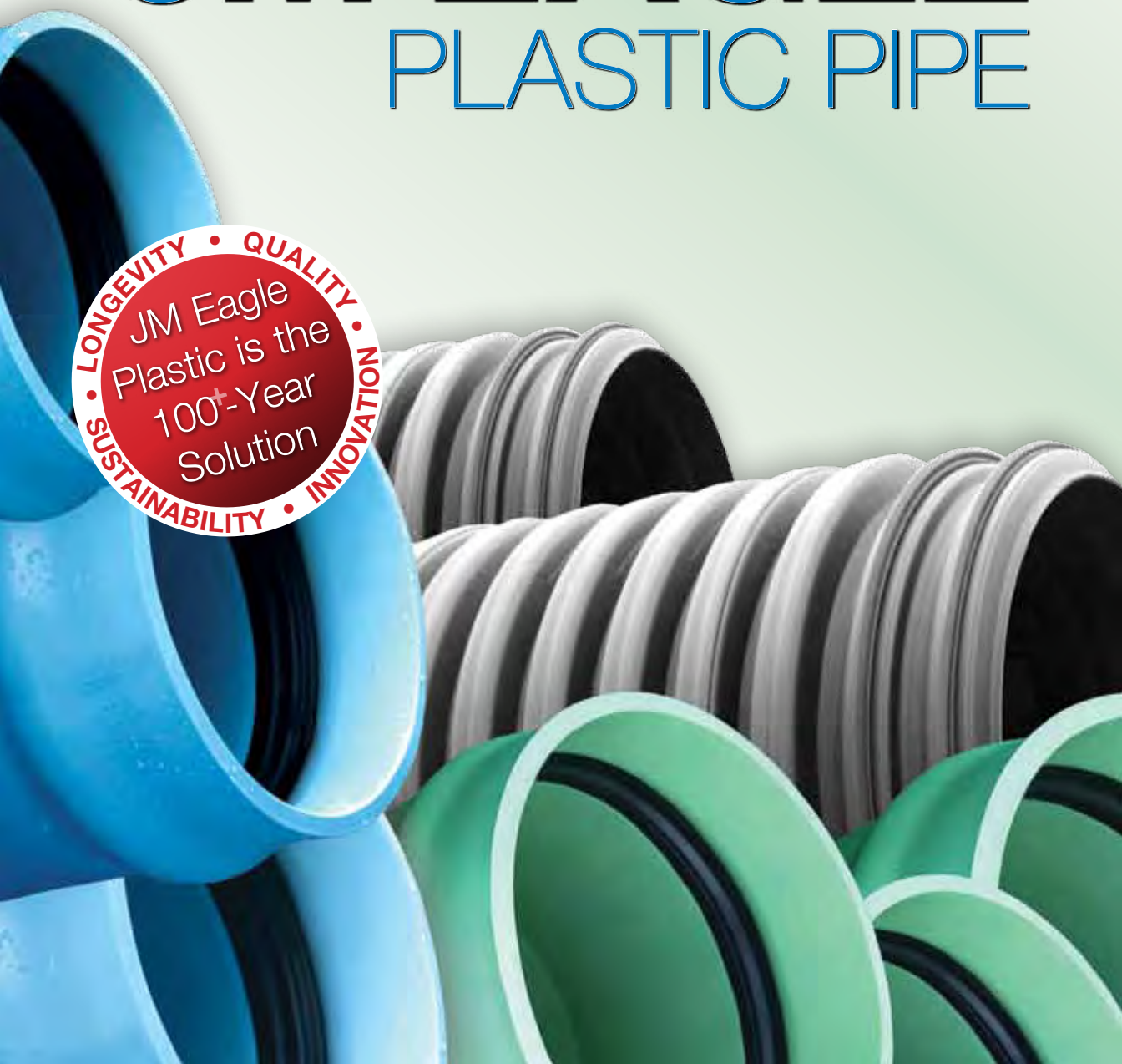
5 STRENGTHS OF JM EAGLE PLASTIC PIPE



The Longest Lasting

A 100-plus-year life span of JM Eagle plastic pipe means less breakage, fewer replacements.

