Applicability of National Emissions Standards to Rehabilitate Asbestos-Cement Pipelines

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The United States is currently facing significant deficits in drinking water and clean water infrastructure operation, maintenance, and capital costs. A significant amount of the existing infrastructure is asbestos-cement (A-C) pipe, and rehabilitation of the pipe is restricted by regulations that are almost 30 years old and do not account for advancement in new technology. The A-C pipe is considered to be a Category II nonfriable asbestos-containing material, according to the National Emissions Standards for Hazardous Air Pollutants (NESHAP). Rehabilitating buried A-C pipelines is subject to NESHAP and according to regulators, if the pipe is crumbled, pulverized, or reduced to powder, and the length is at least 260 lineal ft, it falls under NESHAP guidelines. However, NESHAP does not address pipe bursting or any other rehabilitation method other than direct removal and does not include clear requirements for rehabilitating buried A-C pipelines in public right-of-ways.

There have been great strides made in technological advancement since NESHAP was issued. Killebrew Inc. arranged for industry members to travel to Washington, D.C., in order to meet with U.S. Environmental Protection Agency (EPA) staff for the purpose of discussing NESHAP and its applicability to rehabilitating buried A-C pipelines using pipe bursting technology. This article presents: (1) the technological advancements in industry practices and NESHAP requirements for rehabilitating buried A-C pipelines; (2) recent communications with EPA and industry representatives; and (3) plans for the development of an EPA administrator-approved alternate, as provided for in NESHAP, that specifically addresses rehabilitating buried A-C pipelines via pipe bursting.

Origins of Asbestos Pipe

Asbestos, a naturally occurring mineral fiber, was used extensively in many building materials prior to the adoption of NESHAP. Its properties, such as fire and chemical resistance, flexibility, high strength, and long and thin fibrous shape, made it a desirable component for the manufacturing of many construction materials, including insulation, roofing shingles, floor and ceiling tiles, paper products, brake pads, gaskets, and pipe. Originally, A-C pipe was manufactured using Portland cement, water, silica, or silica-containing materials and asbestos fibers. The A-C pipe was well suited for utility systems and was widely used for drinking water, wastewater, and stormwater pipelines from the 1940s through the 1960s. This time frame corresponded with a significant investment in utility infrastructure in the U.S. Figures 1 and 2 highlight the EPA "Clean Water and Drinking Water Gap Analysis," which was published in 2002 and illustrates key infrastructure growth periods associated with increased popularity of installing A-C pipe.

Under the Clean Air Act, EPA developed the NESHAP regulations. Asbestos, considered a hazardous air pollutant, became federally regulated in 1973 when NESHAP (40 CFR 61, Subpart M) was promulgated. The NESHAP addresses milling, manufacturing and fabricating operations, demolition and renovation activities, waste disposal issues, active and inactive waste disposal sites, and asbestos conversion processes. After adoption of NESHAP, asbestos fiber content in pipe was reduced from a maximum of 20 percent down to less than 0.2 percent (Von Aspern, 2009). Manufacturing and installation of A-C pipe in the U.S. ceased shortly thereafter.

Asbestos Pipe in North America

In 2002, EPA estimated the total amount of potable water distribution pipe in the U.S. to be 863,000 mi, with an annual rate of new installation at 11,900 mi (EPA, "Costs for Water Distribution System Rehabilitation," 2002). The EPA estimated the total amount of force main system as 60,000 mi in 2010, (EPA, "State of Technology of Force Main Rehabilitation," 2010). In 2002, an American Water Works Association survey of 337 large utilities serving nearly 60 million customers found that 15.2 percent of distribution systems were composed of A-C pipe. An informal survey

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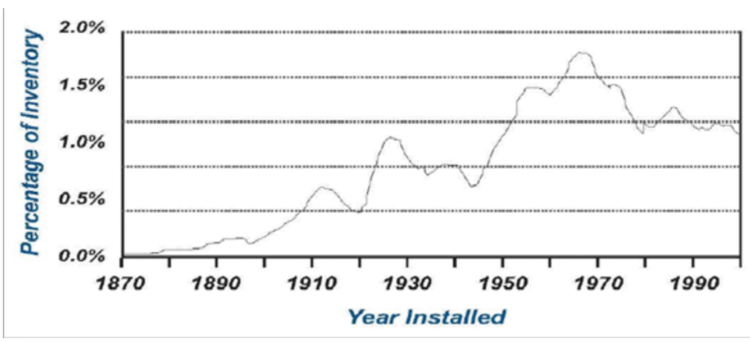

Figure 1. Age Distribution of Current Inventory of Pipe for 20 Cities Evaluated in EPA Gap Analysis.

