

MAKING SEWERS DYNAMIC: EXPLORING 2 UTILITIES IN ONE



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Water itself is the only substance that exists in liquid, gas and solid form. Cool, huh?

Did you know that the biggest source of pollution is actually you and me? We pollute our waterways when we pour used oil into storm drains, use too much salt in the winter on our sidewalks and driveways, excessively use fertilizer or pesticides on our lawns, or don't dispose of food grease properly. That's why it's so important for us to learn how to prevent pollution and then teach our friends and family about it, too.

PURPOSE

The Metropolitan St. Louis Sewer District (MSD) works to protect your health, safety, and water environment. We also want to protect the environment and preserve it for many years to come. This book is intended to be used exclusively for educational purposes. It is a teacher's resource guide for classroom use.

And, remember:

Do **YOUR** part—taking care of wastewater and stormwater starts with **YOU!**

Water is a renewable source, meaning the same water you used to brush your teeth this morning could be the same water that was once frozen over during the Ice Age or that once rained down on Lewis and Clark during their expedition.

WELCOME

On February 9, 1954, the Metropolitan St. Louis Sewer District was formed to provide a metropolitan-wide system of wastewater treatment and sewer facilities for the collection, treatment, and disposal of sewage.

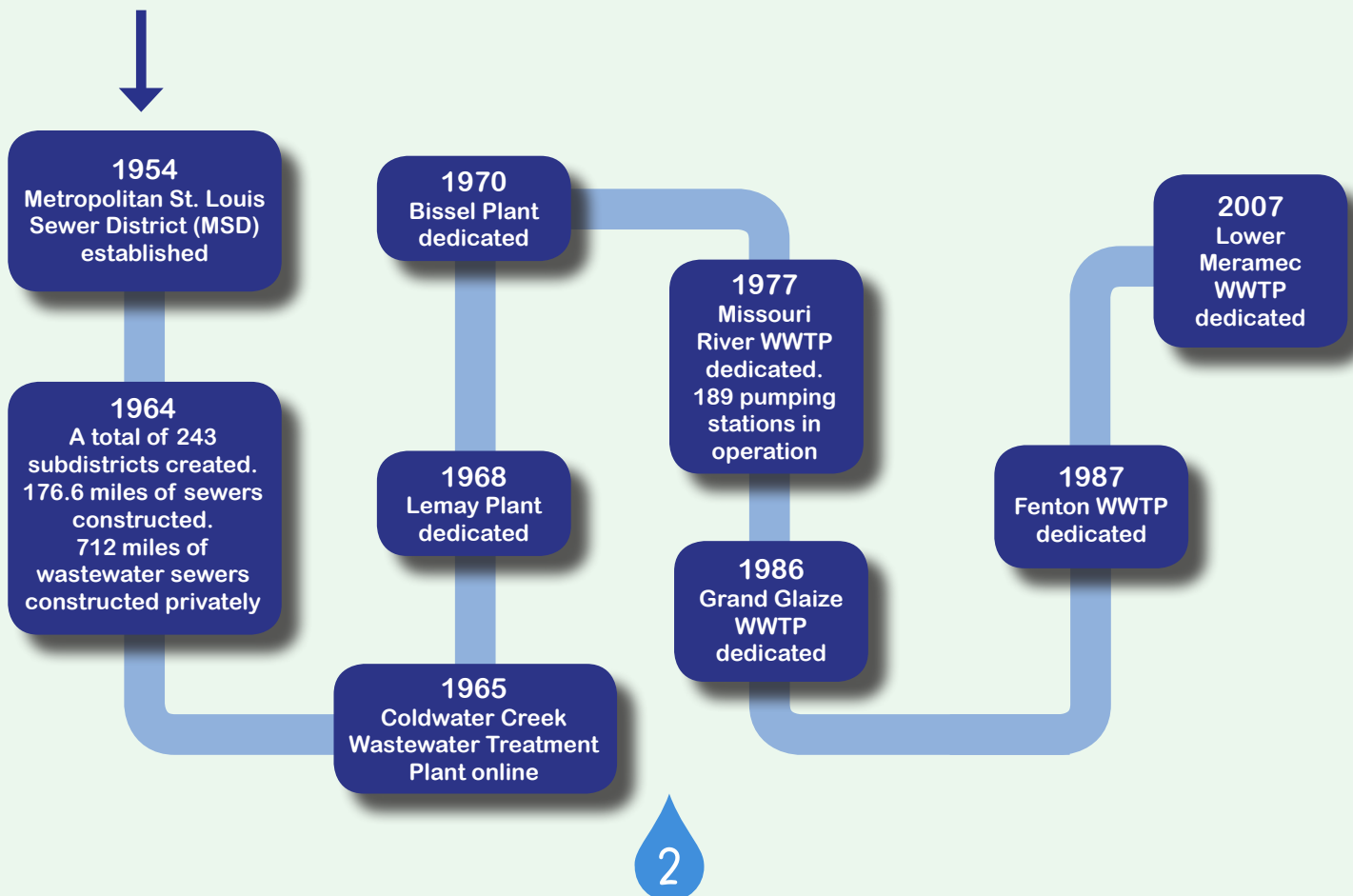
Today, the MSD service area encompasses approximately 520 square miles! The current population served is approximately 1.3 million.