Specifying, purchasing and installing pipe is something no municipality wants to go through in the same location more than once a century, much less once a decade. Pipe going in the ground is supposed to provide clean water and safe drainage for at least a couple of generations.

But it's not. Water mains and storm drains are breaking across the country, costing billions of dollars each year in repairs alone and wasting a significant quantity of drinking water, as well as often flooding and contaminating the environment. The cause: inferior pipe materials that corrode, break or build up sediment.

Case in point is the city of Los Angeles. Following an exceptionally high number of breaks during the summer of 2009, the LA Department of Water and Power determined corroded cast-iron pipe was overwhelmingly to blame, and that they "tend to cause greater street damage than do breaks on other types of pipes."

Its report went on to read, "Physical examination of the pipe samples showed rust, corrosion pits, micro fractures and graphitization."

The LADWP estimates the city's water infrastructure to endure 70 to 100 years. This year, about 7.5 million feet of the infrastructure will fall into the expiration range. Officials estimate it will take 180 years to replace all the pipe in the city of Los Angeles.

Better choices

Cities like Los Angeles can lengthen the replacement cycle, as well as decrease corrosion and breakage along the way, by choosing JM Eagle plastic pipe products over other materials.

Research completed in 2009 by the Plastics Pipe Institute along with Jana Laboratories found that PE can last more than 100 years. And a 2007 study commissioned by the AwwaRF and conducted by Australia's Commonwealth Scientific and Industrial Research Organization found the same for PVC. It predicted that PVC pipe offers a minimum service life of 100 years for water utilities.

That AwwaRF study, titled "Long Term Performance of PVC Pipes," found no significant degradation or deterioration occurring to the pipe, and projected very good performance through 110 years.

Fewest breaks

How do the other products stack up? The National Research Council of Canada reports that the break rate for plastic water-distribution pipe is 0.7 breaks per 62 miles (100 km) each year, the rate for ductile iron is 9.5 breaks, and the rate for cast iron is 35.9 breaks.

It is estimated that 15 percent of treated water, or 2.2 trillion gallons, is lost to line breaks and leaks annually. And the federal government projects a $36 billion loss to the U.S. economy each year from corrosion in water and sewer pipes.

> **PVC pipe offers a minimum service life of 100 years for water utilities.**

So it is clear, when examining the longevity rates for plastic vs. other materials, plastic is the material that reduces the risk of flooding and contamination and saves cities time and resources. ■

JM EAGLE PRODUCTS AT WORK

District proves that plastic beats iron

In 1975, Water District #1 of Johnson County thought plastic pipe might be the product of the future. So as a time capsule of sorts, employees of the suburban Kansas City, Kan., area buried a piece of Johns Manville (now JM Eagle) PVC pipe in the ground to see how it would hold up.

In 2008, the district dug up the pipe to see what kind of damage more than three decades of soaking in highly acidic soil had done.

"We cut it out and took it up to a certified lab to test," says Brian Schade, Water One's lead design engineer, "and after 33 years, it showed virtually no sign of age."

It's not the only time Water One, which encompasses 270 square miles and 16 cities, has put pipe to the test. JM Eagle Ultra Blue AWWA C909 pipe met intense scrutiny when the district was introduced to it a few years ago.

"We basically let (the Construction team) try to destroy the pipe," says Schade, describing the pressure testing, burst testing, tapping and rough handling to which the team subjected it. "They tested it out and put it through its paces."

"We filled it to 300 psi and had it lying on the ground and took a backhoe to it," explains Ernie Hamilton, assistant manager of construction. "We had to hit the pipe with the tooth on the bucket to break it."

McCorkendale Construction works with Water One. Superintendent Rick Lickteig is happy with the choice of plastic.

"We're basically using all PVC now, no ductile iron," says Lickteig. "It's simpler to lay PVC than ductile iron and you don't have to polywrap it. And I've noticed a significant drop in leaks in the pressure testing."

Schade agrees that plastic is the right product.

"What we're looking at is mitigating corrosion, and our soils are generally considered hot," says Schade, who keeps a piece of the 1975 sample at his desk. "We needed to pick a product that doesn't corrode and will provide a long-lasting infrastructure."

The Highest Quality

2

Continual testing at every stage of JM Eagle production delivers peace of mind.