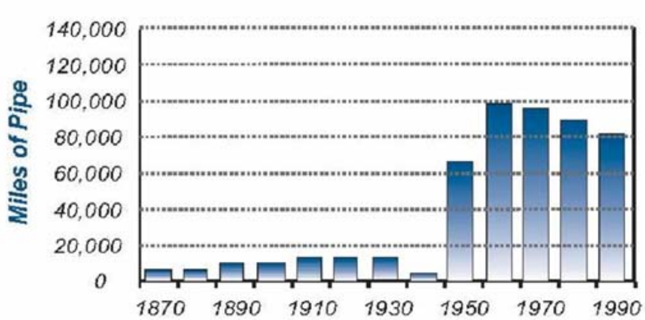

Figure 2. Miles of Sanitary Sewer Pipe installed per Decade as Shown in EPA Gap Analysis.

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using public information sources on the Internet revealed that much of the A-C pipe was installed in the Western U.S. (Table 1). Substantial portions have been in use for 40 to 60 years, the typical life expectancy of A-C pipe.

Many efforts have been made to quantify the amount of A-C pipe installed in the U.S., and the perceived amount varies. While it is difficult to accurately measure how much A-C pipe remains in the ground, and its condition, there is currently an estimated 630,000 mi of A-C pipe in the U.S. and Canada (Von Aspern, 2009). However, it is clear that much of this pipe is reaching the end of its service life and requires immediate maintenance, replacement, and/or rehabilitation.

For the current planning period of 2000 to 2019, the EPA gap report indicates severe deficits in operation and maintenance (O&M) and capital investments in both clean water and drinking water infrastructure. The annual O&M deficit for clean water totals up to $229 billion, while the capital deficit is up to $177 billion. The annual O&M deficit for drinking water totals up to $495 billion, while the capital deficit is projected to top $267 billion. The total 20-year deficit of clean water and drinking water O&M and capital costs could be as high as $1.168 trillion (EPA, "Clean Water and Drinking Water Gap Analysis," 2002). Rehabilitation of the estimated A-C pipe in the U.S. and Canada potentially could cost both countries upwards of $332 billion, assuming a moderately conservative price of $100 per lin ft. A signficant amount of the funding gap can be attributed to maintenance and replacement of A-C pipe. Life cycle cost analysis illustrates that maintenance costs rise as the A-C pipe ages, and there is an optimal replacement time, as shown in Figure 3 (Frangopol, 2001).

Much of the nation's asbestos-cement pipe is buried in the West, where rapid midcentury development helped the material gain popularity.

Type of System	Percentage of System
Sanitary sewer	10 - 25
Water distribution	40 - 75
Storm drainage	50 - 80

Table 1. Percentage of installed AC pipe per type of pipe system.

In 2010, EPA published a document on aging water infrastructure research, which reflected a focus to utilize science and innovation to breach the funding gap for clean water and drinking water. Industry members who are knowledgeable of pipe bursting understand that this newer technology could be a very effective tool for replacement of the infrastructure. However, pipe bursting has been severely limited by widely varying interpretations of NESHAP when utilized to replace A-C pipe across the U.S.

It appears that 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 (Brahler, 2011). Interpretation and application of NESHAP by regulators and the industry for replacing or rehabilitating these aging A-C pipelines are varied and have been controversial for more than two decades. Interpretations have ranged from requiring the removal and disposal of A-C pipelines and extensive recordkeeping, to allowing any replacement, abandonment, or rehabilitation technique, and no recordkeeping. The states of Nevada, Arizona, New Mexico, and Florida allow pipe bursting of A-C pipelines. Oregon requires all A-C pipes to be removed if exposed for any reason and requires specially licensed contractors for any work on A-C pipelines. California does not allow pipe bursting or any activity that will break the A-C pipeline.

