

The Sewering



Construction of a box culvert along the main stem of Nine Mile Run, 1928. The culvert is now the base for Greendale Avenue in Edgewood. Collection of STUDIO for Creative Inquiry

Opposite page: Nine Mile Run is one of the few streams in Pittsburgh still above ground for any significant length. Its journey begins at the outfall culvert near Braddock Avenue in the Regent Square neighborhood and flows through Frick Park for just over two miles to the Monongahela River. Nine Mile Run

Watershed Association

of Nine

Stand at the main outfall culvert for Nine Mile Run — the terminus of miles of underground pipe and the beginning of this stream's above-ground journey through Frick Park in Pittsburgh's East End. There is first the overpowering smell of raw sewage

clinging to the air around the culvert. A bank of shale, hollowed out as if by machine, erodes back into a trail that skirts the stream. These are signs of a stream that has been pinched and pushed, buried and broached: a stream in despair.

and Salvaging



Mile Run

By Zachary Falck
and Marijke Hecht

Walk a little ways, though, and it's a different story. The stream curves and meanders, and ducks float in small pools. This is the beginning of the Nine Mile Run urban stream restoration project. To rectify some of the many problems plaguing the stream, small wetlands have been planted with native grasses and shrubs designed to absorb and clean excess rainwater. Water cascades over clusters

of rocks in the stream bed that infuse the water with oxygen for aquatic insects and fish. Even tall, dead trees have been placed — standing — along the stream for a reason: they are a food source for woodpeckers and a home to cavity nesting birds like the black-capped chickadee. These are signs of a sophisticated effort to recreate a habitat that existed before real estate development in the East End transformed this small watershed.

Pittsburgh once had numerous small streams meandering down its slopes, feeding the three rivers that are its anchor. It was a landscape graced by lush, green hillsides, sharp ravines, and close to 37 inches of rain a year. Yet, over time these streams have been buried in underground pipes used to convey stormwater and sewage away



Children playing in Nine Mile Run off of Boyd Avenue in Edgewood, 1920s.

Collection of Ted Radovsky/STUDIO for Creative Inquiry



The main outfall culvert for Nine Mile Run during a rain storm.

Joe Fedor/Nine Mile Run Watershed Association

from residential communities as quickly as possible.

Throughout Pittsburgh's history, treatment of Nine Mile Run has reflected fluctuating public attitudes toward the environment and human health. Once an improvised and neglected sewer, the stream grew into a public health nuisance that people wanted to hide. More recently, Nine Mile Run has been reclaimed as a natural and recreational resource to be protected.

Household and neighborhood health long depended on using Nine Mile Run as a sewer, and over time the stream has been both polluted and cleaned in efforts to improve quality of life. Residential devel-

opment, which had seriously damaged the stream with pollution and culvert construction, has more recently been critical to the rediscovery of Nine Mile Run as a community asset and contributed to its restoration. Nine Mile Run's \$7.7 million habitat improvement project is one of the largest urban stream restorations in the nation.¹ This transformation of what was once

called "stink creek" by nearby residents reflects Pittsburgh's transition from a 19th-century industrial center to a 21st-century, post-industrial city that is manufacturing a new urban environment.²

Histories of our cities are most often explained in terms of how urban landscapes have evolved. Great buildings are erected, streetscapes change or fade, and old structures become vestiges of the past. But cities also depend on natural resources, such as free-flowing water. The use of these resources often shape a city's character, and change over time, too. Over the last 15 years, community members and civic leaders have worked to reorient Pittsburgh towards its

Nine Mile Run sewers, like the rest of the city's 34 sewer systems, discharged sewage directly into the city's rivers rather than carrying it to a treatment plant

waterways. The design and construction of the revamped convention center and new sports stadiums facing the rivers demonstrate this push for reintegration of the urban landscape with its waters.³ Nine miles down the Monongahela from where the Ohio begins, the salvaging of Nine Mile Run attempts the same.

As American cities grew, the construction of sewers proliferated. Urban population jumped from 15 million in 1880 to almost 55 million in 1920; the number of urban places in the U.S. with sewers increased from 200 to 3,000.⁴ Constructing sewers to protect public health often meant burying streams in underground culverts. These streams typically remained buried — out of sight and mind — until the post-World War II environmental movement inspired efforts to reclaim them for natural life and human enjoyment.

Municipal officials and the civic elite in 19th-century America worked to improve the safety of cities, the health of city dwellers, and the comfort of urban life by securing and providing water. Wells, springs, and private companies could not reliably supply enough water for fighting fires, preventing disease epidemics, and fostering cleanliness. Pittsburgh leaders rejected private franchises and instead built the city's first waterworks in 1828. The system provided water, but it did not clean or remove it once used.

