



Stormwater Management Utility

2023 Annual Report
May 2024



Lakewood
Public Works

The Stormwater Management Utility (Utility) provides services and improvements throughout the City of Lakewood (City) such as:

- Maintenance of existing drainage facilities,
- Water quality monitoring, testing, and resolution of pollution issues,
- Funding for improvements to the drainage system,
- Replacement of older, deteriorated facilities, and
- Emergency response to street and drainageway flooding problems during and after significant storm events.

Maintenance

Without maintenance, many drainage facilities lose their capacity to handle the amount of water for which they were designed. Debris is washed into the drainage system where it accumulates and decreases the capacity of inlets, channels, culverts and pipes. Reduced conveyance capacity increases flooding risk.

The Stormwater Management Utility is focused on minimizing damage to property by ensuring the stormwater system is clean and functioning properly. The maintenance program is a cyclical program that ensures certain facilities are inspected every two years. All obstructions are removed the same year as they are identified during inspection. Last year, the following routine work was completed:

- 2,467 inlets were inspected;
- Over 25 miles of gulches were inspected;
- 152 cubic yards of debris were removed from gulches and waterways; and
- Approximately 118 trash racks and grates were inspected after every storm.

The effectiveness of the storm sewer system is reduced when the grates/ pipes get plugged with debris not meant to go into the system, which may cause flooding.





Many abandoned camps were found along drainageways. Trash and debris creates environmental problems and can wash into the stream during storms, clogging culverts and polluting the stormwater.

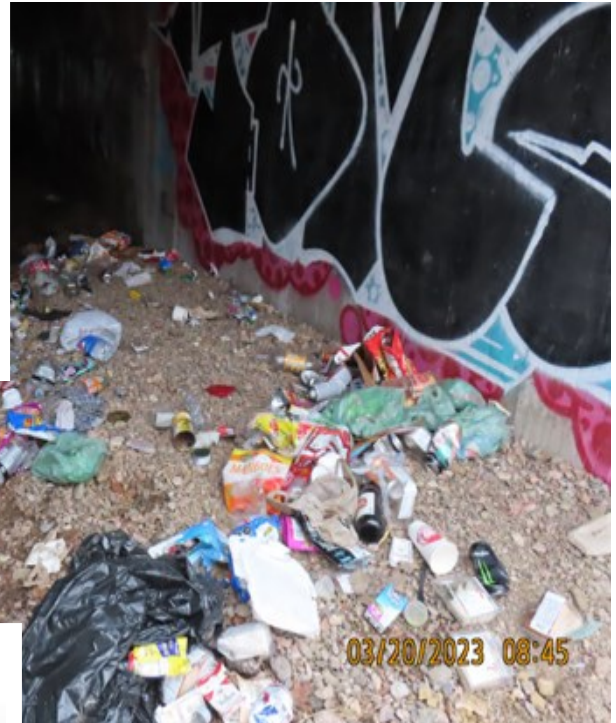
In 2023 Stormwater Utility crews and contractors removed trash from several camps throughout the city.



The contractor removed 152 cubic yards of transient camp debris for a cost of approximately \$21,647.50.



Before



After Cleanup

Lakewood stormwater assets were put the test with record breaking rainfall. Many assets failed due to a variety of factors, including the unusually large amount of precipitation. In the Green Mountain area of Alkire and Utah stormwater crews created a new drainage system. The old failing pipes ran through the back yards of 4 homes causing a large sinkhole in one of the yards. By building a new drainage system Lakewood was able to eliminate the pipes running through the backyards, and improve the drainage in this area.





Sediment builds up over time at entrances to culverts and bridges. Utility crews periodically remove the sediment and vegetation to restore the channel capacity. If you notice an area affected by sediment build up please submit a request use the following link: <https://www.lakewood.org/Government/Departments/City-Managers-Office/Communications/Request-Lakewood-service-request-FAQ>



Some of the underground storm sewer system has reached the end of its useful life and the Stormwater Management Utility replaces pipes and culverts as necessary. The utility attempts to stay away from metal pipe, its only used in areas with very low pipe coverage. In 2023 stormwater crews replaced over 1,000 feet of pipe.