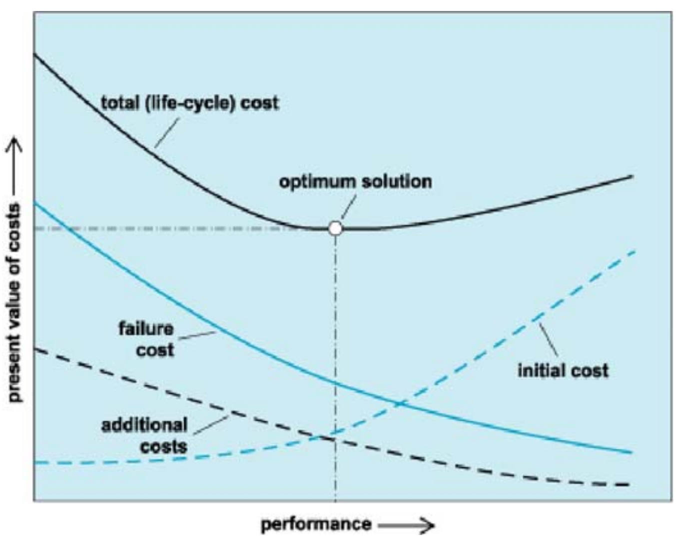

Figure 3. Life cycle cost graph.

Pipe Bursting

Pipe bursting is an industry-proven technology for trenchless replacement of existing underground conduit systems, such as water, sewer, and gas. The existing pipe is replaced with a new pipe of the same size or larger. This technology has become cost-effective in many applications and varying project settings, and is most cost-effective in urban areas or where the existing pipe is structurally deteriorated or additional capacity is needed (Simicevic, 2001).

Pipe bursting is typically performed using one of two methods: pneumatic or static pull. In either case, the existing pipe is fractured and displaced outward, while the new pipe is pulled into place along the existing pipe alignment. Fracturing the existing pipe is accomplished by pulling a conical-shaped head, also called a bursting head, through the existing pipe that has a slightly larger outside diameter than the inside diameter of the existing pipe. The new pipe is attached to the back of the bursting head so that it is simultaneously installed as the bursting head is pulled through the existing pipe (American Society of Civil Engineers, 2006).

While pipe bursting is trenchless, it does require some excavation work. Excavations typically include a pipe insertion pit, machine pit, and service connection pits. The pipe insertion pit is constructed to allow the new pipe to transition from above ground to below ground at the same elevation and alignment as the existing pipe to be pipe-burst. The machine pit is constructed for the pipe bursting machine to be placed and/or for retrieval of the bursting head. Service connection pits are constructed to reinstate service laterals to the main after pipe bursting the main is completed.

A pneumatic pipe bursting system uses a constant tension winch and a cable to pull on the nose of the bursting head, and an air-operated hammer inside the bursting head. The air-operated hammer provides forward force (much like driving a nail with a hammer) and the constant tension winch keeps the bursting head against the existing pipe and maintains the path of the bursting operation. Air is delivered to the air-operated hammer by way of an air line that is placed inside the new pipe, and also to an air compressor that is above ground near the pipe insertion pit. Figure 4 depicts a typical pneumatic pipe bursting operation (ASCE, 2006).

A static pull pipe bursting system uses a rod string to connect to the nose of the bursting head and a hydraulically operated machine (bursting machine) to pull the rod string,

Picture 1. Pipe bursting service connection pit with minimized impact to existing landscaping.