MSD owns and operates the system, which consists of wastewater, stormwater, and combined (stormwater and wastewater) collection sewers, pumping stations, and wastewater treatment facilities.

PUBLICATION GOALS:

1. Serve as a teacher's resource guide
2. Promote awareness of MSD Project Clear's wastewater and stormwater functions
3. Provide insight into STEM career opportunities

HISTORY





Hi, my name is
AQUA CLEAN
and this is my pal
LOU.

Join us on an
adventure through the
MSD as we explore
two utilities working
together as one.



GLOSSARY OF TERMS

Stormwater:

Any water resulting in precipitation that may or may not be mixed with an accumulation of dirt, soil, and other debris or substances collected from the surface on which such precipitation falls or flows.

Wastewater:

Used, dirty water from homes, businesses, and other buildings destined for treatment plants. Water in the combined sewer system becomes wastewater even when a mix of stormwater and wastewater.

Sewer:

A pipe or conduit that carries wastewater or drainage water. Also, referred to as a collection line.

Watershed:

A region or area bounded peripherally by water parting and draining ultimately to a particular watercourse of a body of water.

Combined Sewers:

A sewerage system that carries both wastewater and stormwater runoff. (Typically found in the city)

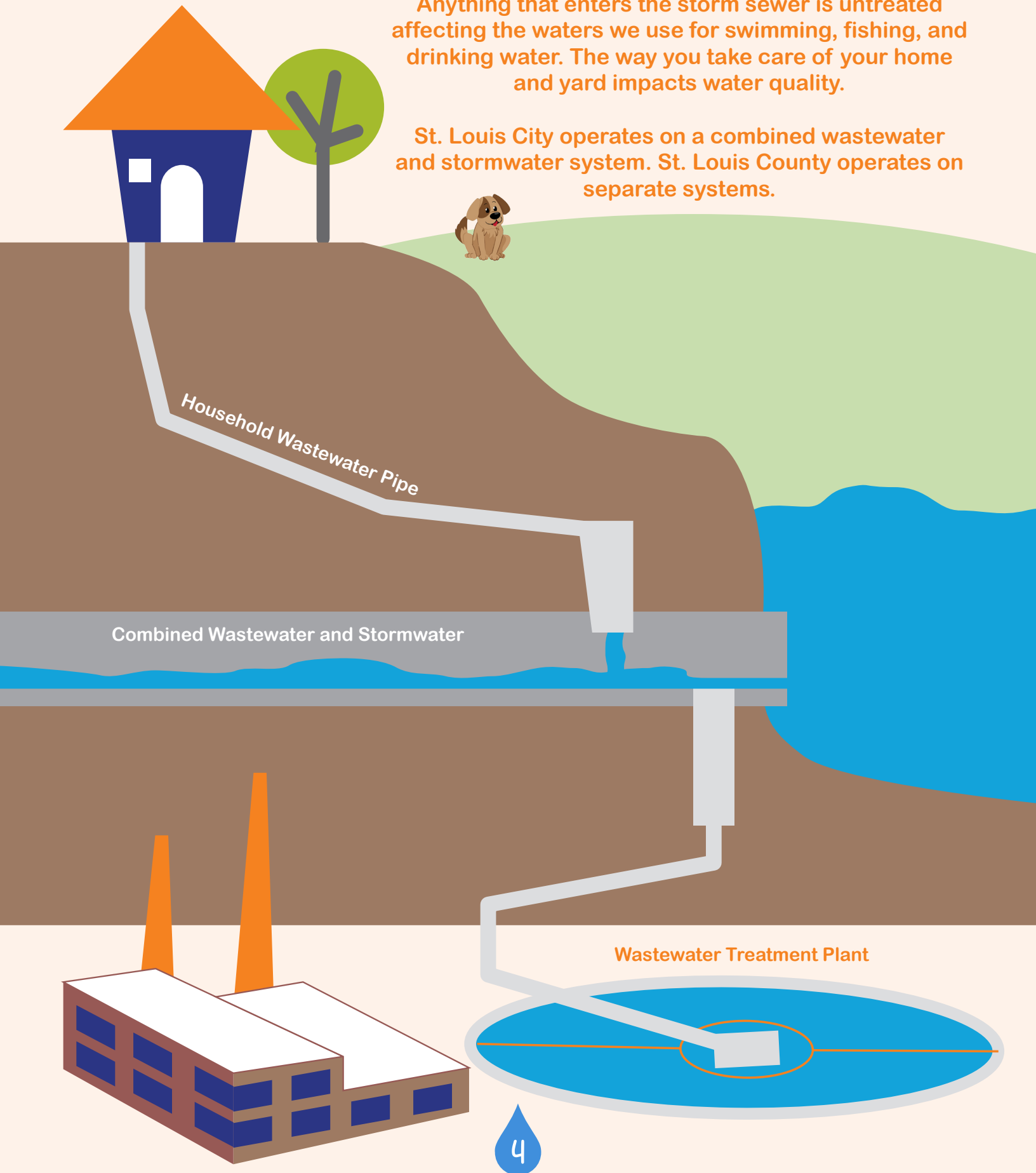
MSD Project Clear:

MSD Project Clear (MSDPC) is two utilities in one--responsible for 7,000+ miles of public wastewater and stormwater sewer systems in the St. Louis region. MSDPC is investing billions of dollars over a generation to improve water quality and minimize wastewater and stormwater issues by monitoring regulatory compliance, planning, designing, and building community rainscaping, system improvements, and an ambitious program of maintenance and repair.

FROM HOME TO PLANT TO RIVER

Anything that enters the storm sewer is untreated affecting the waters we use for swimming, fishing, and drinking water. The way you take care of your home and yard impacts water quality.

St. Louis City operates on a combined wastewater and stormwater system. St. Louis County operates on separate systems.