In middle class homes, sinks, baths, and toilets came into wider use during the mid-19th century and per capita water use in cities increased threefold or more between the 1850s and 1880s. Privy vaults and cesspools were not designed, nor could they be easily reworked, to accommodate the much greater volumes of wastewater generated by these conveniences. Both regularly overflowed, flooding lots and creating health hazards. In some cases, residents tried to divert waste-water into street gutters originally built for, and typically only legally used for, stormwater. Still, officials and residents consistently gave priority to procuring technologies that *provided* water rather than developing methods or technologies to *dispose* of it.⁵

Pittsburgh officials addressed these worsening sanitary conditions with the 1858 Sewer Act and by adding new executive departments to expand services to residents, including a Department of Public Works to oversee sewer construction. At the time, many sanitary officials believed filth and decaying smells spread disease. Thus, their straightforward goal for a functional sewer system was to wash wastes and their odors off the streets. This law gave the city the financial means to construct street sewers to handle increased wastewater flows. Yet, 17 years later, most of the city's 25 miles of sewers were no longer sufficient and still drained only stormwater, not wastewater, from homes. In 1884, city council reasserted its determination to construct sewers for "the health and convenience of the citizens of Pittsburgh" by amending its means to finance new construction.⁶

Although public health officials advocated building sewer systems that used separate conduits for household wastewater and stormwater, sanitary engineers recommended a single combined sewer to

carry both. Health officials argued for the separate system because they thought it better protected people from sewer gas; engineers favored the combined system because they believed it could remove both household wastewater and stormwater at a lower cost. Pittsburgh officials chose the combined system in the early 1880s in part because engineers did not know of any large-scale, successful sanitary sewer systems to use as models.⁷

At the time, the East End, where Nine Mile Run is located, was among the city's developing residential areas. A streetcar line along Fifth Avenue opened in the 1870s, making the area attractive to the city's elite, whether established professional families or newly rich industrialists, like Andrew Mellon and George Westinghouse. In 1870, population density in the city's crowded downtown was 54 people per acre, while the newly annexed East End was home to about two people per acre. By 1890, there were eight people per acre in the East End (among them, Henry Clay Frick, when his family took up residence in Clayton in 1882).⁸ Such growth resulted in the need for new sewers and improvements for old ones. Yet, when city council formed the East End Sewer Committee in 1885, it neglected to include Nine Mile Run in its initial plan, partially because the municipalities of Wilkinsburg and Edgewood had already developed sewer systems in the watershed and allowed Pittsburgh to connect to their systems. While these communities discharged stormwater overflow into Nine Mile Run, they did not, like the East End, employ the run to carry wastes to the river.

Eight years later, in 1893, Pittsburgh officials re-thought Nine Mile Run's place in the city's sewer system due to the development of Park Place, a neighborhood tucked between Wilkinsburg and what would become the eastern edge of Frick Park. Although the city had formulated a two-decade agreement with



A hop tree (*Ptelea trifoliata*) found near the mouth of Nine Mile Run and listed as threatened in the state of Pennsylvania. Cliff McGill

Wilkinsburg to connect with that municipality's sewer system,⁹ it could not always do so. Thus, in 1894, the Department of Public Works constructed a sewer that ran from Braddock Avenue and emptied directly into Nine Mile Run. It took a year and \$20,109 to excavate the clay, sand, shale, and rock for the three-quarter-mile-long sewer. That same year, a number of private property owners collaborated on a brick and stone sewer in the valley to the Monongahela River.¹⁰ The result was haphazard sewer building and more wastewater flowing directly into the stream.

Other infrastructure projects limited the resources available to build sewers in the Nine Mile Run watershed: filtering the water supply to combat typhoid deaths, metering water use, and undertaking transportation projects like cutting down "the hump" that hindered access to downtown Pittsburgh. In the first few years of the 20th century, Pittsburgh's

typhoid death rate of more than 120 per 100,000 residents remained three times higher than rates in other large cities.¹¹ Department of Public Works Director Edward Bigelow declared the importance of water to the health of the city in 1895:

Nothing is more significant, in its relation to the growth and spread of the residence sections of the city, than the phenomenal extension during these years of sewers and water pipes, running to the rivers in a wide spreading network like the veins and arteries in the human body. Wherever any considerable number of people go to live in a modern city, the water pipe and sewer pipe must follow.¹²

Bigelow's enthusiasm accurately reflected the environmental needs of city residents, but in the case of Nine Mile Run, sewers lagged behind the water pipes. Bigelow's dedication to health, however, did not consider the impact Pittsburgh's sewage would have downstream, which exposed people in other communities to the very problem he wanted to protect Pittsburghers from, as well as harmed fish, aquatic insects, and birds in the urban environment.

In the first two decades of the 20th century, rapid growth in the East End made sewage disposal an ever-increasing environmental problem, although Pittsburgh and its neighboring municipalities continued to make informal arrangements to share existing lines when convenient. Increasing volumes of street and roof drainage in Wilkinsburg regularly flushed sanitary wastes into the run, creating foul smells for Edgewood residents that soon attracted the state's attention.¹³

Passage of the Pennsylvania Pure Waters Act in 1905 gave health officials more power to combat typhoid fever epidemics and to prevent untreated sewage from entering rivers and streams. Although filtration of the water supply substantially reduced typhoid

rates to less than 40 per 100,000, deadly outbreaks continued in the region and compelled the state to pressure municipalities to redirect sewage into treatment plants. Yet, the steady population growth around Nine Mile Run only resulted in more sewage pollution because the permitting process exempted existing systems from the required treatment facilities until they required extension.¹⁴