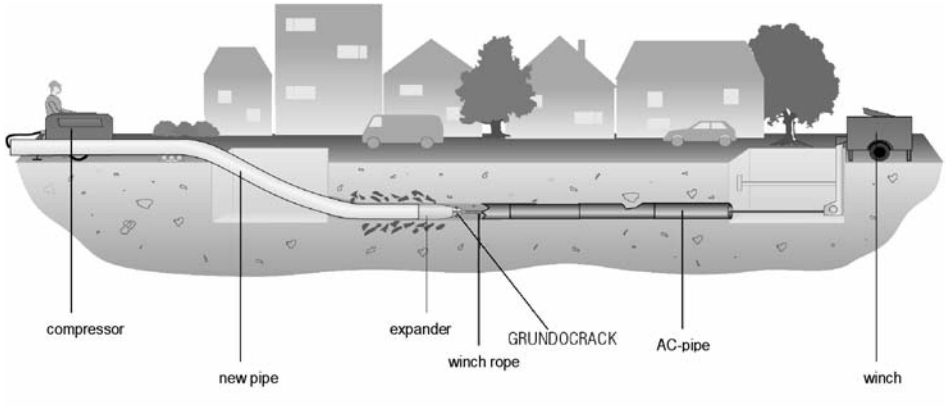

Figure 4. Typical pneumatic pipe bursting operation.

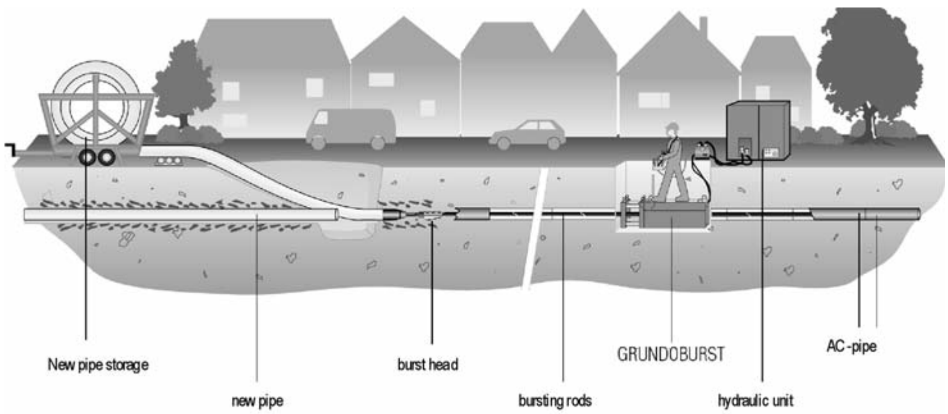

Figure 5. Typical static pull pipe bursting operation.

bursting head, and new pipe through the existing pipe alignment. Forward force is provided by the bursting machine. There is no air compressor or air line passing through the new pipe. Figure 5 depicts a typical static pull pipe bursting operation (ASCE, 2006).

Pipe bursting is typically accomplished on existing pipe systems that range in size from 2 in. to 36 in. in diameter. Although larger diameter pipe bursting has been completed, it is less common. Lengths that are most common for a pipe burst run are typically 200 to 400 ft; however, longer and shorter lengths can be performed without problems when properly planned. Actual lengths of bursts are determined when planning and estimating a pipe bursting project. Pits are strategically planned to be located at or near manholes in gravity systems and fittings, valves, or service connections for pressure systems.

Almost any underground pipe system can be a candidate for pipe bursting, including potable water, reclaimed water, sanitary sewer, stormwater, gas, or telecommunications. Existing pipe materials that are best suited for pipe bursting include vitrified clay, A-C, cast iron, and nonreinforced concrete. Other materials that can be burst, but are less common, include polyvinyl chloride (PVC), ductile iron, or high density polyethylene (HDPE). The more brittle a material is, the easier it can be pipe-burst. Pliable materials like PVC, HDPE, and ductile iron are cut or sliced rather than fractured. Pipes that are not recommended for pipe bursting include any corrugated material, such as corrugated metal and corrugated plastic. Corrugated pipes tend to collapse or telescope down on themselves due to not having the longitudinal strength to withstand the forces acting upon them during the pipe bursting operation (Simicevic, 2001).