MSD DEPARTMENTS

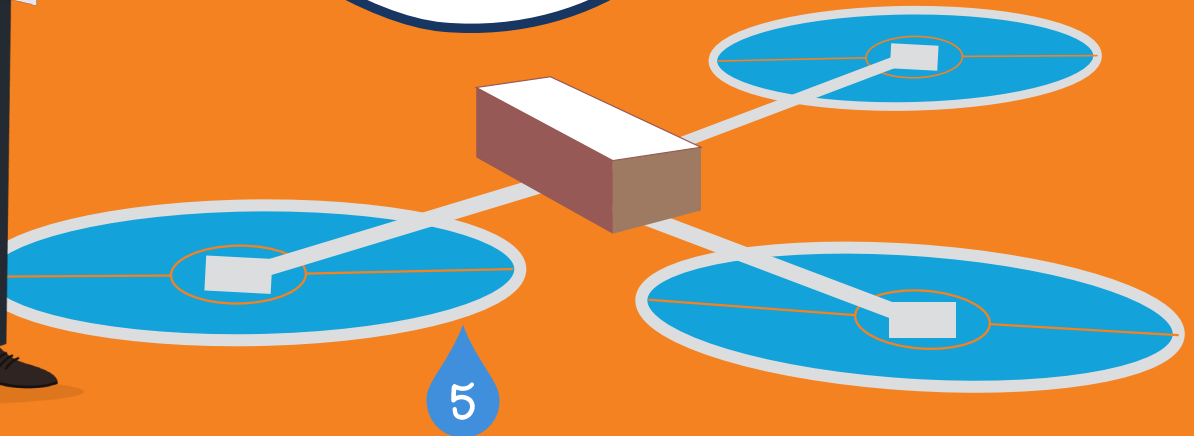
The executive director's team consists of Diversity and Public Affairs staff. This team resolves issues, communicates with the public and ensures that diverse businesses work on our projects.



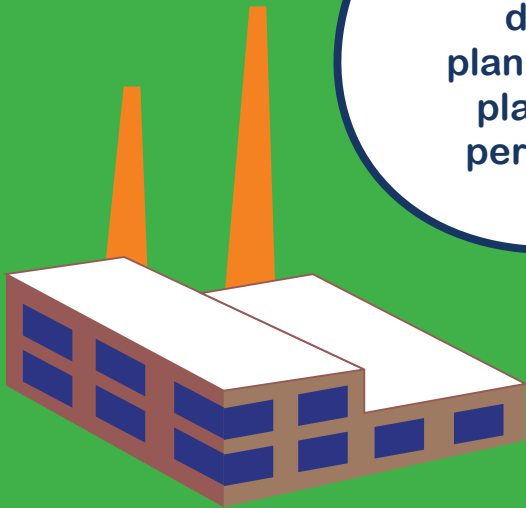
EXECUTIVE DIRECTOR

The operations team is responsible for operating our treatment plants, cleaning the sewers and performs other essential sewer-related functions.

OPERATIONS



ENGINEERING



The engineering team includes inspectors, designers, planners, project planners, and permit issuers.



PROFESSIONAL



Professional staff work in areas such as finance, human resources, legal, information technology, and secretary-treasurer roles.

MSD is the 4th largest sewer system in the United States (behind Los Angeles, New York, and Chicago).

2 UTILITIES IN ONE

MSD performs two functions:



We collect “used” water (the water that goes down the drain when you shower, use the bathroom, or wash your hands), and then clean it up before returning it to the area’s waterways.



We operate and maintain the public storm sewer system, which carries stormwater and surface water runoff. We also help address pollution resulting from stormwater runoff created by rainfall that flows over paved surfaces like your driveway and roof.

TRY THIS:

The next time it rains, watch where the water goes and think about its journey from your yard to the river or lake it will ultimately flow into a body of water.



Teacher's Resource:



MSD WATERSHEDS

We live in the Mississippi River Watershed. A watershed is the land area that water moves across as it flows downhill. Water leaving our homes—anything from washing the car to the stormwater from roofs and driveways—flows downhill and into the streams, creeks and rivers.



ALL ABOUT WATER (H₂O)



All living things need _____ in order to survive?

- Television
- Dirt
- Water
- Ice Cream

List 6 ways you use water at home or school.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

What do you like about water?





wastewater + stormwater

WORD SEARCH

Project Clear
Stormwater
Clean

Know Your Zone
Wastewater
Grease

Utilities
Fats

Sewer
Oil

K N O W Y O U R Z O N E B S B
U X C D W A S T E W A T E R E
G O L C K E Y Y U B L F A T S
R W E P R E M S H C P W W X F
E L A Q P K U T I L I T I E S
A P N W T E A O L S M L X O H
S T O R M W A T E R U O G I G
E L V O H Y N K S E W E R L I
Z P R O J E C T C L E A R M O
A J K Y M G S P C N E T L F G

USE THE WORDS ABOVE TO FILL IN EACH SENTENCE.