Outreach and Working With Our Community

Adopt A Gulch

The Adopt A Gulch program encourages scout troops, neighborhood organizations and other groups to become stewards of a section of gulch. With support from Stormwater Management Utility crews, Adopt A Gulch groups pick up trash and remove debris from the floodplain and channel one or two times a year.



A new Lakewood business started "Gulchfest" which promotes removing trash and debris from McIntyre Gulch.

Colorado Watershed Assembly members celebrate another successful clean up of the Iliff Gulch Tributary to Bear Creek



Construction Projects

The Stormwater Management Utility undertakes construction of several drainage projects each year. Before construction can begin, the Utility activities include:

- Obtaining input from affected property owners during the design process
- Designing the improvements and preparing plans
- Acquiring necessary easements for the proposed work
- Identifying funding from the Utility's revenue and the Mile High Flood District
- Receiving bids from contractors
- Notifying adjacent property owners of the construction activities



The Utility partners with the Mile High Flood District (MHFD) to improve major drainageways and for maintenance projects along major drainageways. The District provides technical expertise and funds for many of the Utility's projects. The District's funds are derived from a property tax collected throughout the metropolitan region. Obtaining District funds for major improvement projects requires city matching funds. The Utility provides the required matching funds to partner with MHFD to complete major drainage improvements. The Utility prioritizes the District's maintenance projects and routine maintenance activities, which do not require matching funds.

Mile High Flood District funds budgeted for use in Lakewood during the year included:

- Capital projects: \$775,000 (North Dry Gulch)
- Flood Hazard Area Delineation projects: \$100,000 (Bear Creek MDP FHAD)
- Maintenance/restoration projects: \$675,000
- Routine maintenance activities: \$105,000

The following pages highlight some of the construction activities during the year.

Mansfield and Teller - Undersized storm drain was replaced with a new storm drain sized to match upstream pipe size. This project was designed in house by the public works design section and installed in house by the public works maintenance crew. Total cost was approximately \$8,136 and was funded by the Stormwater Management Utility.



Undersized pipe was removed



A new storm sewer was installed to match upstream pipe size.

Dry Gulch—Saulsbury St to Pierce St. - Construction of this channel restoration project began in late 2022 and construction was completed summer 2023. The project included removing the failing concrete-lined channel and reconstructing the channel with concrete slope paving, boulder block walls and a riffle pool channel bottom. Construction cost of approximately \$1,500,000 will be paid for entirely by the Mile High Flood District maintenance funds.



Before

Deteriorated concrete channel lining



After

Retaining wall and natural channel

North Dry Gulch—CP1A - This is the first phase of the North Dry Gulch project from Lamar St to Dover St. This phase of the project involved early action items such as tree removal and installation of a storm lateral and inlet. The lateral pipe and inlet were installed to accommodate an adjacent private development under construction and also to provide utility clearances to make room for the mainline pipe along 14th Avenue that will be installed in Phase 1. Phase 1 is anticipated to begin construction in 2024.



Drainageway Maintenance Projects Under Construction

McIntyre Gulch at Urban St - McIntyre Gulch downstream of Urban Street (at Alameda Ave and Urban St) has erosion and steep banks. The erosion has caused settlement of the adjacent sidewalk and retaining walls. Steep slopes from Alameda Ave pose risks to drivers. Proposed design includes extension of the existing box culvert under Urban Street, boulder retaining wall and riprap along the channel bottom. This project was funded by the Stormwater Management Utility and Mile High Flood District.



Deteriorated concrete channel lining will be removed and the channel reconstructed. Sidewalk will be realigned and reconstructed.



Construction began in December 2022. Construction will be completed in Spring 2024.

Projects in the Design Stage

Sidewalk Improvements on 20th Avenue (West of Nelson Street) - Storm sewer improvements will be constructed to address local flooding that has occurred along 20th Avenue. Improvements include construction of a 36-inch to a 42-inch diameter storm sewer with storm inlets, and curb, gutter and sidewalk along the south side of 20th Avenue.

This project will also extend the existing irrigation ditch culvert under 20th Avenue, east of Owens Ct. Preliminary design of this project has been completed and construction is anticipated in 2024.