Jobsite conditions most cost-effective for pipe bursting are urban settings that contain roadways, drainage systems, and other existing utilities that would prevent or inhibit conventional open-cut installation of a new pipe system. Pipe bursting requires substantially less excavation than conventional open-cut and does not require a new route for the proposed pipe system. Because pipe bursting minimizes the amount of excavation on a rehabilitation project versus traditional open-cut construction, impacts to developed neighborhoods and commercial areas with established landscaping are often minimized (Picture 1). This environmental benefit is often overlooked but is one of the benefits most recognized by the residents and customers.

When planning a pipe bursting project, bypassing of flow and service interruption must be considered because the existing pipe system must be taken out of service for the pipe bursting operation. In gravity systems, bypass pumping can be accomplished from manhole to manhole. In pressure systems, valves or other isolation methods (line stops or squeeze-offs) can be utilized to interrupt the flow long enough to isolate a segment of existing pipe for pipe bursting. With proper planning, the pipe bursting contractor can often reduce out-of-service time of the utility to a six-hour time frame, which can be accommodated during normal working hours from 8 a.m. to 5 p.m. This is particularly convenient for utilities where the majority of their customer base is working during this time period. However, bypass systems can be installed when pipe bursting in done in commercial or industrial areas.

A very attractive attribute of pipe bursting is that it requires minimal engineering design work to be done. Record drawings or geographical information system (GIS) database drawings are the best information for designing and planning a pipe bursting project because the existing pipe route is utilized for constructing the new system. If no record drawing or GIS drawing is available, pipe bursting is still a valid rehabilitation method.

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The project will have to be planned through other maps, such as aerials or field drawings. There are various methods of locating the new pipe, which can be the basis of new record drawings or GIS information. This is also a major benefit in urban areas that suffer from overutilized right-of-ways. Because the replacement pipe is inserted into the exact location of the existing utility, no additional right-of-way is necessary and there is no impact to other existing utilities, as could occur through new utility installations.

Other benefits of pipe bursting include health, air, economic, utility customer, and social (Rehan, 2007). Health and air benefits are derived from the minimal use of excavations and less equipment requirements in comparison to conventional open-cut (Ariaratnam, 2009). Pipe bursting generates significantly less dust, nitrous oxide emissions, and erosion and sediment runoff. Economic and utility customer benefits are derived from less cost for pipe bursting in comparison to open-cut construction. Social benefits are derived from quicker, less invasive construction than open-cut (Matthews, 2010).

The use of pipe bursting to replace aging A-C potable water distribution pipe was recently approved by the Drinking Water State Revolving Fund Program (DWSRF) as a qualified Green Project Reserve program at the City of Casselberry. The program was provided grant funding through the American Recovery and Reinvestment Act (ARRA) and has successfully rehabilitated A-C pipe using pipe bursting while meeting all NESHAP criteria. Industry representatives worked very closely with the Florida Department of Environmental Protection (FDEP) and EPA representatives to determine how NESHAP applies to pipe bursting of A-C pipe and how to comply with these requirements. Much of the difficulty with applying NESHAP requirements to pipe bursting was its focus on above ground construction; pipe bursting is a new technology that was not available for consideration at the time NESHAP was written.

NESHAP Defined

The NESHAP provides for the distinction of asbestos-containing material (ACM), using terms such as friable, nonfriable, Category I, Category II, and regulated asbestos-containing material (RACM). Friable ACM is defined as any material containing more than 1 percent asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy, (PLM), that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure (Picture 2). In contrast, nonfriable ACM is any material containing more than 1 percent asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, PLM, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

The EPA defines two categories of nonfriable ACM: Category I and Category II nonfriable ACM. Category I nonfriable ACM is any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product that contains more than 1 percent asbestos as determined using PLM, according to the method specified in Appendix A, Subpart F, 40 CFR Part 763 (Sec. 61.141). Category II nonfriable ACM is any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using PLM, according to the methods specified in Appendix A, Subpart F, 40 CFR Part 763 that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure (Sec. 61.141) as shown in Picture 3.