1. A _____ is a pipe that carries wastewater or drainage water.
2. _____ is soiled water from homes, businesses, and other buildings destined for treatment plants.
3. _____ is a region bounded by water parting and draining ultimately to a particular body of water.

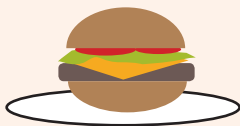
SALT - WINTER DEICING

You know salt is something you put on food. Did you know we use rock salt to help melt the ice during the wintertime? People use the salt to clear streets, driveways and sidewalks to make it easier to drive or walk to a location, like your home or school.

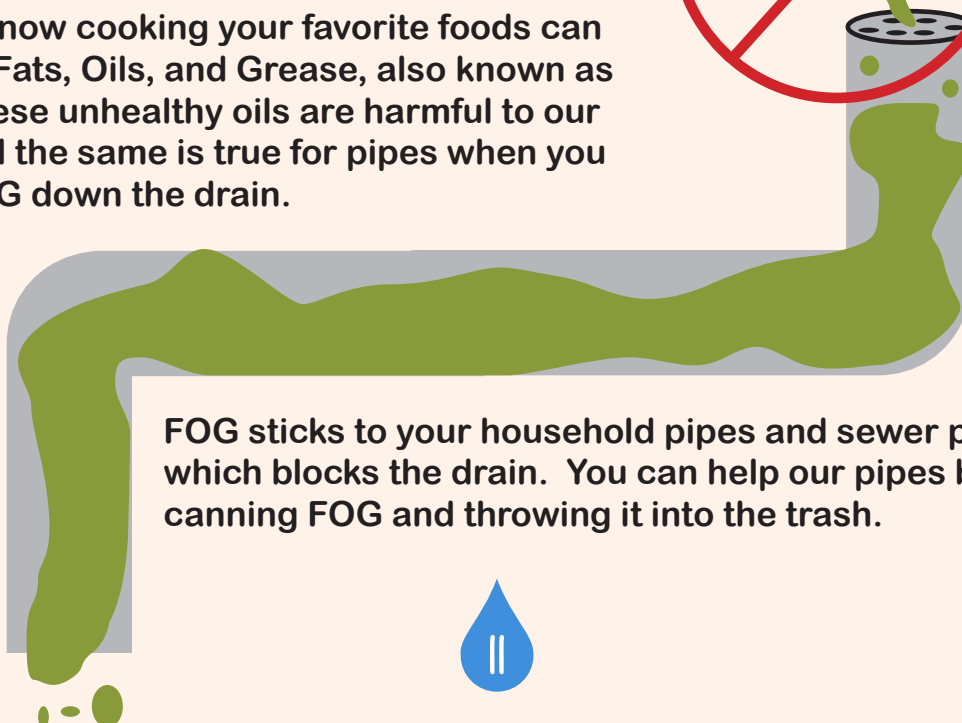


Remember, snow turns into a liquid when it melts and flows into our MSD drains. Too much salt can pollute creeks, rivers, water, fish, and other natural habitats. Always shovel first then apply salt on the ground afterward.

FOG



Did you know cooking your favorite foods can produce Fats, Oils, and Grease, also known as FOG? These unhealthy oils are harmful to our body, and the same is true for pipes when you dump FOG down the drain.

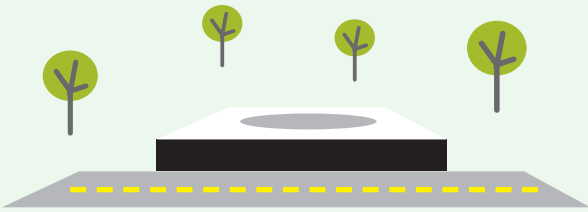


FOG sticks to your household pipes and sewer pipes, which blocks the drain. You can help our pipes by canning FOG and throwing it into the trash.



YARD WASTE

The manner in which you care for your lawn impacts water quality. Here are some simple steps you can take to help us keep our water clean.



Do not wash, sweep or blow yard waste into the storm drain.