"Plastic pipe is inferior to other products." "Plastic doesn't meet the construction codes of our district." "It's too risky to specify plastic pipe."

These are just a few of the misconceptions about plastic pipe when it comes to quality and meeting industry standards. In fact, these statements couldn't be further from the truth.

Every piece of JM Eagle plastic pipe meets or exceeds one or more standards, including ASTM, AWWA, UL, FM, NEMA, CSA, NRCS and AASHTO.

To achieve the stamp of approval from these groups, each product has gone through rigorous physical testing, including acetone immersion, pipe stiffness, flattening, impact resistance, quick burst and hydrostatic proof, as well as a sustained pressure test for a minimum of 1,000 hours.

Standards for plastic pipe are equivalent to those for other products, including ductile iron, and call for the same quality controls. As long as these standards are written into municipal codes, as they usually are via the Uniform Building Code, they are considered acceptable for use.

Code Check: JM Eagle Products Rise to the Standards

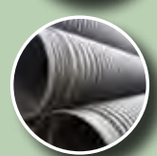
Blue Brute™ (C900)
Meets AWWA C900 and ASTM D1784 cell class 12454; Gaskets meet ASTM F477; Joints meet ASTM D3139.

Big Blue™ (C905)
Meets AWWA C905 and ASTM D1784 cell class 12454; Gaskets meet ASTM F477; Joints meet ASTM D3139.

Ultra Blue™ PVCO
Meets AWWA C909 or ASTM F1483, and UL 1285; Gaskets meet ASTM F477; Joints meet ASTM D3139.

Gravity Sewer
Meets ASTM D3034 (SDR 35 and 26) and ASTM F679 (PS46 and PS115) and ASTM D1784 cell class 12454 or 12364; Gaskets meet ASTM F477; Joints meet ASTM D3212.

Ultra Corr™/Ultra Rib™
Meets AASHTO M304, ASTM F794 and F949; Gaskets meet ASTM F477; Joints meet ASTM D3212.



Eagle Corr PE
Meets AASHTO M252 and ASTM 2648 (4" – 10"), AASHTO M294 and ASTM F2306 and F2648 (12" – 60"), and ASTM F477.

Always tested

Once accepted as meeting those standards and others, JM Eagle pipe is continually evaluated by third-party testers—including UL, NSF, FM, IAPMO, CSA and NETPEP—to ensure the quality of the pipe and that it's still making the grade.

> **Inspectors are always welcome to verify that every stick of JM Eagle pipe is of the highest quality.**

"A third-party auditor shows up every week unannounced to check the pipe," says Chuck Clark, plant manager at JM Eagle's Stockton, Calif., factory. "He goes everywhere, taking product from the line and from the yard, taking measurements and checking the pipe against all required specs and dimensions. It's a lot of physical testing, such as impact and stiffness, so when he comes, he's here all day long."

Close examination

The auditor also examines test records, pipe measurement records and calibration on the equipment, as well as checks the mixer to verify a formulation complies with the standard. To complete the process, the auditor will also pull a sample from the line, give it a special stamp to prevent fraudulent switching and ship it back to the testing lab for further verification.

Mai Huynh, JM Eagle's manager of quality assurance, says inspectors are always welcome to verify that every stick of pipe is of the highest quality.

"We say what we do and we do what we say," Huynh says. "Whether the inspector is here or not, we'll do the same thing."

Even with production quality of plastic pipe assured, the determining factor in selecting plastic over other products most often boils down to specifier preference: What is the "safest" choice? What will best serve the district?

With JM Eagle's plastic meeting or exceeding all standards, as well as its proven durability and significantly longer life than other products, it's hard to imagine a district putting anything but JM Eagle plastic pipe in the ground. ■

The Most Sustainable 3

Green, safe and reliable, JM Eagle's products come to the rescue where other pipe materials have failed.