The EPA defines RACM to be: (A) friable asbestos material; (B) Category I nonfriable ACM that has become friable; (C) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting or abrading; or (D) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

According to an EPA 2011 guidance document prepared by Alliance Technologies Inc., if Category II nonfriable ACM has not crumbled, been pulverized, or reduced to powder and will not become so during the course of demolition/renovation operations, it is considered nonfriable and therefore is not subject to NESHAP. However, if during the demolition or renovation activity it becomes crumbled, pulverized, or reduced to powder, it becomes RACM and is subject to NESHAP. This guidance document was prepared based on discussions with a work group from EPA, which consisted of the following regional asbestos NESHAP coordinators: Ron Shafer, Scott Throwe, and Omayra Salgado of the Stationary Source Compliance Division; Charles Garlow and Elise Hoerath of the Air Enforcement Division; and Sims Roy of the Standards Development Branch (Alliance Technologies, 2011). The A-C pipe is a Category II nonfriable ACM, according to EPA's guidance document, and is potentially subject to NESHAP requirements, depending upon what type of activity is planned for the A-C pipe and how much (length) of A-C pipe will be affected.

The NESHAP provides exemptions from its regulations based on the quantity of ACM. For A-C pipe, the quantity threshold is 260 lineal ft, regardless of diameter, in one calendar year. Other exemptions from NESHAP or clar-

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Picture 2. Friable asbestos insulation.

Picture 3. Fractured AC pipe resulting from pipe bursting as it will remain in the ground.

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ifications of its requirements for A-C pipe have been provided by interpretive letters in response to questions posed to EPA (EPA, 1990). Examples of issues clarified or interpreted through such letters include the following:

1. Buried A-C pipe is potentially subject to NESHAP because it is considered a "facility" or "facility component."
2. Buried A-C pipe removed from the ground intact and disposed in a waste disposal site is exempt from NESHAP.
3. Buried A-C pipe that is capped and abandoned in-place is exempt from NESHAP.
4. Buried A-C pipe that is grout-filled and abandoned in-place is exempt from NESHAP.
5. Crushing buried A-C pipe with mechanical equipment causes the AC pipe to be subject to NESHAP requirements.
6. Pipe bursting buried A-C pipe causes A-C pipe to be subject to NESHAP requirements.
7. Pipe reaming buried A-C pipe causes A-C pipe to be subject to NESHAP requirements.
8. Sliplining buried A-C pipe is exempt from NESHAP requirements.
9. Work on buried A-C pipe that is subject to NESHAP requirements is considered renovation work, not demolition work.

These exemptions and clarifications are representative of EPA's opinion of the applicability of NESHAP to various types of work on buried A-C pipelines.

Minimized Future Exposure

Industry representatives maintain that the A-C pipe fragments that remain after a pipe bursting project are not RACM. It is highly unlikely that these A-C fragments would become friable over time. If future excavations uncover the A-C fragments, they are typically caked in moist soil and the fibers are not likely to go airborne. The rehabilitated pipe alignments are typically under streets and/or in public right-of-ways and are not typically disturbed except by authorized personnel working in the vicinity (Phillips, 2009).

There has been much debate as to the pipe bursting process turning the existing nonfriable Type I AC pipe into friable Type II RACM. All of the rehabilitation activities, except the portions of pipe that are exposed at pits, occur underground. The segments of fragmented A-C pipe remain within a few inches of the soil material surrounding the new pipe. Future exposure of the general public to the burst A-C pipe for lengths greater than the 260 lin ft already stated in NESHAP will be solely limited to rehabilitation work along new pipeline. Homeowners that wish to install new landscaping or work above the new pipeline will have minimal exposure to the burst A-C pipe because they are not likely to physically expose over 260 lin ft of the pipe. Homeowners will also not likely be digging as deep as the typical 3 ft of cover over the pipe-burst A-C pipe. Other utilities that will perform work in this area will likely expose limited areas associated with only crossing the new pipe and will not expose over 260 lin ft of the pipe.

The only agency that will have to deal with potential future exposure over the 260-lin-ft threshold will be the one that performed the pipe bursting rehabilitation. This agency should have ample records indicating the location of these A-C fragments. The agency should also clearly understand the mitigation required if this material is removed in the future before starting any A-C pipe bursting project.