Existing culvert crossing



Existing flooding on 20th Ave.

Miller Ct - This project will clear vegetation and extend the curb, gutter and sidewalk along Miller Court. The project will also construct a small retaining wall to hold back the slope as well as correct the ponding problems in the street. Preliminary design of this project has been completed and construction is anticipated in 2024.



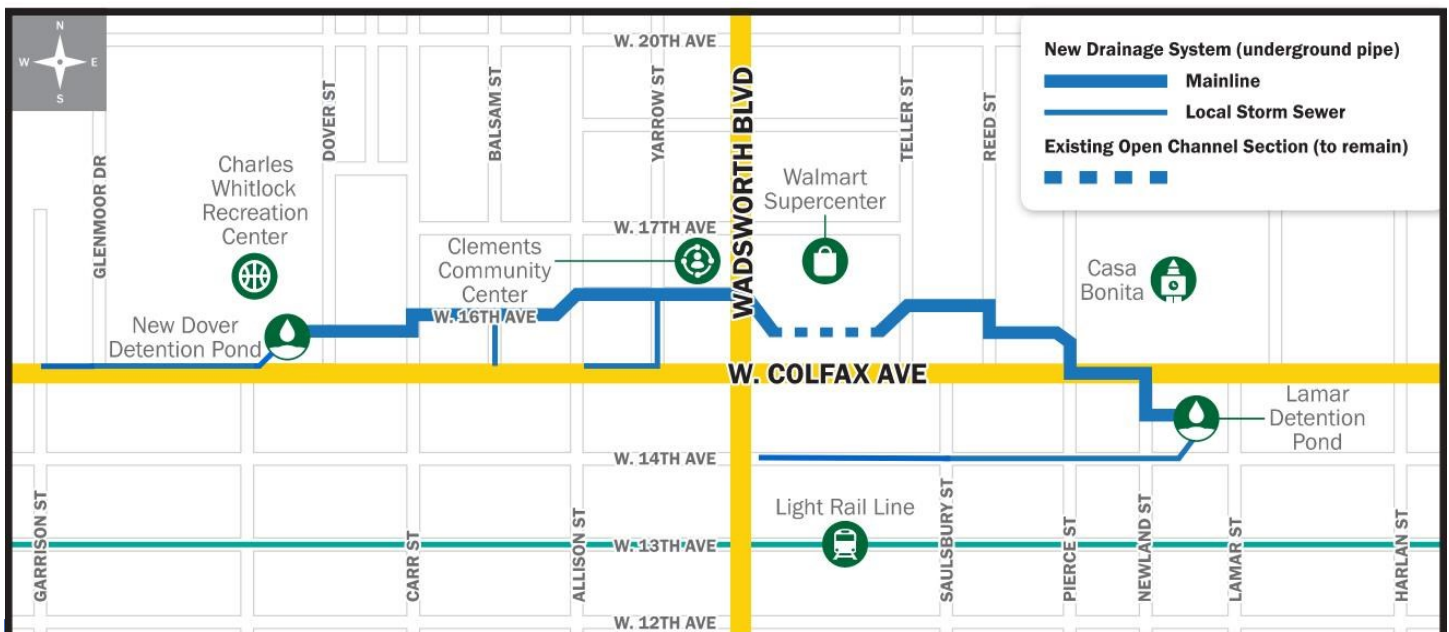
Vegetation covering existing sidewalk area

North Dry Gulch—Lamar Street to Dover Street - Design work continued in 2023 with the focus of utility coordination and preparation of final design plans for the 14th Avenue storm sewer between Vance Street and the Lamar Detention pond located north of 14th Avenue at Marshall Street. The 14th Avenue storm sewer is Phase 1 of four major phases of the North Dry Gulch project and is designed to alleviate flooding along the 14th Avenue corridor including overflows from the Home Depot site at 14th Avenue and Saulsbury Street. Construction of the 14th Avenue storm sewer will begin early 2024.