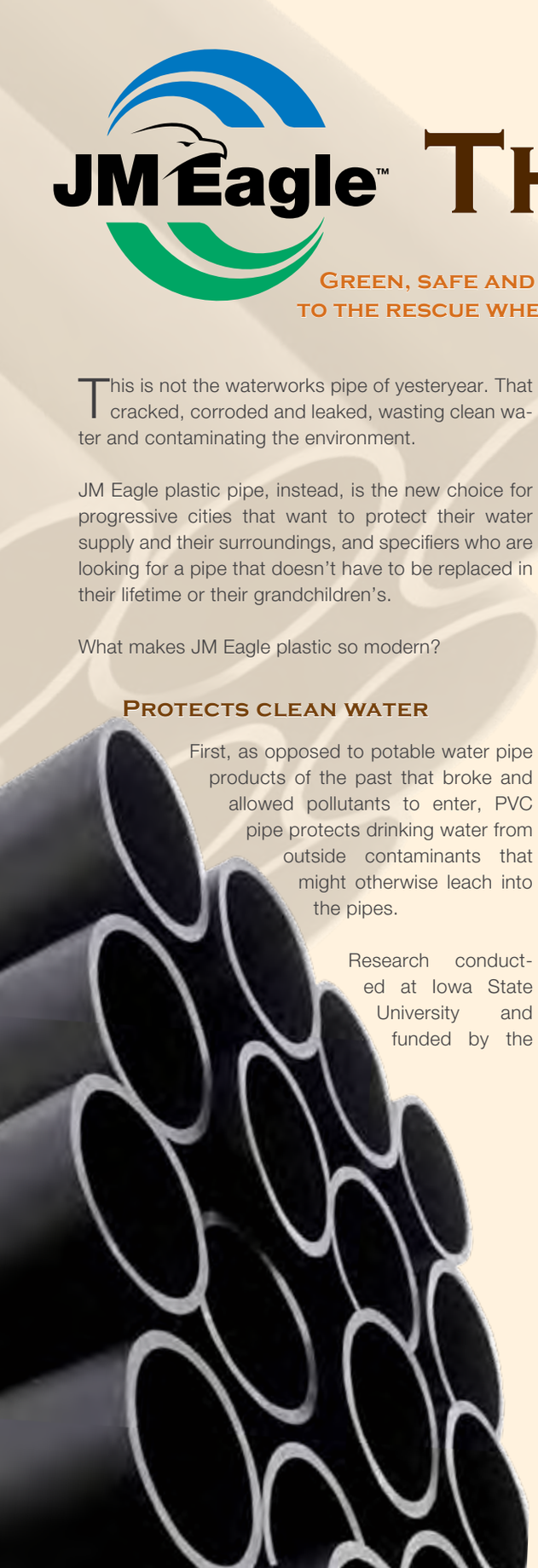
This is not the waterworks pipe of yesteryear. That cracked, corroded and leaked, wasting clean water and contaminating the environment.

JM Eagle plastic pipe, instead, is the new choice for progressive cities that want to protect their water supply and their surroundings, and specifiers who are looking for a pipe that doesn't have to be replaced in their lifetime or their grandchildren's.

What makes JM Eagle plastic so modern?

Protects clean water

First, as opposed to potable water pipe products of the past that broke and allowed pollutants to enter, PVC pipe protects drinking water from outside contaminants that might otherwise leach into the pipes.



Research conducted at Iowa State University and funded by the Water Research Foundation (formerly AwwaRF) demonstrates that PVC is impervious to gasoline, BTEX (benzene, toluene, ethyl benzene and xylene), and TCE (trichloroethylene) in ground-water at the most commonly encountered contamination levels.

> **JM Eagle plastic pipe is friendly to the environment, from the production process to the final installation.**

JM Eagle PVC pipes do not react or corrode with water. NSF International has certified all PVC drinking-water pipes under its Standard 61, ensuring that drinking-water quality standards are preserved according to those set by the U.S. Environmental Protection Agency.

Green manufacturing and use

Second, JM Eagle plastic pipe is friendly to the environment, from the production process to the final installation. It requires lower amounts of water and lower temperatures to manufacture than ductile iron. It is completely recyclable. JM Eagle plastic-pipe plants meet stringent, audited air-quality standards. No chlorinated solvents are used in manufacturing. It uses less fuel to transport than iron and concrete pipe. And it requires less fuel-consuming heavy equipment during installation.