Do not dump grass or yard waste onto a creek bank.



Compost your leaves, brush, and grass clippings.

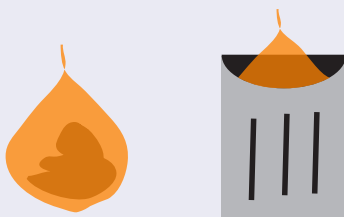
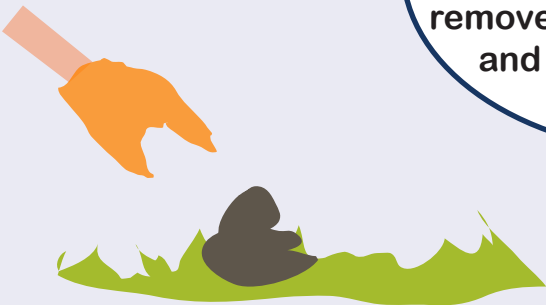


Read and follow labels on yard fertilizers.

PET WASTE

"Scoop it, bag it, trash it."

To prevent water pollution, remove the waste from the bag and flush it down a toilet.



Teacher's Resource:

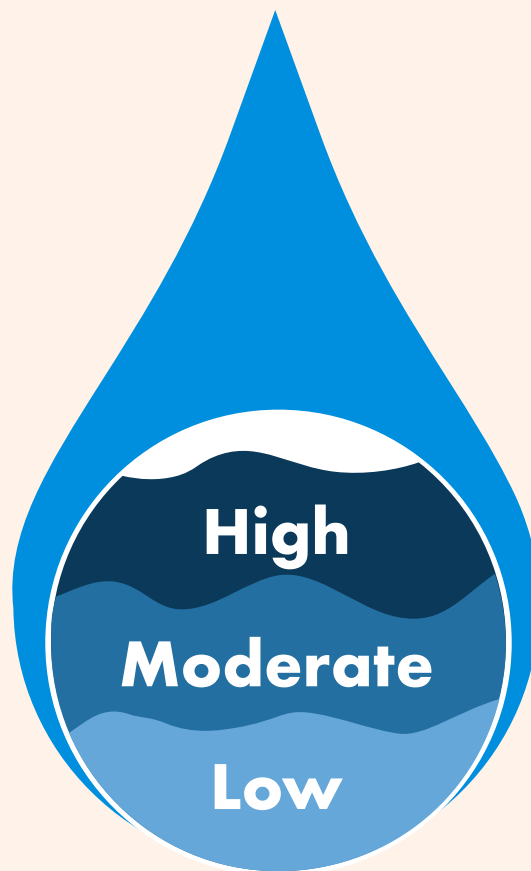


KNOW YOUR ZONE

Flooding can happen anywhere, even if you do not live near water like a lake or stream.

Did you know everyone lives in a flood zone? There are three levels of flood zones. It is important to know if your flood zone is high, moderate, or low.

Everyone should **KNOW YOUR ZONE!**



TRASH BASH

Help protect the environment and learn more about your local watershed by volunteering to remove trash from local rivers and streams.