The other three major phases of the North Dry Gulch project include final design and construction of a storm sewer for Phase 2 from Newland Street to Pierce Street, Phase 3 from Pierce to Teller Street, and Phase 4 from Wadsworth Boulevard to Dover Street. These large diameter pipe/box culvert storm sewer systems will carry the 100-year storm to alleviate flooding that occurs within one block north and south of West Colfax Ave between Dover Street and Lamar Street. This multi-year project is anticipated to cost \$60M and is funded by the Utility and the Mile High Flood District. For more information about this project, please visit the project webpage at www.lakewood.org/northdrygulch.

Conceptual Illustration



Drainage Master Planning and Updated Floodplain Studies

Major drainageways often cross jurisdictional boundaries and the Stormwater Management Utility partners with the Mile High Flood District and other jurisdictions to coordinate master planning efforts. This results in cost-effective and cohesive planning among jurisdictions.

Floodplain mapping is updated to reflect current conditions in the watershed and to accurately show the limits of the floodplain. Flood Hazard Area Delineation studies are sponsored by the Mile High Flood District with participation from the Stormwater Management Utility and other affected jurisdictions.

The Stormwater Management Utility took part in the following floodplain updates in 2023:

Bear Creek downstream of the Reservoir - This study area of Bear Creek begins at the downstream side of Bear Creek Reservoir and runs through the south side of Lakewood. This major drainageway includes portions of the City and County of Denver's Bear Valley neighborhood near US-285 between S Wadsworth Blvd and S Sheridan Blvd, then continuing through the Fort Logan neighborhood up through S Lowell Blvd. The Study area commences at the confluence with the South Platte River in the City of Sheridan's Riverpoint development

The Mile High Flood District in partnership with the Utility, Denver, and Sheridan began work on updating the drainageway masterplan and Flood Hazard Area Delineation Study (FHAD) for Bear Creek downstream of the Reservoir. The total cost of the master plan is approximately \$200,000 paid 50% by the district, 25% Lakewood, 17.5% Denver, and 7.5% Sheridan. The FHAD update is approximately \$150,000 and is paid entirely by the Mile High Flood District.

Floodplain Changes

Improvements to major drainageways sometimes result in the 100-year floodplain or floodway being narrowed or removed from properties. These modifications result in reduced potential for flood damage and in some cases relieve property owners from the need to obtain flood insurance.

The following floodplain changes were approved by The Federal Emergency Management Agency (FEMA) in 2022:

- Physical Map Revision - North Dry Gulch
 - * “The Judson” downstream of West 14th Avenue to Lamar Street LOMR 22-08-02888P, 1/6/23,
 - * “The Brickyard” new culvert 9’ x 6’ box culvert upstream of Harlan Street and 13th Street intersection to just upstream of Lamar Street CLOMR 23-08-0340R, 2/23/24,
 - * “West Colfax four/6400 West Colfax” channel relocation, grading/fill from Lamar Street upstream of West Colfax and downstream of Newland, CLOMR 23-08-0212R, 9/29/23,
 - * “Channelization, fill and grading between Pierce Street and Saulsbury Street north of 10th Avenue, CLOMR 22-08-0076R, Dated 5/25/22.

Stormwater Quality

The discharge of natural precipitation through Lakewood's storm sewer system affects the health of aquatic life in Lakewood and downstream in the South Platte River. The city is required by the Colorado Department of Public Health and Environment (CDPHE) to provide a water quality program designed to:

- Educate our residents about water quality and their actions that can harm or improve water quality,
- Respond to all reports of water pollution and eliminate any pollutant sources, and
- Monitor the stormwater quality in Lakewood's waterways.

Monitoring is conducted at locations within the city to identify and eliminate pollutant sources. The Utility identified and resolved more than 39 illicit discharges of gasoline, motor oil, antifreeze, hydraulic fluid, concrete washout water, restaurant grease, raw sewage and sediment.

Additional monitoring is also conducted in cooperation with other entities. The Utility's cooperative approach results in significant cost efficiencies and logical solutions to stormwater issues that cross jurisdictional boundaries. Some of the joint project efforts include:

- Sharing technical data and costs among Denver, Aurora, Mile High Flood District and Lakewood for implementation of State-required permit provisions.
- Participating as a member of the Bear Creek Watershed Association and the Bear Creek Watershed Foundation to protect water quality in Bear Creek and Bear Creek Lake.
- Monitoring stormwater quality at five sites in Bear Creek Lake, seven locations on Turkey and Bear Creeks upstream of the park, and six locations along the South Platte River.
- Monitoring of Lakewood's discharge points to the South Platte River was done in partnership with Denver, Aurora, and the Mile High Flood District.