Protects the environment

Third, JM Eagle plastic pipe not only protects and conserves the water inside the pipe, it protects the surroundings outside the pipe because it rarely cracks or breaks, even under harsh conditions. Intensive testing of PVC at Utah State University over 22 years demonstrated that under a constant strain condition PVC pipe will not fail.

In fact, JM Eagle plastic pipe has rescued cities across the country from water disasters with outright replacement or, when digging is too disruptive to the environment, slip-lining. Slip-lining pushes new PE through the broken and corroded pipe to create a new fresh, clean and reliable waterway. New technology in horizontal directional drilling using internally restrained PVC pipe also provides easy installation without disturbing surroundings, whether urban or rural.

As the sustainable building movement continues to gather steam, JM Eagle's plastic pipe is well-positioned for "green" water infrastructure projects. Its lower energy profile, minimal need for maintenance, water-conserving properties and recyclability make it an ideal material for municipalities looking to boost their environmental friendliness quotient. ■

JM EAGLE PRODUCTS AT WORK

Plastic saves Port of Tampa from aggressive iron eater

Corrosive, aggressive soil had eaten through a 35-year-old ductile iron pipeline, causing in a 200-foot section at least 13 unstoppable leaks that could not be repaired. To replace the rotten pipe with more iron would be costly and shortsighted. The rescue came with JM Eagle plastic pipe.

The Tampa Water Department approved the purchase of 960 feet of 12-inch DR18 Eagle Loc 900, which was used in a project that ran from November 2009 to January 2010.

It was the first time installation contractor Dallas 1 Construction & Development had encountered Eagle Loc 900, JM Eagle's C900 pipe with internal joint restraint.

The additional timesaving aspect of the internal restraint joint was particularly helpful because the combination of toxic soil and rotted ductile could have slowed the process considerably.

The Dallas 1 Construction crew was able to lay more pipe per day than would have been expected with ductile iron or other products that are heavier or require old-fashioned external restraints.

"One particular day we laid 640 feet of pipe," Mitchell says. "If I'd have used external restraint joints, we probably would have gotten only 450 to 500 feet installed because it takes about 30 minutes per restraint."

Previous to the port project, the largest PVC installed by the Tampa Water Department was an 8-inch diameter pipe. Why so slow to adapt to other PVC products?

"It's not that Tampa officials don't like PVC," Mitchell says. "But like many municipalities, the city is picky about trying new products. The corrosive soil gave them no choice. Every iron pipe we've dug up has been totally eaten up."

The Leader in Innovation

Diligent engineering at JM Eagle delivers products for better performance and easier installation.

ADVANCED HOLDING TECHNOLOGY

- Teams JM Eagle C900 pipe with new internal restraint technology for the simplest-to-install yet strongest-holding product available.
- Designed for sanitary sewer force mains and potable water distribution and transmission.
- Grips the joint from the inside of the pipe with a simple push.
- Prevents the corrosion associated with external restraints.
- Reduces installation and labor as much as 30 times over traditional methods.
- Can be used for open-trench, road bore and horizontal directional drilling installations.

Meets AWWA C900 and ASTM D1784 cell class 12454; Gaskets meet ASTM F477; Joints meet ASTM D3139.

THE HDD ADVANTAGE FROM JM EAGLE

A West Point, Iowa, sanitary force main job called for 2,800 feet of 4-inch Eagle Loc 900, as well as tolerance for imperfect conditions. Heavy rains made for wet and muddy soils.

"Even in the adverse weather conditions we had to deal with," says Brian Lang, JM Eagle area sales manager, "the pipe installation went incredibly fast."

The Eagle Loc 900 was a material substitution, replacing one with a more complicated internal joint restraint. The contractor buried the pipe 5 feet deep in 400-foot sections using an 8-inch reamer attached directly to the pulling head and pipe.

"The contractor thought it was easier than fighting the couplings and splines of the pipe originally specified," says Lang. "He said the pipe was easy to pull and he looks forward to using Eagle Loc 900 again."

MOLECULAR ORIENTATION FOR LIGHT WEIGHT AND STRENGTH

- The highest-performing, lightest-weight, most cost-effective pressure pipe for potable water and force main systems.
- Molecularly oriented to be lighter yet stronger—as much as four times stronger than conventional PVC.
- Delivers HDB of 7,100 psi vs. HDB of 4,000 psi of conventional PVC pipe.
- Has a higher cyclic fatigue strength, greater impact strength and a larger interior diameter than conventional PVC.