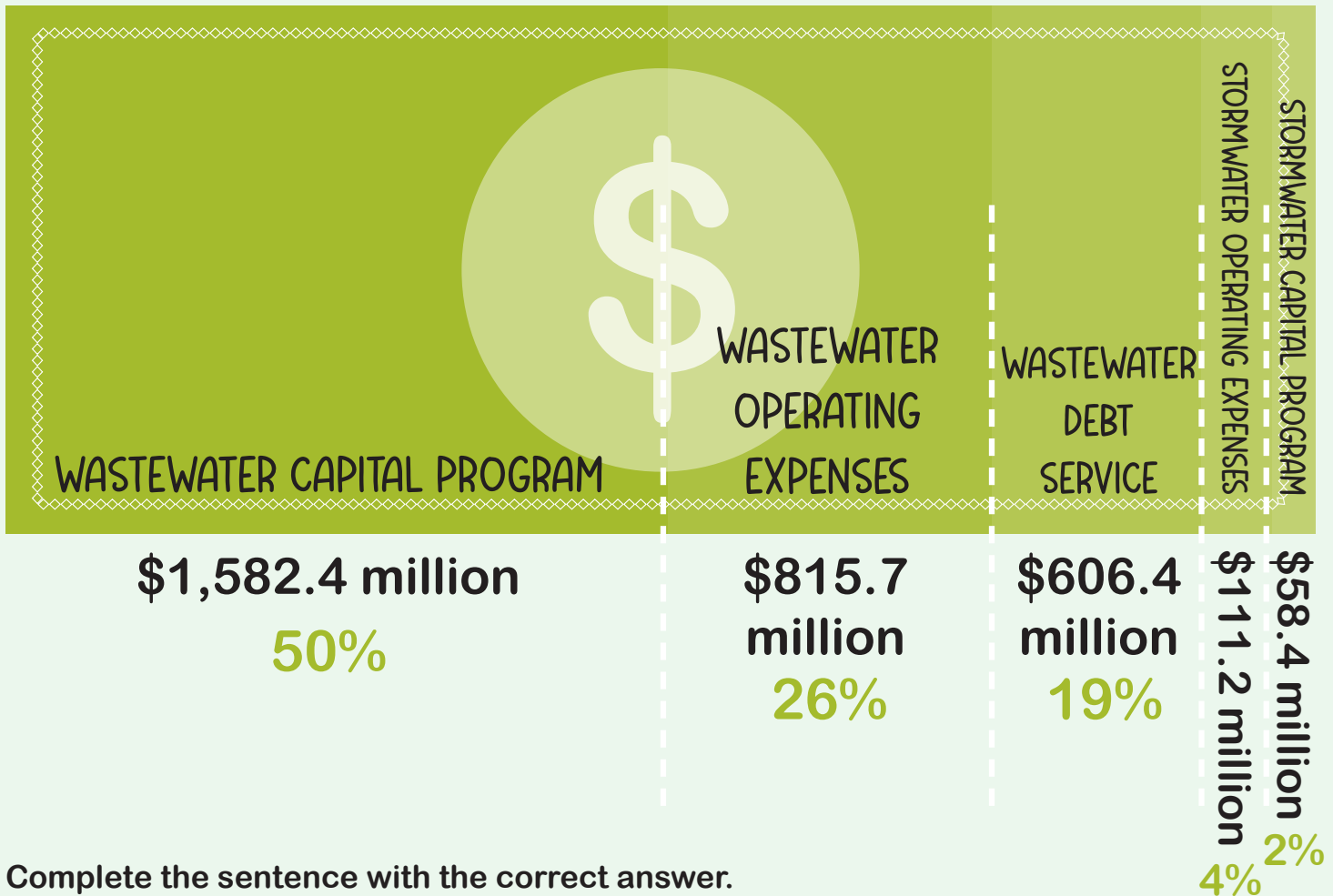
Trash clean-up events are a great opportunity to volunteer to help make the St. Louis community a better place by removing trash in neighborhoods, rivers, and streams. Volunteering is also a great way for scouts to earn badges and students to earn community service hours.



FINANCIAL

MSD has a long-range plan for maintaining and improving its current infrastructure. Here are our current projections for operating, debt service (principal and interest paid on borrowed funds), and capital (construction) program expenditures for Fiscal Years 2021 thru 2024.

FY21 to FY24: (\$3.2 billion)