The Utility worked with Community Resources to post notices for park users when blue green algae was detected in Bear Creek Lake. This type of algae can be harmful to people and pets if ingested.

Excessive nutrients, such as phosphorus from lawn fertilizers and excessive soil erosion, were causing a toxic blue green algae bloom annually in Big Soda Lake.



The Utility and the Community Resources Department conducted an environmentally safe application of bentonite clay to the waterbody eliminating the nutrient problem.

Community Resources and the Utility modified an existing watercraft to reduce application costs.



This approach was successful and no blue green algae was detected in the Stone House Pond during 2021. Other locations will be considered for this treatment in future years.

Educational efforts are designed to reach as many groups as possible that may affect municipal stormwater quality. Educational programs during the year included:

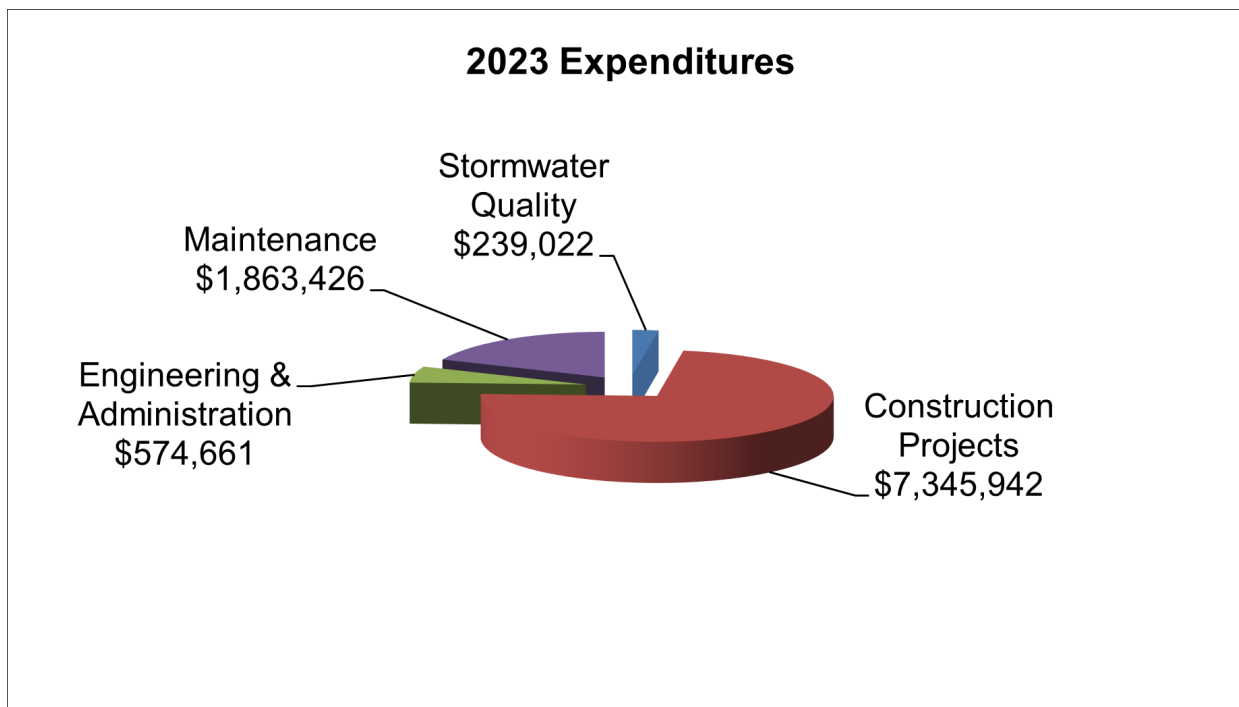
- Installing “Dump No Waste - Drains to Stream” medallions on storm sewer inlets.
- Distributing pollution prevention booklets to industrial and commercial businesses.
- Providing a brochure titled “Managing Your Household Wastes” to residents.
- Electronically distributing brochures encouraging contractors to participate in the Red Rocks Community College courses on erosion, sediment control and construction site management.
- Airing YouTube videos about proper disposal of used cooking oil and “No Leaf Left Behind,” a video to encourage bagging or composting yard waste.
- Continuing to air “Protecting Our Waterways Through BMPs” and other water quality public service announcements on Lakewood8.
- Worked with Alameda Connects to install educational public stormwater art.