Meets AWWA C909 or ASTM F1483, and UL 1285; Gaskets meet ASTM F477; Joints meet ASTM D3139.

JM EAGLE EXCLUSIVE TECHNOLOGY PAYS FOR ITSELF

Northern Ohio Rural Water boasts the best-tasting water in the state. What makes it so clean? JM Eagle's Ultra Blue AWWA C909 molecularly oriented plastic pipe.

Although engineered to be lighter, its toughness is unbeatable, resulting in a dramatic drop in leaks and breaks. Contractors for the district enjoy ease in transporting and handling, and the district is enjoying labor savings in installation and fewer repairs.

NORW Distribution Superintendent Bryan Puder says the 2005 move to Ultra Blue has protected the water supply and benefitted residents.

"I can truly say we have not had a single problem with it," says Puder. "That's so critical because historically if there's a leaking pipe you have to dig it up, which means shutting off service to customers."

NEW TECHNOLOGY FOR A HIGHER-PERFORMING JOINT

- Engineered by JM Eagle for superior hold at the joint.
- Available in 4-inch to 60-inch diameters.
- Features a heavy-duty integral bell and dual-gasket spigot, a dual-crown corrugated exterior for greater pipe stiffness, and a hydraulically smooth interior for maximum efficiency.
- Offers a superior strength-to-weight ratio and flexible conduit design.
- Comes available with a full line of standard and custom fittings in either a soil-tight or watertight (10.8 psi) connection, as well as single-wall design.

Meets AASHTO M252 and ASTM 2648 (4"–10"), AASHTO M294 and ASTM F2306 and F2648 (12"–60"), and ASTM F477.

UNIQUE BELL AND SPIGOT FROM JM EAGLE

Eagle Corr PE (Dual Wall) proved the product of choice at a recent 2,000-home new-development project in Mexicali, Baja California, Mexico.

Like its closest competitor, Eagle Corr PE met the ASTM and AASHTO standards, but when the local water commissioner saw the integral bell and dual-gasket spigot and understood the complexity of the project, he was sold on the product.

Installed were 6,160 feet of 60-, 48-, 36- and 18-inch Eagle Corr PE pipe.

"The high-water-level conditions called for a pipe that provides a secure, watertight joint and absolute durability," says DOT Sales Manager John Orkish. "Eagle Corr PE was the right drainage product here, and will be used more in this area from now on."

The Complete 5 Manufacturer

Investments in technology, engineering and service make JM Eagle the wisest choice in pipe products.

JM Eagle is the construction industry's only complete plastic-pipe manufacturer and the world's largest. With 300-plus extruders at its 22 plants across the country and a 2.2-billion-pound capacity, its resources provide an unmatched capability for new products, new materials, new applications and new processes.

> **JM Eagle consistently produces the highest quality pipe in the industry and is committed to ensuring ongoing product excellence.**

Significant investments in research and development have allowed JM Eagle to combine advanced product technology with state-of-the-art automation. JM Eagle consistently produces the highest quality pipe in the industry and is committed to ensuring ongoing product excellence.

JM Eagle manufactures pipe for:

- Municipal water systems
- Sanitary sewage systems
- Rural water systems
- Plumbing
- Irrigation
- Agricultural
- Oil & gas distribution
- Electrical
- Communications
- Drainage systems

While much of the rest of the country scaled back during our recent economically challenging times, JM Eagle remained committed to maintaining this high level of excellence and superiority in product breadth, geographic reach and production capacity. In fact, in recent months, it has invested even more in increasing efficiencies and providing better customer service.

This service includes its ability to deliver PVC and PE products on the same truck and fill urgent orders with its fleet of Express Service Trucks that expedite product from plants across the country.

Plastic pipe from JM Eagle is durable, long-lasting and resistant to corrosion, which means leaks and breaks are exceedingly rare. It costs less to transport because it is light. And the technology behind it means it can be used in innovative ways including horizontal directional drilling and pipe bursting, which not only reduce costs, too, but also minimize disruption to daily life.