In response to the state's regulatory interest in the watershed, Pittsburgh designed a new trunk sewer for the entire valley that included a sanitary intercept to carry waste directly to the Monongahela River but not into a treatment plant. Pittsburgh reduced sanitary sewage pressure on the run, while the smaller municipalities exercised more control over

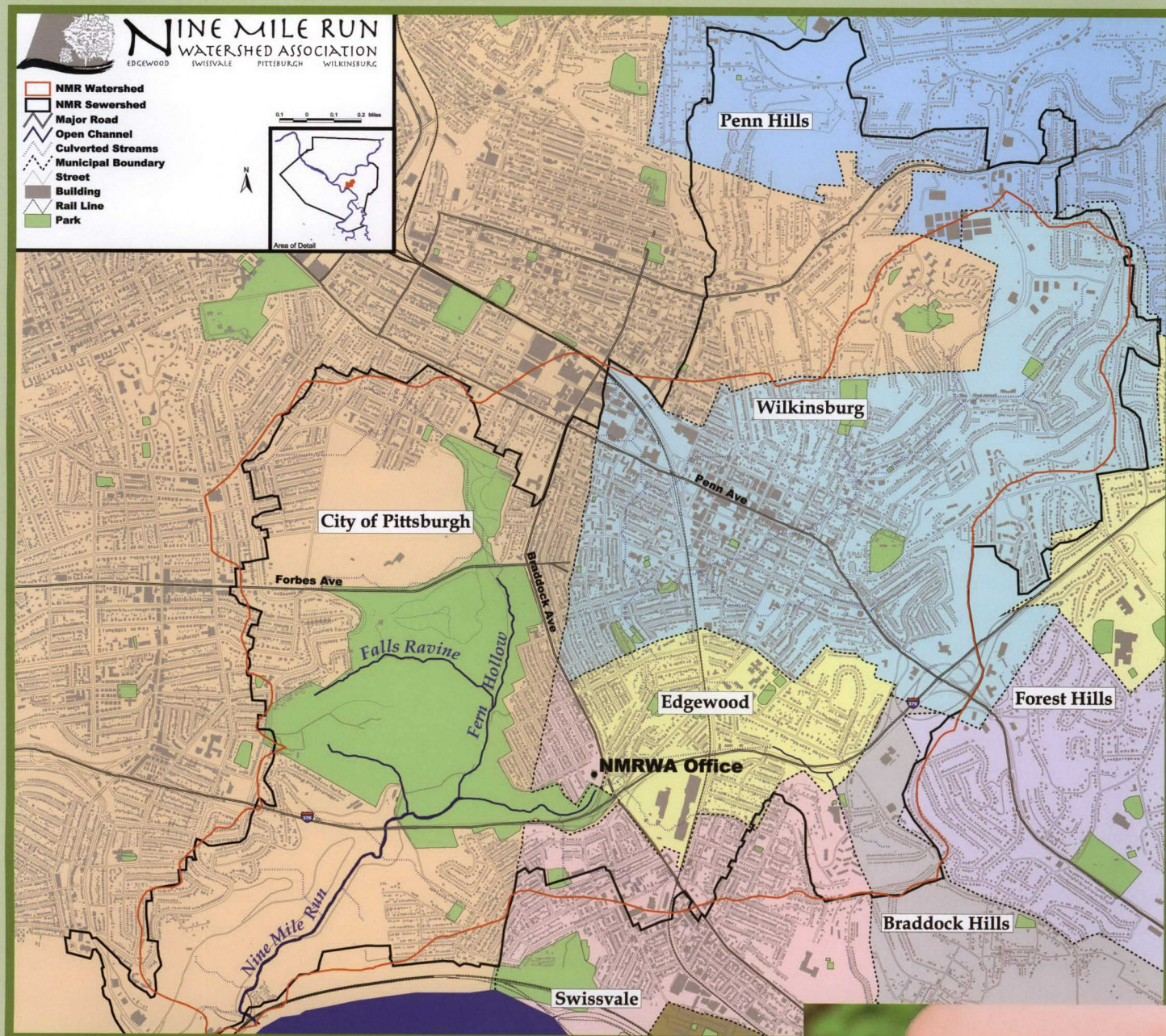
storm drainage. However, this design only alleviated local nuisances; it did not meet state officials' goal of the "ultimate purification of sewerage."¹⁵

In January 1907, Pittsburgh's Chamber of Commerce endorsed the construction of a modern sewage system and treatment plant. The chamber's leaders argued that preventing further environmental problems from arising in Nine Mile Run would "establish a precedent for [Pittsburgh's] future guidance, and set an example for others."¹⁶ Like city officials, chamber leaders anticipated that abating sewage in the stream would improve quality of life. Pennsylvania Commissioner of Health Samuel Dixon warned that sewage discharge into Nine Mile Run and its tributaries, as well

"Rivers are the natural and logical drains and are formed for the purpose of carrying the wastes to the sea."



General condition of Nine Mile Run above Oakwood Street, 1911. Collection of STUDIO for Creative Inquiry



The 6.5-square-mile Nine Mile Run Watershed as it looks today, bounded by the red line. Old stream courses are shown by light blue dotted lines off the main stream. Nine Mile Run Watershed Association

as the Monongahela and Ohio Rivers, had to cease in order to protect the public's "health and even life."¹⁷ Dixon believed the problem serious enough to advocate that Pittsburgh annex neighboring municipalities as a means of overcoming water supply and sewage troubles.

However, the certainty that Nine Mile Run remained a problem did not mean all experts

agreed on how to resolve it. The state's insistence on termination of sewage discharge into the rivers compelled city council, often at odds with the state, to employ noted sanitary engineers George Whipple and Allen Hazen to investigate the city's sewage system in 1909 and 1910. Their report challenged the state's mandate and



A young American toad (*Bufo americanus*). John Moyer

advised the city against allocating funds for a treatment plant. The engineers reasoned that treating the wastes and transferring cleaner water downstream primarily benefited downstream settlements, not the citizens of Pittsburgh. They also argued that mine acids in the river water killed germs and that all municipalities should filter water drawn into their systems rather than treat the sewage leaving their pipes in order to reduce disease.

Whipple and Hazen suggested that ensuring streams and rivers were free of sewage was simply an aesthetic choice rather than a health imperative. To these men, pristine streams were impractical ideals; invoking the conservation ethic of the greatest good to the greatest number, they rationalized using rivers like sewers in service of practical, large-scale sanitation.¹⁸ The impact of sewage on stream life and the surrounding environment was not their main concern. N.S. Sprague, the superintendent of the Pittsburgh Bureau of Construction, seemed influenced by this perspective when he concisely summarized the Whipple and Hazen report with the statement: "Rivers are the natural and logical drains and are formed for the purpose of carrying the wastes to the sea."¹⁹ Thus, as water quality inside the city improved, it deteriorated in its rivers.

The region's polluted waterways did not, however, prevent leaders from imagining how clean waterways could enhance open spaces planned for recreation and respite. The Pittsburgh Civic Commission, appointed in 1909 by Mayor George Guthrie and made up of business people and civic leaders, brought in Frederick Law Olmsted, Jr., son of the famed landscape architect, to evaluate and make recommendations for protection of the Pittsburgh landscape. In his report, Olmsted wrote, "Perhaps the most striking opportunity noted for a large park is the valley of Nine Mile Run. Its long meadows of varying width would make ideal playfields; the stream, when



Workers construct a culvert in Nine Mile Run, 1931. Collection of STUDIO for Creative Inquiry

it is freed from sewage, will be an attractive and interesting element in the landscape."²⁰ But Olmsted's bucolic vision was not to be; Mayor Guthrie was soon replaced, the Civic Commission disbanded, and their ideas and recommendations ignored.

Building sewer lines to prevent nuisances rather than developing a system to treat sewage perpetuated environmental problems in the Nine Mile Run basin. People living in the basin presented frequent complaints about the smells and property damage. Obstructions in the run resulted in a "choking up of the sewers" and flooding of their cellars.²¹ City officials' neglect of a wooden culvert prompted an exchange of letters between property owners and council over the nuisance arising in the sewage-filled stream.²² The Voters' Civic League complained that the problems in handling Nine Mile Run would bring the city "undesirable notoriety."²³ Dixon continued to warn officials that it was ill-advised to continue sewer construction without a master plan.²⁴ In 1916, Nine Mile Run

sewers, like the rest of the city's 34 sewer systems, discharged sewage directly into the city's rivers rather than carrying it to a treatment plant. The city admitted Nine Mile Run was "a complex problem" and attributed "lack of proper State legislation compelling cooperation" to bring municipalities and property owners together to solve it.²⁵

A \$22 million municipal bond vote slated for July 8, 1919, promised to reshape Pittsburgh's landscape and waterways. This bond was designated for a subway system; street and bridge improvements; parks and playgrounds; hospital, fire, and police service; and, water supply, sewer, and drainage systems. "The city, after all, is only a plant for the manufacture of happiness and prosperity for its people," said bond proponents, "and Pittsburgh's plant needs a complete overhauling." The *Pittsburgh Post* admonished the citizenry:



The slag heap along Nine Mile Run looking north. Nine Mile Run flows through the center of the slag heap at its base; the Summerset housing development and Tree Tops apartment complex off of Forward Avenue in Squirrel Hill are visible on the left. John Moyer

“Forward, Pittsburghers!” and argued that municipal improvements would allow Pittsburgh to compete with other cities for greatness: “This is a race for the strong and the liberal, not for the timid and the parsimonious.... Make it a response worthy of the workshop of the world.” *Post* editors declared that a new sewage system would help Pittsburgh become “the healthiest of cities.”

When city residents passed all the issues, *Pittsburgh Sun* editors heralded the results as “the greatest step forward in a long and

honorable history.” The victory dovetailed with America’s participation in World War I and promised jobs for those returning from the war.²⁶

In the Nine Mile Run watershed, city engineers at last built a new sanitary intercepting sewer that removed some sewage from the stream but still delivered it directly into the Monongahela River. In 1921, city council appropriated \$231,000 for sewer construction projects within the Brushton and the East End Avenue Districts. Resi-

dents in northern Homewood petitioned the city to ensure that construction would extend to the city’s northern border. They stated that failing to comply with their petition risked perpetrating a “great injustice” against them. Refuse “floating down” the stream lodged “at the mouth of the sewer,” creating sanitary conditions “worse than with the open creek.” A healthy environment for them meant that the 54-inch brick sewer had to incorporate the northern areas of the East End into the Nine Mile Run system.²⁷

In 1924, council proposed constructing a sewer into “Frick’s Woods,” while the Chamber of Commerce’s Municipal Affairs Committee studied the open sewers marring the park. The chamber reported that preserving this land as a park required careful zoning of the abutting properties in order to regulate uses. The chief engineer of city planning contended that the residential zoning around the land was enough to protect the bequest. The land, south of Frick’s Point Breeze mansion, became a 150-acre park with a \$2 million trust fund when it opened in 1927.²⁸

Pressure to quickly create wealth from real estate had impoverished the city’s landscapes and streams. In the summer of 1926, city council considered whether planting trees could counter the “bleak view” of the city created by the “waste areas denuded of all trees and vegetations.” Likewise, the zoning concerns about Frick’s land reflected worries that slag dumping in the Nine Mile Run stream valley threatened the prospects of the park. Ignoring both Olmsted, Jr.’s plan and objections raised by local residents to the pollution, the city allowed Duquesne Slag Company to continue depositing its slag, a byproduct of the steelmaking process, in the stream corridor for approximately 50 years. When the company ceased dumping operations in 1972, a 20-story-high slag pile — some 17 million cubic yards of waste — filled the valley.²⁹ A once-broad floodplain onto

When city officials and developers agreed to restore rather than bury the waters of Nine Mile Run, a new chapter opened in the relationship between people and water in the East End.



Condition of old wooden drain on Smith Way and damage due to flood, 1911 Collection of STUDIO for Creative Inquiry

which the stream overflowed during wet periods had been transformed into a steep ravine that prevented the lower-most portion of Nine Mile Run from meandering in a natural course. Both the sewer of Nine Mile Run and the dumping of slag along its banks indicated waste dumping was more important to the city than the health of its waterways.

As sewer construction proceeded, city engineers directed more and more of the water that had once flowed freely through a surface stream into a buried sewer running alongside it. In late 1927, city council authorized \$300,000 to construct a large Nine Mile Run trunk sewer for the basin. The sewer would travel through Frick Park to Commercial Street and then on to the Monongahela. The sewer would not only drain Frick Park and surrounding residences, but would also interconnect with private sewers that were discharging wastes into Nine Mile Run. The Engineers' Society noted the conduit would carry sewage from the entire drainage basin as well as an additional 10 percent of the existing combined sewers' stormwater. In removing much of the sewage pouring in Nine Mile Run, the system would also carry runoff and stormwater into the river. In this way, the sewers increasingly did the work once carried out by the stream.³⁰

Throughout the 1930s, the Department of Public Works shifted attention away from the drainage basin. Federally-funded employment relief allowed extensive sewer construction in the Cork's Run, Four Mile Run, Street's Run, Negley Run, and Spring Garden Avenue drainage basins. Yet, \$132,000 was allocated to build a storm sewer south from Forbes Avenue along Fern Hollow through Frick Park to a point on Nine Mile Run northeast of Commercial Avenue.³¹

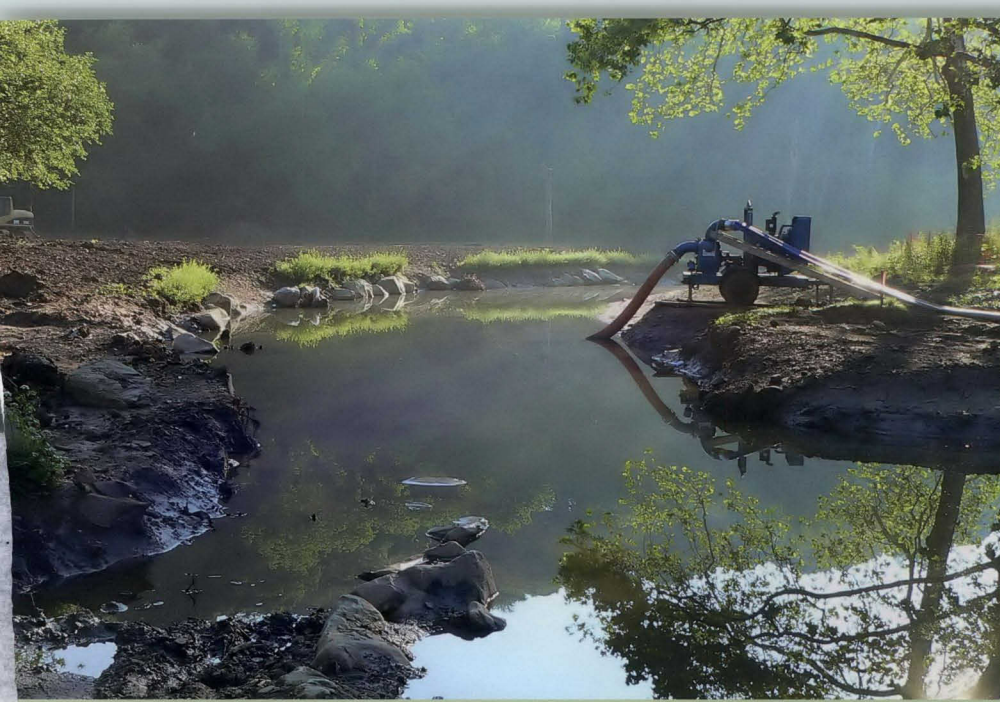
Starting in the 1930s, Works Progress Administration workers pushed for cleaner air with the "Smog and You" campaign, a noise abatement commission was formed, and the city enacted waste paper litter laws. Smoke control was reinvigorated in the 1940s, after St. Louis engineer Raymond Tucker made great strides to reduce smoke in that city. But when the state introduced new legislation to relieve water pollution, Pittsburgh City Council resolved yet again to oppose their plans. The council criticized state legislation that mandated the construction of sewage treatment facilities, believing they had improved the waters as well as they could.³²

The Secretary of Health warned Pittsburgh Mayor William McNair not to be "party to any evasion by your own city to its duty." State officials had decided that "the discharge of sewage or industrial waste into the waters of the Commonwealth is ... not a reasonable or natural use of such waters." Moreover, the state's Clean Stream Bill in 1937 empowered the Sanitary Water Board to issue and enforce waste treatment orders.³³ However, it was not until after World War II ended that the state secured the city's full cooperation.

These problems were addressed nationally with the passage of the Federal Water Pollution Control Act of 1948, and amendments to it in 1956 brought increased study of the nation's major waterways, as well as grants and low-interest loans that allowed municipalities to build long overdue sewage lines and wastewater treatment systems. Presidents Kennedy and Johnson both increased spending for sewage treatment, and the Water Quality Act of 1965 provided millions more to build these systems and increased federal regulation of water quality.

The establishment of the Allegheny County Sanitation Authority (ALCOSAN) in 1946 allowed Pittsburgh and surrounding municipalities — including the fragmented municipal systems in Nine Mile Run — finally to comply with, and even to exceed, state sewage treatment standards.³⁴ A treatment facility on the Allegheny River in 1959 and pipes that had discharged directly into Nine Mile Run and the Monongahela River were now connected to the treatment plant via large pipes that ran along the river banks.

As state and federal policies changed, so did environmental attitudes in the Pittsburgh region, albeit slowly. Beginning in the early 1980s, the city eyed the large slag



Nine Mile Run undergoing restoration, fall 2005. John Moyer

pile at the mouth of Nine Mile Run as a potential development site, and after several stalled plans, bought the 238 acres for \$3.8 million.³⁵ This transition from industrial waste dump to upscale redevelopment marked a shift in Pittsburgh's identity from an industrial city to one trying to highlight its livability.

In the first stages of redevelopment, little attention was paid to the value of the stream as a potential community resource. Initial plans called for burying Nine Mile Run in order to level the slag pile and create room for 1,000+ houses.³⁶ This decision would have entombed the stream for good. However, in 1996, faculty at the STUDIO for Creative Inquiry at Carnegie Mellon University recognized the value of Nine Mile Run as a community resource and began a three-year study of the stream valley's water quality, animals, and plants. They discovered that, despite pollution problems, the valley was still home to abundant wildlife, including 22 species of mammals, 189 kinds of birds, and 29 species of amphibians and reptiles. It was also found to have more than 250 plant species, including the hop tree (*Ptelea trifoliata*), listed as threatened in Pennsylv-

nia. The group successfully advocated for stream restoration to reduce pollution, to provide better habitat for these species, and most importantly to give urban residents direct access to water and open space by extending Frick Park's borders.³⁷

When city officials and developers agreed to restore rather than bury the waters of Nine Mile Run, a new chapter opened in the relationship between people and water in the East End. By choosing to keep the stream, the city averted not only the potential problems with water that can flow from careless redevelopment, it also retained more options for managing the watershed as urban needs and environmental values continue to evolve. Today's development, called Summerset, consists of fewer housing units (770) but creates 100 acres of new parkland for the region's residents, harkening back to the vision of Olmsted, Jr.³⁸

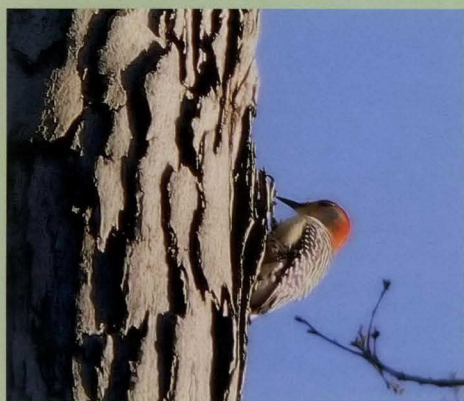
Local, regional, and federal funding have been secured for the \$7.7 million stream restoration project, and the U.S. Army Corps of Engineers is halfway through the work. During rains, the restored Nine Mile Run will mimic natural stream processes such as overflowing during wet weather into a newly created floodplain populated with native wetland plants that slow, filter, and clean polluted water — a process the stream once accomplished all along its course.³⁹

Upstream improvements to sewage infrastructure are also occurring. Federal requirements to improve water quality, stemming from the 1972 Clean Water Act, led to action in the 1990s by the Pennsylvania Department of Environmental Protection requiring the upstream boroughs of Edgewood, Swissvale, and Wilkinsburg to repair sewage infrastructure and reduce sewage inputs into the stream. However, sewage from combined sewer overflows persists, and regional improvement to the city-combined sewer system is projected to cost as much as \$3 billion.⁴⁰

All the municipalities in the watershed are faced with new Non-Point Source Pollution Discharge Elimination (NPDES) requirements that mandate water quality improvements. Both regulations are evidence that, a century after the Pennsylvania Pure Waters Act attempted to improve public health by mandating cleaner waters, our region's waterways need more care to become safer for human recreation. In fact, ALCOSAN continues to issue sewage overflow warnings on nearly 50 percent of recreational days for all three rivers.⁴¹

The transformation in environmental values that is inspiring the efforts to restore Nine Mile Run also suggests infrastructure development is not just a historical topic but ever-present and ongoing, even if often underground. Nine Mile Run suffered as unplanned development, tenuous compromises, competing commitments, and financial hurdles allowed sewage to flow into the stream. Completing the restoration of the stream and making it a valuable resource again requires overcoming these looming imperfections from the past. The sewerage and salvaging of Nine Mile Run suggests that our abundance of water can become an environmental good rather than remain an environmental hazard, allowing people in Pittsburgh and the region to establish new relationships with the waters that flow through and under a changing urban landscape.





Red-bellied woodpecker (*Melanerpes carolinus*) near Nine Mile Run. John Moyer

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¹ Allison M. Heinrichs, "Frick Park Wetland Will Open – Sans the Bad Smell," *Pittsburgh Tribune Review*, 9 September 2005, B-1, B-7; M. Ferguson Tinsley, "Phase 1 of Nine Mile Run Restoration Project Finished," *Pittsburgh Post-Gazette*, 15 September 2005, E2-1.

² The Green Building Alliance and the Pennsylvania Environmental Council have mounted one recent effort to change Pittsburgh's image with the website www.pittsburghgreenstory.org.

³ Tim Collins, Edward K. Muller, and Joel A. Tarr, *Pittsburgh's Rivers: From Urban Industrial Infrastructure to Environmental Infrastructure*, Institute of History, German Marshall Fund, forthcoming.

⁴ Langdon Pearse, *Modern Sewage Disposal* (New York, 1938), 13.

⁵ Joel A. Tarr, "The Separate vs. Combined Sewer Problem," in *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective* (Akron: University of Akron Press, 1996), 132-4. An important synthesis of decades of research on urban sanitation is Martin V. Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore: Johns Hopkins University Press, 2000).

⁶ Terry F. Yosie, "Retrospective Analysis of Water Supply and Wastewater Policies in Pittsburgh, 1800-1959," (Ph.D. diss., Carnegie Mellon University, 1981), 10-55; Joel A. Tarr and Terry F. Yosie, "Critical Decisions in Water and Wastewater Treatment," in *Devastation and Renewal: An Environmental History of Pittsburgh and Its Region* (Pittsburgh: University of Pittsburgh Press, 2003), 68; *The Municipal Record: Proceedings of Select Council of the City of Pitts-*

burgh, 30 June 1884, 55 [hereafter cited as *MRCP*].

⁷ Tarr, "Separate vs. Combined Sewer Problem," 131-53; Yosie, 113.

⁸ Joel A. Tarr, "Infrastructure and City-Building in the Nineteenth and Twentieth Centuries," in *City at the Point: Essays on the Social History of Pittsburgh*, ed. Samuel P. Hays (Pittsburgh: University of Pittsburgh Press, 1989), 226-7; Joel A. Tarr, *Transportation Innovation and Changing Spatial Patterns in Pittsburgh, 1850-1934* (Chicago: Public Works Historical Society, 1978), 10-11; John N. Ingham, "Steel City Aristocrats," in *City at the Point*, 274-6.

⁹ Nine Mile Run Valley Sewerage Application, August 1909, 2. Water Supply and Sewage Report and Permit Books; Record Group 11, Records of the Department of Health; Pennsylvania State Archives. [hereafter cited as PSA-NMRV]; *MRCP*, 2 March 1894, 135.

¹⁰ City of Pittsburgh, *Annual Report of the Department of Public Works* (1894): 68-87 [hereafter cited as *ARDPW*]; *ARDPW* (1896): 98; *MRCP*, 29 October 1894, 229.

¹¹ Tarr and Yosie, 73.

¹² *ARDPW* (1895): 13.

¹³ PSA-NMRV, 3-9.

¹⁴ Yosie, 186-96; Tarr and Yosie, 73.

¹⁵ *ARDPW* (1907): 572.

¹⁶ *Legal Questions in Connection with Sewage Disposal for Pittsburgh: Report of the Committee on Legislation to the Chamber of Commerce of Pittsburgh* (1907), 8.

¹⁷ PSA-NMRV, 22.

¹⁸ Yosie, 226-50.

¹⁹ N. S. Sprague to J. G. Armstrong, 9 February, 1912, as quoted by Tarr and Yosie, 76.

²⁰ Frederick Law Olmsted, *Pittsburgh Main Thoroughfares and the Down Town District: Improvements Necessary to Meet the City's Present and Future Needs* (Pittsburgh, 1911), 119-120.

²¹ *MRCP*, 5 March 1912, 99.

²² John M. Davies to Robert Garland, Document #3039, City of Pittsburgh Clerk's Office [CPCO].

²³ *MRCP*, 2 April 1912, 171.

²⁴ S.G. Dixon to Secretary of the Council, 28 March 1912, reprinted in *MRCP*, 2 April 1912, 172.

²⁵ *The City of Pittsburgh and Its Public Works* (Pittsburgh, 1916), 42.

²⁶ *Pittsburgh Sun*, 3 July 1919, 14; *Pittsburgh Post*, 7 July 1919, 6; *Pittsburgh Post*, 8 July 1919, 6; *Pittsburgh Sun*, 9 July 1919, 6.

²⁷ Ordinance No. 171, *MRCP*, 1921, Appendix: 129-30. Petition from Residents of the 13th Ward (Wheeler and Blackadore Streets) to Council, 10 November 1921, Document #4226, CPCO.

²⁸ *MRCP*, 27 October 1924, 644; Pittsburgh Chamber of Commerce, *The Chamber of Commerce Yearbook for 1925-1926*, 22. U. N. Arthur to Robert Clark, 17 May 1926, Docu-

ment #903, CPCO. A. V. Snell to the President and Members of Council, 24 October 1924, Document #1953, CPCO.

²⁹ *MRCP*, 28 June 1926, 431; Andrew S. McElwaine, "Slag in the Park," in *Devastation and Renewal*, 189.

³⁰ Ordinance No. 845, *MRCP*, 1927, Appendix: 584-5. *Pittsburgh: Commemorating the 50th Anniversary of the Engineer's Society of Western Pennsylvania* (1930), 48.

³¹ Ordinance No. 18, *MRCP*, 1931, Appendix: 12-3. Ordinance No. 255, *MRCP*, 1935, Appendix: 188. Ordinance No. 335, *MRCP*, 1936, Appendix: 237.

³² Sherie R. Mershon and Joel A. Tarr, "Strategies for Clean Air: The Pittsburgh and Allegheny County Smoke Control Movements, 1940-1960," in *Devastation and Renewal*, 149-51; *MRCP*, 18 March 1935, 146-7.

³³ Edith MacBride-Dexter to William N. McNair, 18 April 1935, Document #3490, CPCO. J. R. Hoffert to Cornelius Scully and City Council of Pittsburgh, 16 May 1945, Document #2493, CPCO. Yosie, 344.

³⁴ ALCOSAN formed in 1946, but did not begin treating sewage until 1959.

³⁵ McElwaine, 190.

³⁶ As reported on the Urban Redevelopment Authority of Pittsburgh website in their showcase projects, http://www.ura.org/showcaseProjects_summerset3.html.

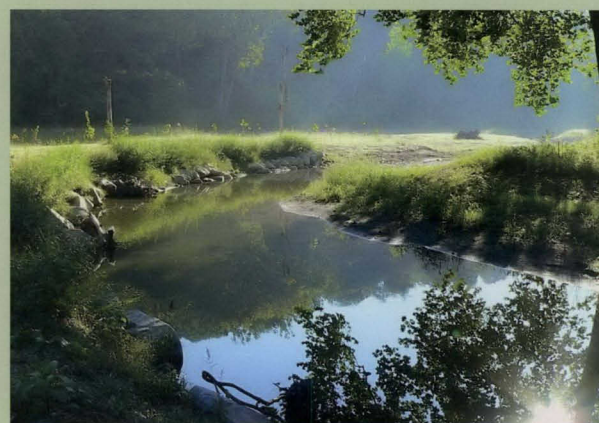
³⁷ Collins, Timothy, et al. *Nine Mile Run Watershed Rivers Conservation Plan*, (Pittsburgh: Department of Conservation and Natural Resources, 1998), 10.

³⁸ As reported on the Urban Redevelopment Authority of Pittsburgh website in their showcase projects, http://www.ura.org/showcaseProjects_summerset3.html.

³⁹ Deborah Weisberg, "Contractors, landscaper are close to wrapping up Nine Mile Run project," *Pittsburgh Post-Gazette*, 11 December 2005, D-160.

⁴⁰ Don Hopey, "EPA backs off sewage policy change," *Pittsburgh Post-Gazette*, 20 May 2005, A-6.

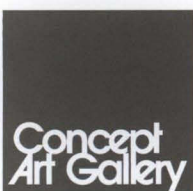
⁴¹ As reported on the 3 Rivers Wet Weather Demonstration Program website, <http://www.3riverswetweather.org>, last updated 1/8/2006.



A newly-created meander along Nine Mile Run, part of the stream restoration project. John Moyer



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