Financial Summary

The Utility was established in 1998 and at that time, the city's capital need for drainage improvement was estimated to be \$60 million. Since then, the construction cost inflation and identification of additional needs have pushed the estimated cost to between \$200 and \$250 million.

Total Stormwater Management Utility revenue in 2023 was approximately \$6.04 million dollars. The Utility's expenditures do not equal revenue every year. During some years, revenues will exceed expenses as funds are set aside for larger projects. Many projects will require several million dollars for completion. During years when larger projects are constructed, expenditures exceed revenue.



Beginning in 2000, property owners throughout Lakewood have received annual bills for stormwater management. Nearly 38,000 properties are billed each year. In 2023, single-family homeowners were charged a fee of \$52.68 per year. Other property owners pay a proportional amount based on the impervious area on each property.

In 1998 when the Lakewood fee was established, the average cost of Colorado stormwater utilities was \$3.11 per month. The average cost has since more than tripled to \$11.23 per month. The chart below compares monthly costs for stormwater utilities in Colorado.

| Community | Monthly cost for a Single-Family Home in dollars |
|--------------------------------------|--|
| Boulder | 27.11 |
| Greeley | 25.40 |
| Berthoud | 24.50 |
| Englewood | 20.63 |
| Loveland | 19.87 |
| Longmont | 16.70 |
| Denver | 12.66 |
| Erie | 11.98 |
| Fort Collins | 11.54 |
| Aurora | 11.21 |
| Golden | 9.75 |
| Littleton | 9.41 |
| Parker | 9.17 |
| Colorado Springs | 8.00 |
| Castle Rock | 7.97 |
| Southeast Metro Stormwater Authority | 7.65 |
| Arvada | 7.42 |
| Westminster | 6.00 |
| Windsor | 5.78 |
| Pueblo | 5.36 |
| Lakewood | 4.25 |
| Federal Heights | 3.15 |
| Woodland Park | 2.00 |
| Northglenn | 2.00 |



Conclusion

Throughout 2023, the Stormwater Management Utility (Utility) diligently worked to maintain and improve Lakewood's stormwater system. The Utility is focused on three key areas: maintenance, construction, and planning for the future.

Maintenance:

The Stormwater Management Utility is providing care for the existing drainage system with a limited systematic maintenance program. Many of the pipes and culverts in the stormwater system are nearing the end of the expected service life. In recent years more of the Utility's resources have been needed for repair and replacement, often in an emergency after a pipe failure. This is expected to continue and accelerate as the stormwater system ages. Crews conducted inspections and removed debris from inlets, gulches, and waterways. In total, 2,467 inlets and over 25 miles of gulches were inspected, while 152 cubic yards of debris were removed.

Construction:

The Utility invested in constructing several new drainage projects to improve the city's stormwater management capabilities. These projects included replacing an undersized storm drain at Mansfield and Teller, completing construction on the Dry Gulch channel restoration project, and finishing early action items for Phase 1 of the North Dry Gulch project.

Planning for the Future:

Effective stormwater management requires long-term planning and coordination. To that end, the Utility collaborated with the Mile High Flood District (MHFD) and other jurisdictions to coordinate master planning efforts and update floodplain studies. These collaborative efforts resulted in floodplain changes being approved by the Federal Emergency Management Agency (FEMA), clearly defining where there are risks for flooding and potentially relieving some property owners from mandatory flood insurance.

Cover photo: Bear Creek Lake Park in winter courtesy of the Community Resources Department

Photo page 18: Courtesy of Community Resources Department

All other photos courtesy of Stormwater Management Utility staff