Current NESHAP Compliance Procedures

While debate continues as to the applicability of NESHAP to pipe bursting buried A-C pipelines, a working procedure has been developed in Florida that regulators and industry members (municipalities, engineers, and contractors) are utilizing. This procedure complies with each element of NESHAP, 40 CFR part 61, subpart M (61.140-61.157), and is briefly described.

File a Notice to EPA or Its Designee, 61.145(b)

The NESHAP specifies salient information that must be included on the notice; the FDEP has available form 62-257.900(1) that requires this information. The one-page form has to be signed only by the utility owner.

Provide for Emission Control during Renovation and Disposal, 61.145(c)/61.150

There can be no visible emissions from the work (pipe bursting) per 61.150(a). With pipe bursting, this can be easily accomplished because the A-C pipe is wetted within any excavation; cutting is accomplished using nonpower saw tools (chain cutter, handsaw). Segments of A-C pipe that are removed from an excavation are wrapped in plastic, sealed leak-tight, taped, and placed into a dumpster for shipment by an asbestos transporter.

A negative exposure assessment (NEA) was performed for the City of Casselberry project and approved by the DWSRF program for ARRA grant funding. American Compliance Technologies determined the observed time-weighted averages for the sampled employees that performed representative work activities for pipe bursting operations along Benedict Way in Casselberry from March 21-23, 2011, were below the Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) of 0.1 f/cc (ACT, 2011). Numerous contractors and municipalities have conducted NEAs on A-C pipe bursting projects. To date, none of these assessments have shown any asbestos fiber release within a work site. The pipe bursting process minimizes risk of exposure to workers that are rehabilitating the pipe because the majority of the rehabilitation occurs underground.

Comply with Inactive/Active Waste Disposal Site Requirements, 61.151/61.154

The NESHAP provides for disposing of RACM on the site of the demolition or renovation work, or the RACM can be disposed of at a waste disposal site. Currently, for pipe bursting projects, regulators interpret NESHAP such that the work site is considered a waste disposal site. Numerous options are provided in NESHAP to prevent asbestos exposure. These options include: no visible emissions from the site; fencing and posting signs around the site; have a natural barrier (cliffs, lakes or other large bodies of water, deep and wide ravines, and mountains) around the site; or cover the RACM with 2 ft of compacted nonasbestos-containing material. With pipe bursting, the 2 ft of cover is virtually always provided because the pipe bursting is performed on a buried A-C pipeline. Also, no emissions from the work have been detected on pipe bursting projects.

Comply with Inactive Waste Disposal Site Deed Notation and Alternative, 61.151(e)

The NESHAP requires that a notation to the deed of a facility property be recorded within 60 days of a waste disposal site becoming inactive. A site is deemed inactive when disposal of RACM is completed. Applying this to pipe bursting projects, a site is deemed inactive when the project is completed. The notation is to contain the following information:

1. The land has been used for the disposal of asbestos-containing waste material.
2. The survey plot and record of the location and quantity of asbestos-containing waste disposed of within the disposal site required in Sec. 61.154(f) have been filed with the administrator.
3. The site is subject to 40 CFR part 61, subpart M.

Conflict between Deed Notation Requirement and Public Right-Of-Way

It appears possible that the drafters of NESHAP made the presumption that the facility property will have a single deed associated with the site, that the property would be deeded, and that the property is transferable. In contrast, a public land right-of-way does not have a deed, can transect public and private properties, and the municipality or county is not the fee title owner of the right-of-way and cannot record notices directly on a fee title of right-of-way. Utility providers have installed a significant amount of A-C pipe within the public right-of-way to provide utility services to the public. The deed notation and general compliance requirements have been a significant deterrent to many utility providers that would have been rehabilitating A-C pipe.

This is the only requirement of NESHAP that is not explicitly met as it is written. Given the previously described presumptions of the drafters, and realizing that pipelines typically run in public right-of-ways, this issue had to be discussed with EPA regulators to develop a solution. Industry representatives have suggested a potential solution to the deed notation requirement for the locations of A-C pipe that have been pipe-burst.

Administrator-Approved Alternate

The meeting with industry representatives (including members of Killebrew Inc.) and EPA staff took place in November 2010 to discuss the applicability of NESHAP to pipe bursting A-C pipelines and to develop a reasonable, practical solution to the deed notation issue. The EPA staff acknowledged potential difficulty in applying NESHAP deed notation requirements to A-C pipe bursting within public right-of-ways. However, when presented with a video of several physical demonstrations of pipe bursting that clearly displayed the *minimal* environmental impacts of pipe bursting over traditional open-cut replacement methods, EPA staff expressed a positive attitude towards pipe bursting. The meeting concluded with EPA suggesting that the industry develop an "administrator-approved alternate" for all to follow.

The alternate is intended to allow the EPA administrator and staff to approve alternate technology or practices without having to modify NESHAP, which is federally codified. Industry members who have been following the pipe bursting of A-C pipe issue are pleased

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with the opportunity to pursue an alternate and are working toward this objective. However, at this time, there are not any guidance documents or previous examples of an EPA administrator-approved alternate to reference, and according to EPA, the alternate has not been developed for any technology or practice to date. An A-C pipe bursting task force has been assembled to develop this document.

The alternate is intended to provide procedures for working with buried A-C pipelines. The exemptions and clarifications listed early will be included so that one, comprehensive document, *specific to buried A-C pipelines*, will be available for use nationwide, and that any type of work on buried A-C pipelines will be uniformly practiced and regulated, regardless of the state in which the work may be located.

Collaborative efforts among industry members have been ongoing since November 2010 to draft the administrator-approved alternate. Once the first draft is prepared, it will be submitted to EPA's Washington, D.C., office for review and consideration. In the meantime, to satisfy the deed notation requirement, a notice is being sent to public records that contains all required information for ongoing projects in Florida.

The EPA Office of Research and Development (ORD) has set a goal to generate the science and engineering needed to improve and evaluate promising innovative technologies and techniques that will reduce the cost and improve the effectiveness of operation, maintenance, and replacement of aging and failing drinking water and wastewater treatment and conveyance systems. Existing technologies need to be applied in unconventional ways. Emerging technologies and innovative thinking will be at the forefront of creating a powerful, secure, cost-effective, and reliable water infrastructure (EPA, "Addressing the Challenge through Science and Innovation," 2010). The industry believes application of pipe bursting for A-C pipe is a prime example of an emerging technology that should be approved and utilized to mitigate the accelerating costs of A-C pipe replacement.

Florida Department of Environmental Protection Supports Pipe Bursting A-C Pipelines

The FDEP has provided support of the pipe bursting process and believes it is environmentally and economically superior to removing existing A-C pipe, and that pipe bursting is more economically feasible than the traditional method of removing and landfilling old A-C pipes. On April 27, 2011, Herschel T. Vinyard Jr., secretary of the FDEP, sent a letter to the EPA Region 4 office in Atlanta requesting assistance to finalize EPA's position and interpretation of pipe bursting A-C pipelines.

Conclusions

Over 630,000 mi of buried A-C pipelines remains in use across the U.S. and Canada. All of this underground piping has reached, or is quickly approaching, the end of its useful life. Replacement or rehabilitation is imminent. Pipe bursting is a proven technology that is environmentally, socially, and economically beneficial and is approved by numerous states, including Florida. Utility providers need to be able to utilize a wide array of technologies, including pipe bursting, to be able to recapitalize their assets.

Application of pipe bursting for rehabilitation of existing A-C pipe meets the goals set forth by EPA's ORD to reduce the cost of rehabilitation and replacement of existing infrastructure through new and innovative technology. Unfortunately, application of this new and innovative technology is severely limited through rules and regulations that are almost 30 years old. It is clear that these rules and regulations require updating to properly account for technology that has developed since the promulgation of the rule. Controversy still exists regarding the applicability and interpretation of NESHAP for buried underground A-C pipelines. Efforts to develop the administrator-approved alternate will rectify these matters and develop uniform procedures for use nationwide by industry and regulators. Every effort needs to be made, from industry representatives, utility operators, and EPA regulators, to close the clean water and drinking water infrastructure funding gap.

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