclusion: NESHAP includes an important exclusion for pipeline replacements. This exclusion allows single renovations of up to 260 linear feet or within a calendar year for nonscheduled operations. Although the exclusion was likely intended to allow some flexibility for small replacement projects, the exclusion also provides us with the opportunity to pilot test rehabilitation methods for AC pipe and test the impacts of construction.

CURRENT EPA ACTIVITIES

Key EPA staff members continue to survey the industry to learn about pipe bursting, pipe reaming, and AC pipe. They are trying to gain an in-depth understanding of the rehabilitation techniques in order to determine the extent to which pipe bursting or pipe reaming of AC pipes constitutes a threat to public health. They are also trying to determine whether existing restrictions are reasonable (either too much or too little).

Currently, the EPA staff has expressed a preference for pipe reaming over pipe bursting because reaming can remove a portion of the asbestos pipe fragments through the downstream receiving pit. Pipe bursting, on the other hand, leaves all of the broken pieces of pipe entombed in the soil surrounding the new pipe. Concerns seem to be centered on possible exposures during future excavations.

A pair of Florida contractors have recently (separately) approached the EPA in Washington D.C. to request issuance of a perpetual notification determination that would allow pipe bursting of AC pipe in the

State of Florida. EPA, through their lawyers and biologists, wanted to know what studies had been done to guarantee that the asbestos fibers wouldn't migrate up through the soil, groundwater and pavement to become airborne. Based on the meetings to date, EPA is willing to allow pipe bursting on a case-by-case basis, but it will not issue a unilateral exemption from notification of the potential impacts inherent to this type of project.

Independently, organizations such as the Government Regulations Subcommittee of the International Pipe Bursters Association (IPBA) are trying to develop a science-based argument with which to approach the EPA. The goal is to convince the EPA to modify the AC pipe regulations to specifically address the public health impacts of replacement by pipe bursting or pipe reaming. In the meantime, the EPA and local air quality boards are aggressively enforcing current restrictions.

SPECIFIC STATE REGULATIONS

The EPA has delegated administration and enforcement of asbestos regulations to many of the individual states. Program administration often falls to a statewide department that enforces many environmental policies. In North Carolina, enforcement of the NESHAP regulations is managed by the Health Hazards Control Unit of the Division of Public Health of the North Carolina Department of Health and Human Services. There are also three local programs in the State of North Carolina responsible for enforcing the NESHAP regulations within their jurisdiction. These three programs are the WNC Regional Air Pollution Control Agency of Buncombe County, the Environmental Affairs Department of Forsyth County, and the Department of Environmental Protection of Mecklenburg County.

As the title of this paper poses, if a segment of asbestos cement pipe needs to be replaced, what are the requirements? Under the North Carolina rules, individual asbestos removals where 160 square feet, 260 linear feet, or 35 cubic feet or greater of RACM is to be demolished or renovated, a permit application is required.

Policies in other states are different. In South Carolina, a project license for the work to be performed must be obtained before beginning work and any person or contractor engaged in this activity must be RACM licensed. In Arizona and New Mexico, AC pipes can be replaced by pipe bursting or pipe reaming following filing of a notice of intent. In Oregon, specially licensed abatement contractors are required to remove and dispose of AC pipe. Oregon is also the only state that requires all AC pipe to be removed if it is exposed for any reason. In Nevada, New Jersey, and New York, specially licensed contractors are required for any work (including taps) performed on AC pipe.

PIPE BURSTING VS. PIPE REAMING FOR AC PIPE

Pipe bursting is a construction method that allows an existing pipe to be replaced with a new pipe of the same or larger diameter with limited excavation. Several different types of equipment, including static, pneumatic, or hydraulic equipment, are available to break the host pipe and pull or push a new pipe into the open cavity. As recently as 2010, the EPA cited pipe bursting as an effective means for rehabilitating force mains[2] and wastewater collection systems[3].

Pipe reaming is similar to pipe bursting in that it is a process to replace an existing pipe with a new pipe of the same or larger diameter; however, the equipment used to create the cavity involves modified horizontal directional drilling equipment. Whereas in pipe bursting, the host pipe is broken into fragments and pushed into the surrounding soil, in pipe reaming, the host pipe is ground into smaller fragments.

During pipe reaming, drilling fluid is pumped into the borehole to flush pipe fragments and soil to the downstream receiving pit. The mixture of mud, soil, and pipe fragments can be collected for disposal. When the host pipe is AC, the collected mixture must be containerized and disposed of at an appropriate landfill site. This ability to contain and appropriately dispose of the AC pipe fragments is the primary reason that the EPA favors pipe reaming. To date, no studies have been done to quantify how much of the pipe is recovered during reaming, but an EPA staff member was quoted in offering an opinion that up to 90% of the pipe fragments may be removed.

Whereas pipe reaming is a patented process, the patent on pipe bursting has expired. There are far more contractors who are experienced pipe bursters. The number of projects completed by pipe bursting is much greater than pipe reaming. Only a few projects resulting in installation of pipes over 18 inches have been performed by pipe reaming. Pipe bursting can be used to install pipe up to 48 inches in diameter. The unit cost of pipe bursting is less than pipe reaming.

Certain EPA staff members are of the opinion that matters such as number of contractors, installation size range, and cost are market driven. If there is more demand for pipe reaming, then more contractors will become licensed and experienced, resulting in a wider installation range and more competition (leading to lower costs).

THE FUTURE OF AC PIPE REPLACEMENT

Hundreds of thousands of miles of AC pipe are reaching the end of their 50-year useful lives and will need to be replaced soon. Each engineer, contractor, and public official responsible for replacing AC pipe should be aware of the policies in place in the area where they work.

Since the EPA is soliciting input from the industry prior to revising existing regulations regarding replacement of AC pipe, now is an excellent time to contact the EPA to offer the benefit of your knowledge and to voice your opinions. These revisions are critical to our industry and it is important that the EPA have all of the available information in order to make prudent decisions.

The Water Research Foundation is currently leading a study to establish tools to predict the long term performance of AC pipes. Additional research is underway to develop bentonite lubricants that solidify after pipe installation to form a conglomerate with the pipe fragments, similar to a controlled low-strength material used for backfill. Such a product could substantially reduce the risk of future exposure to friable material.

Administrative procedures need to be developed to ensure that AC pipes replaced by either pipe bursting or pipe reaming are adequately marked so that maintenance activities can be properly planned and safely performed. Using the 260-foot exclusion, testing should be conducted to definitely determine the condition of pipe fragments remaining in the soil and the extent of pipe fragment removal accomplished.

REFERENCES

1. Federal Register, Volume 59, pg 41027, August 10, 1994.
2. State of Technology Report for Force Main Rehabilitation United States Environmental Protection Agency, Office of Research and Development, EPA/600/R-10/044, March 2010.
3. State of Technology for Rehabilitation of Wastewater Collection Systems, United States Environmental Protection Agency, Office of Research and Development, EPA/600/R-10/078, July 2010.