Pipe products don't come any stronger than plastic, and plastic pipe doesn't come any better engineered or more innovative than JM Eagle. Plastic pipe from JM Eagle can help rebuild our infrastructure that generations can rely on for years to come. ■

Rebuild responsibly with plastic pipe from JM Eagle

Water system leaks and breaks here and there due to cracks and corrosion are often tolerated as part of life. But when we see the cumulative damage they wreak on our property, health and safety, as well as our dwindling clean-water supply, we get a better understanding of the widespread crisis we are experiencing with our infrastructure.

We are fortunate to have at our disposal the best materials, the most talented engineers and the strictest standards. Through the decades and centuries—and many construction booms—we have always tried to use what we understood to be the best methods and products available for the time. But today there are new technologies and better choices. In the field of water infrastructure, that choice is plastic. JM Eagle plastic pipe stands the test of time like nothing else.

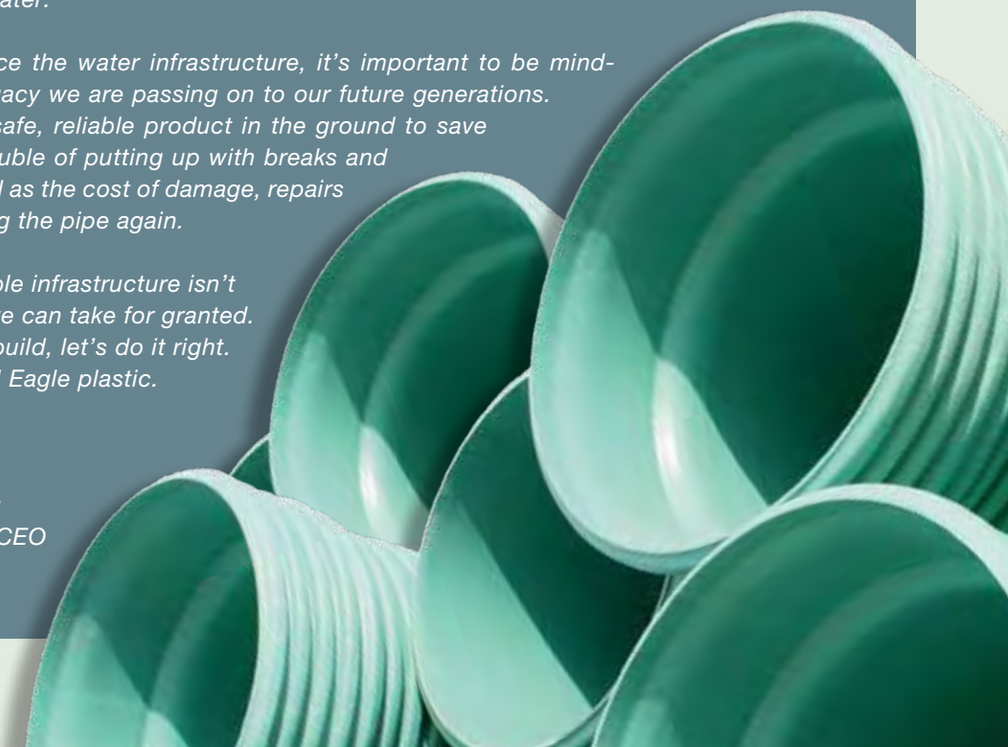
A massive rebuilding effort is just around the corner. Post-World War II water infrastructure systems are reaching the end of their life spans. Long-awaited stimulus funds are making their way to municipalities that had been waiting for federal monies. And there has been a renewed emphasis on conservation, with less acceptance of corroded, leaking pipes that waste water.

As we replace the water infrastructure, it's important to be mindful of the legacy we are passing on to our future generations. Let's put a safe, reliable product in the ground to save them the trouble of putting up with breaks and leaks, as well as the cost of damage, repairs and replacing the pipe again.

A safe, reliable infrastructure isn't something we can take for granted. When we rebuild, let's do it right. Let's use JM Eagle plastic.

Sincerely,

Walter Wang
President & CEO
JM Eagle



JM EAGLE

ONLY AT JM EAGLE CAN YOU GET:

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- The highest level of service
- Expedited deliveries
- All made-in-the-USA products
- The convenience of PVC and PE on one truck

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