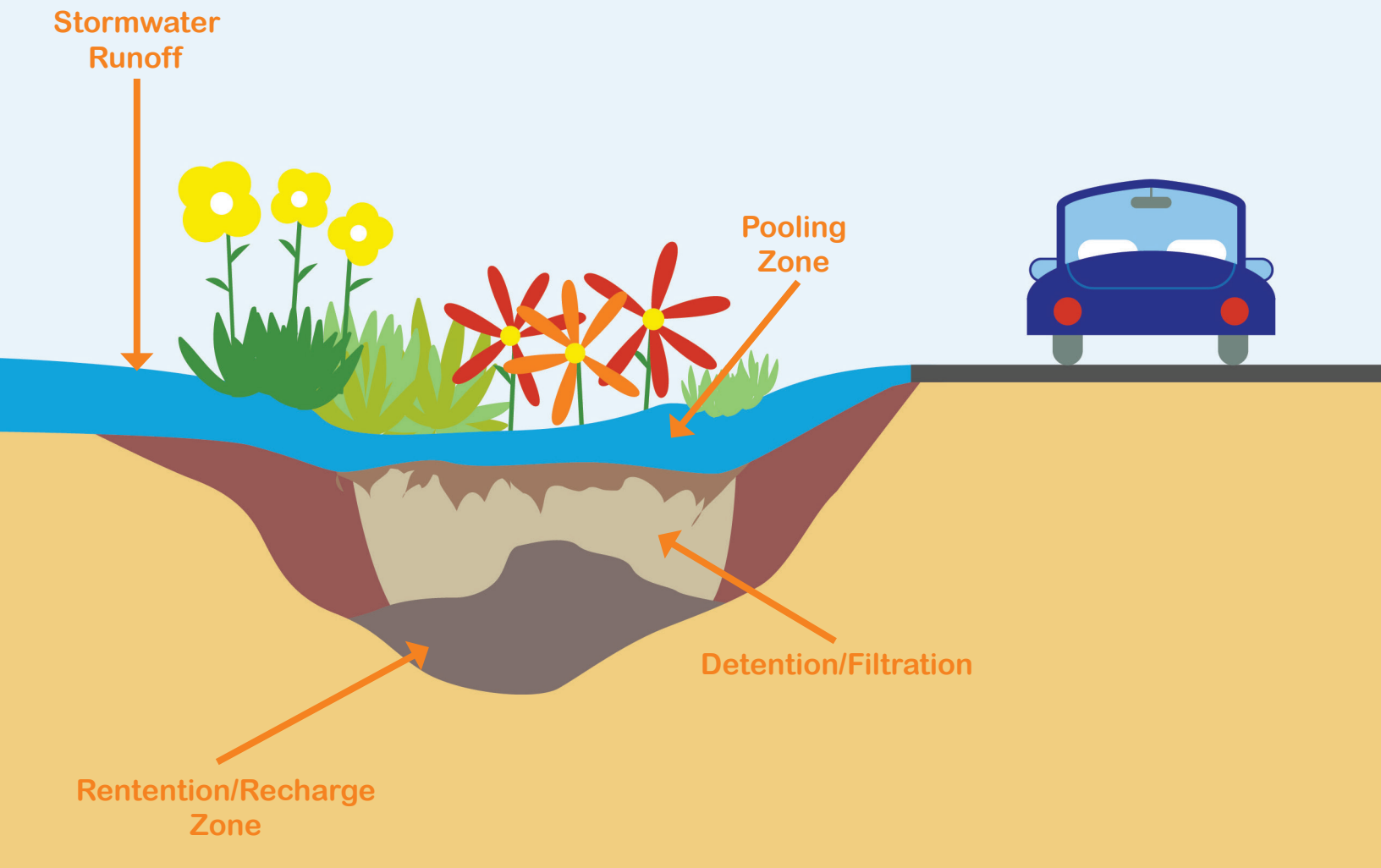
Complete the sentence with the correct answer.

1. Wastewater Capital Program is _____ percent (%) of the total budget.
2. Stormwater Operating Expense represents _____ dollars(\$).
3. Wastewater Operating Expenses is _____ percent (%) of the total budget.
4. Stormwater Capital Program is _____ percent (%) of total budget.
5. Wastewater Debt Service represents _____ dollars of the total budget.

RAINSCAPING

What is a rain garden?

A rain garden is a constructed and landscaped depression designed to catch stormwater from areas such as pavement, rooftops, and compacted green spaces where water cannot be absorbed. The stormwater is captured, filtered, and released slowly to help reduce the amount of water that enters the sewer system during large rainfalls.



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Teacher's
Resource:

