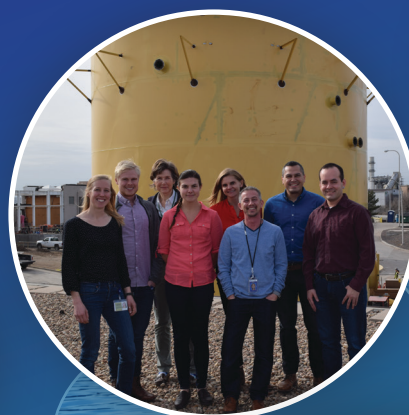


*Living Our*  
**Strategic Vision**



**Metro Wastewater Reclamation District**  
2019 Annual Report

# Table of Contents

Chairman’s Message . . . . . 3

District Manager’s Message . . . . . 3

Customer Service . . . . . 4

Employer of Choice. . . . . 6

Collaboration . . . . . 8

Financial Stability . . . . . 9

What It Takes to Serve 2 Million. . . . . 10

Infrastructure & Operational Excellence . . . . . 12

Culture of Innovation . . . . . 14

Regulatory Engagement & Compliance . . . . . 16

Reflecting Our Vision . . . . . 18



*Left: digester reflected in secondary clarifier at Robert W. Hite Treatment Facility.*

*Middle: treatment facilities and pond at Northern Treatment Plant.*

*Right: harvest at the METROGRO Farm.*

# Executive Messages

## Chairman's Message

### LIVING OUR STRATEGIC VISION

As I end my term as Chairman this year, I wanted to share the exciting progress the Metro District has made on the vision, goals, and strategies set out in the 2016 Strategic Plan. The stories in the following pages demonstrate the organization is living its vision – *to be a responsible leader, an innovative clean water partner, and a great place to work*. From weighing in on state and regional watershed regulations to stretching the value of its infrastructure assets and employee ideas, the Metro District is making the vision real in its work every day.

National and international interest in the Metro District's innovation and operations has exploded during my two years as Chairman, attracting visitors from as far away as Australia. After 13 years of working on this team to protect public health, the South Platte River, and the environment, I am excited as the organization tries new approaches together that result in more sustainable results for Connectors and the watershed.

~ Peter Baertlein, Chairman of the Board

*Chairman Baertlein speaks to employees at the fall Town Hall.*



## District Manager's Message

### ACHIEVING OUR REGIONAL MISSION

The Metro District has never faltered in our mission – *to protect the region's health and environment by cleaning water and recovering resources*. Employee dedication and expertise shaped the 2016 Strategic Plan and are driving successful attainment of its goals.

These goal areas arose from a spirit of stewardship that pervades our culture. This 2019 annual report shows many strides made in each goal area through hard work and good faith. Our employees and Directors take pride in being stewards of the environment, finances, resources, and infrastructure assets. We place tremendous value on the people we work with and serve and are proud to present our 2019 strategic accomplishments.

~ William J. "Mickey" Conway, District Manager



*District Manager Conway speaks to employees at the Service Awards ceremony.*

#### Strategic Goals

Customer Service   Collaboration   Employer of Choice   Financial Stability  
Infrastructure & Operational Excellence   Culture of Innovation  
Regulatory Engagement & Compliance

# Customer Service

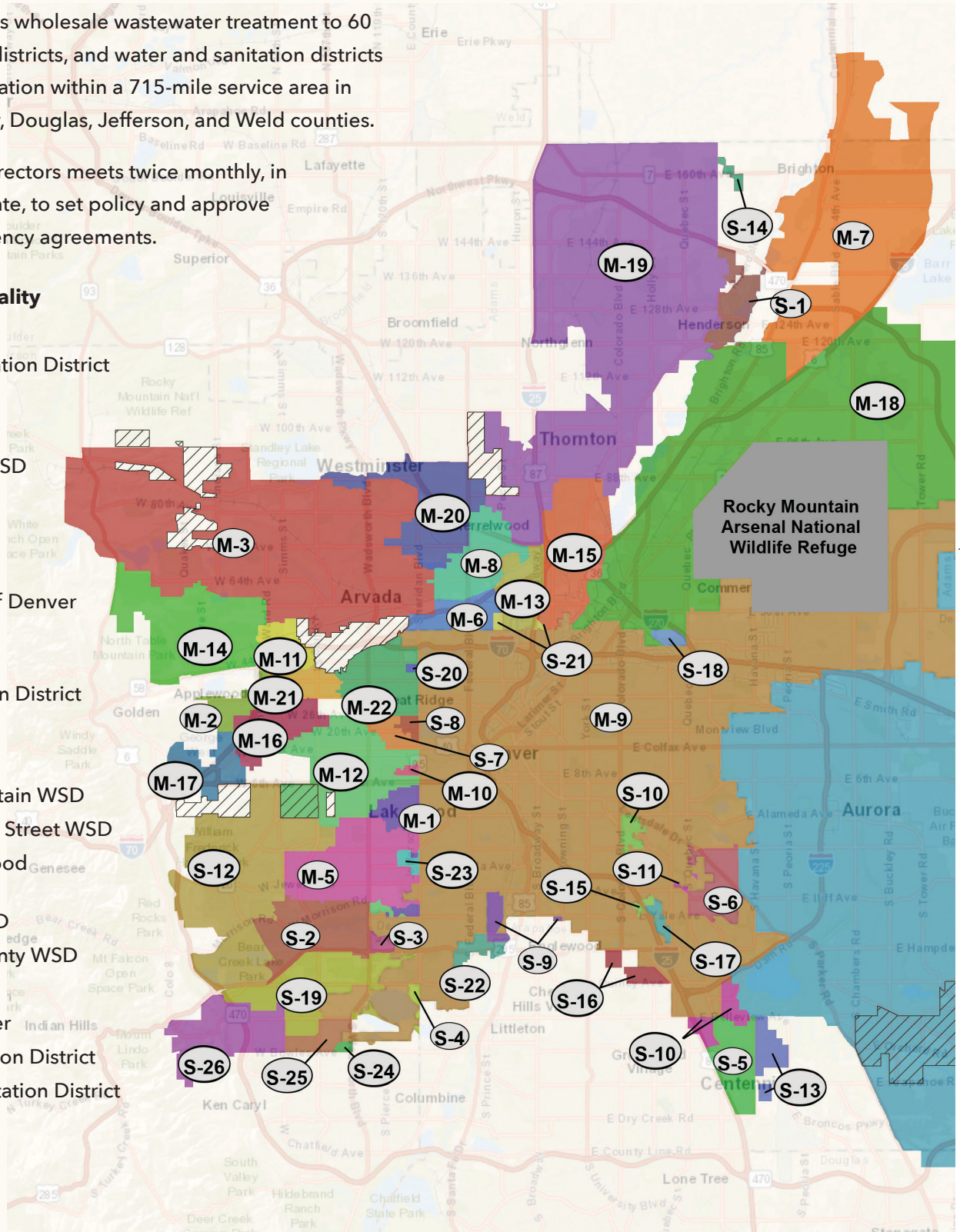
## INTEGRATING CONNECTORS & DIRECTORS

The Metro District provides wholesale wastewater treatment to 60 municipalities, sanitation districts, and water and sanitation districts (WSDs) and to one corporation within a 715-mile service area in Adams, Arapahoe, Denver, Douglas, Jefferson, and Weld counties.

A 38-member Board of Directors meets twice monthly, in committee and in aggregate, to set policy and approve expenditures and interagency agreements.

### Map # Member Municipality

- M-1 Alameda WSD
- M-2 Applewood Sanitation District
- M-3 City of Arvada
- M-4 City of Aurora
- M-5 Bancroft-Clover WSD
- M-6 Berkeley WSD
- M-7 City of Brighton
- M-8 Crestview WSD
- M-9 City and County of Denver
- M-10 East Lakewood Sanitation District
- M-11 Fruitdale Sanitation District
- M-12 City of Lakewood
- M-13 North Pecos WSD
- M-14 North Table Mountain WSD
- M-15 North Washington Street WSD
- M-16 Northwest Lakewood Sanitation District
- M-17 Pleasant View WSD
- M-18 South Adams County WSD
- M-19 City of Thornton
- M-20 City of Westminster
- M-21 Westridge Sanitation District
- M-22 Wheat Ridge Sanitation District



## Connectors to Connectors

Bonvue WSD  
 Cherry Hills North Metropolitan District  
 Cherry Hills Village Sanitation District  
 Clear Creek Valley WSD  
 College Park Sanitation District  
 Daniels WSD  
 Devonshire Heights WSD  
 East Cherry Creek Valley WSD  
 City of Federal Heights  
 City of Golden  
 Mansfield Heights WSD  
 Ralston Valley WSD

## Corporate Connector

Suncor Energy, U.S.A.  
 (acquired Republic Paperboard Company)

## Directors

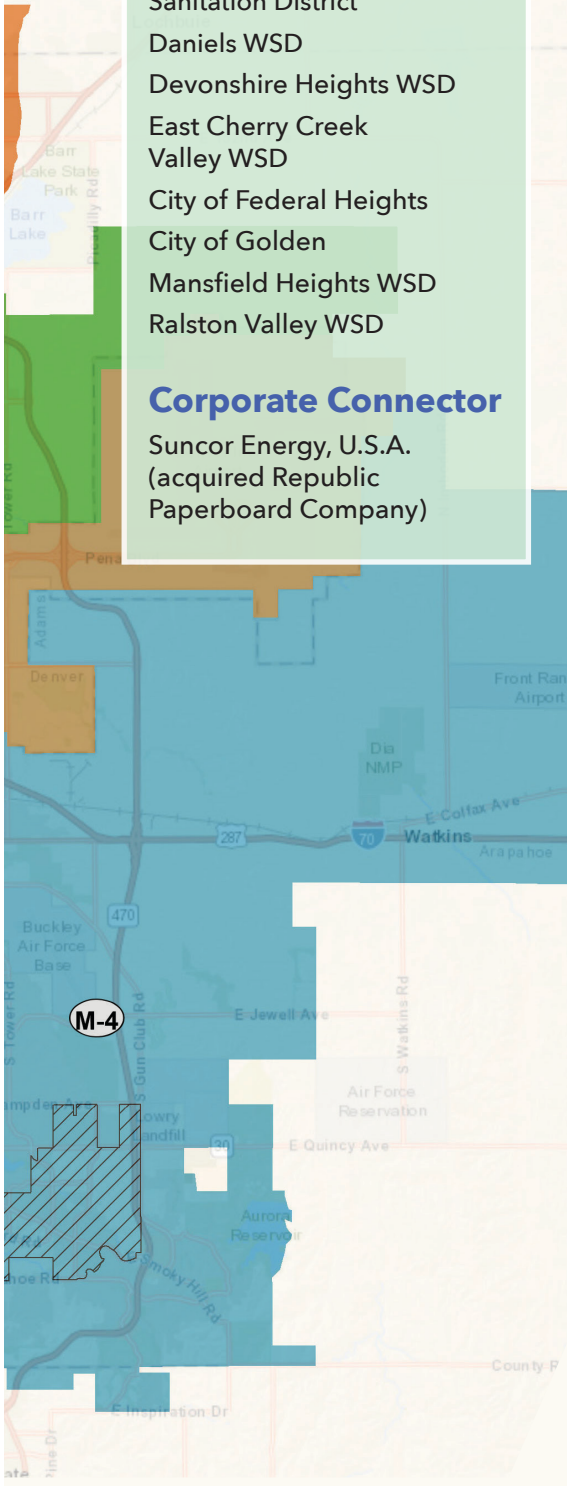
M-1 James McClung\*  
 M-2 Roy Banks\*  
 M-2 Thomas Colchin\*  
 M-2 Steve Pott  
 M-3 Craig Kocian  
 M-3 Bill Ray  
 M-4 Nadine Caldwell  
 M-4 John Dingess  
 M-4 George Dumas\*  
 M-4 Jo Ann Giddings  
 M-4 Bob LeGare  
 M-4 Ingrid Lindemann\*  
 M-4 Daniel Mikesell  
 M-5 Delbert Smith  
 M-6 Philip Cipri  
 M-7 Kim Schoen  
 M-8 Ronald Sanchez  
 M-9 Peter Baertlein  
 M-9 Robert Duncanson  
 M-9 Andrew Johnston  
 M-9 Janet Kieler  
 M-9 Christopher Pacheco  
 M-9 Barbara Puls  
 M-9 Michael Sapp  
 M-9 Peter Spanberger  
 M-9 Mary Beth Susman  
 M-9 Ronald Younger  
 M-10 Richard Lucero\*  
 M-10 Claude Off\*  
 M-11 Martin Majors  
 M-12 Mark Hunter  
 M-12 Gerry Schulte\*  
 M-12 Greg Sekera  
 M-13 Dennis Towndrow  
 M-14 Kathryn Jensen  
 M-15 Amerigo Svaldi  
 M-17 David Councilman  
 M-18 Sarah Niyork  
 M-18 John Ennis\*  
 M-19 Charles Long  
 M-19 Scott Twombly  
 M-20 Stephen Gay  
 M-21 Joan Iler  
 M-22 Philip Burgi

\* Retired

*To provide exceptional customer service through outreach, communication, and cooperation*

## Map # Special Connector

S-1 Adams County (new in 2019)  
 S-2 Bear Creek WSD  
 S-3 Bennett Bear Creek Farm WSD  
 S-4 Bow Mar WSD  
 S-5 Castlewood WSD  
 S-6 Cherry Creek Valley WSD  
 S-7 East Jefferson County Sanitation District  
 S-8 City of Edgewater  
 S-9 City of Englewood  
 S-10 City of Glendale  
 S-11 Goldsmith Gulch Sanitation District  
 S-12 Green Mountain WSD  
 S-13 Havana WSD  
 S-14 Hi-Land Acres WSD  
 S-15 Hi-Lin WSD  
 S-16 Hillcrest WSD  
 S-17 Holly Hills WSD  
 S-18 Industrial Park WSD  
 S-19 Lakehurst WSD (joined with Lochmoor WSD)  
 S-20 Town of Mountain View  
 S-21 North Lincoln WSD  
 S-22 Sheridan Sanitation District #2  
 S-23 South Sheridan Water, Sanitary Sewer, and Storm Drainage District  
 S-24 Southwest Plaza Metropolitan District  
 S-25 Southwest Suburban Denver WSD  
 S-26 Willowbrook WSD



# Employer of Choice

## SPOTLIGHT ON EMPLOYEE EXCELLENCE

The Metro District employs job positions ranging from mechanic to truck driver to scientist. A current focus is on nurturing talent and collaboration through promotion, recognition, teaming, and training.

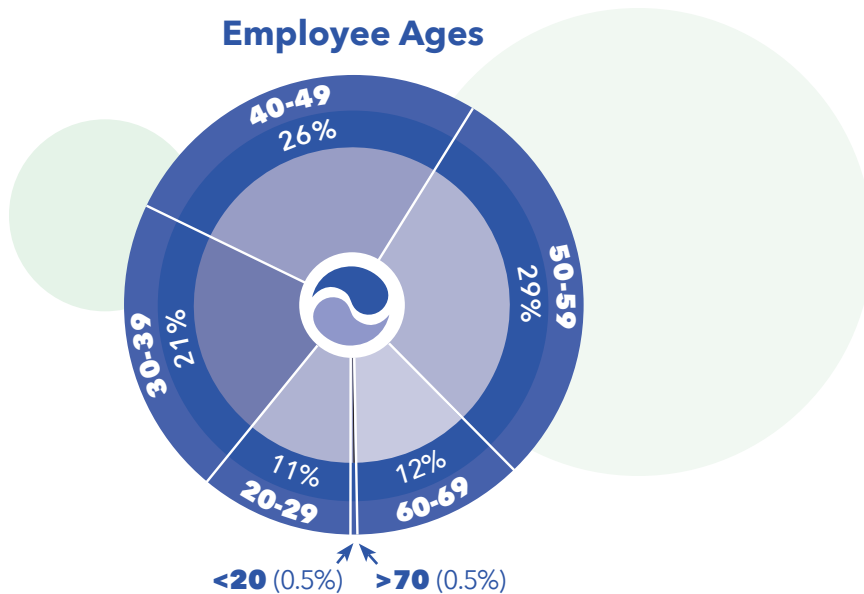
Working shoulder to shoulder daily to clean water and recover resources fosters strong professional and social bonds across age groups.



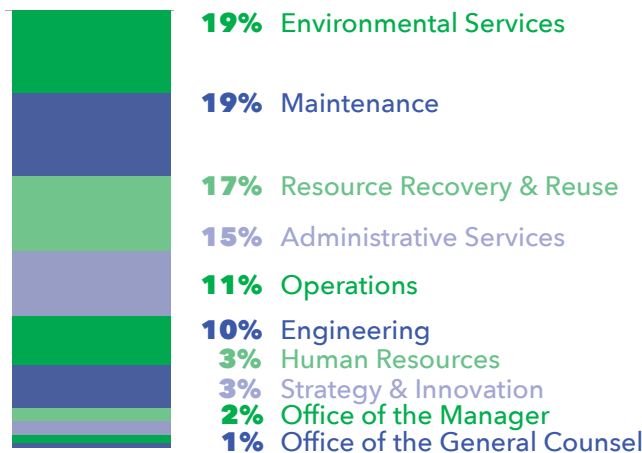
Strategic Value Award and Supervisor Award winners joined District Manager Conway for lunch.

## NURTURING TALENT

### Employee Ages



### Department Breakdown



**411**  
EMPLOYEES END OF 2019

**3**  
ENGINEERING INTERNS

**123**  
NEW HIRES, PROMOTIONS,  
AND ADVANCEMENTS

**163**  
EMPLOYEES RECOGNIZED  
IN 4 MONTHS OF  
NEW PROGRAM

**406**  
EMPLOYEES TRAINED  
IN 7 HABITS OF HIGHLY  
EFFECTIVE PEOPLE

**1,568**  
TECHNICAL TRAINING  
CLASSES COMPLETED

*To attract and retain an effective, motivated, and high quality workforce*



*Top to bottom:*

*Employee recognition at the fall Town Hall.*

*Electrical engineers at the Robert W. Hite Treatment Facility.*

*Resource Recovery and Reuse team members at the METROGRO Farm.*

*Northern Treatment Plant team members at end of the 1st Cleanup Challenge.*

*Strategy and Communication team hosting a Bike to Work breakfast station.*

# Collaboration

## EXPANDING OUTREACH & PARTNERSHIPS

One core concept in the Strategic Plan is for the Metro District to expand involvement in regional conversations pertaining to water and the environment – in essence, to get out there more.

In 2019, the District Manager and employees engaged in meaningful outreach and partnerships with connectors, government leaders including legislators and regulators, other regional stakeholders, and representatives of the public and media. Facility tours by public, industry, and governmental stakeholders were conducted every month of the year.

Some of the year's highlights are summarized below.

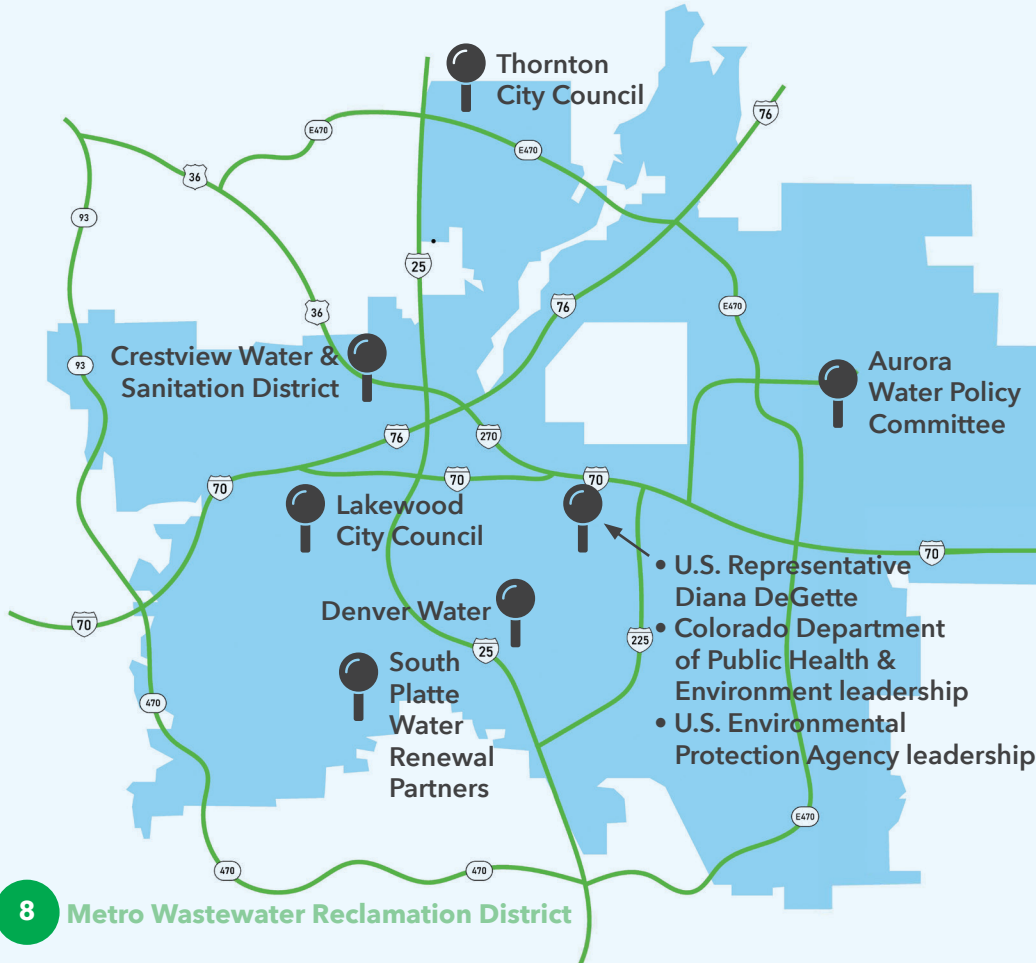
*To promote internal and external collaboration to achieve shared goals*

**44**  
OUTREACH  
EVENTS

**4**  
QUARTERLY  
NEWSLETTERS

**10**  
MEDIA PUBLICATIONS,  
INTERVIEWS, FACT SHEETS

### Government Leadership Outreach Highlights



*Colorado Surfing Association members visiting the Robert W. Hite Treatment Facility in March.*



### Government Leadership Facility Tours

- Representative Adrienne Benevidez
- Senator John Cooke
- Senator Chris Hansen
- Senator Dominick Moreno
- Energy Legislation Review Interim Study Committee
- Water Resources Review Committee

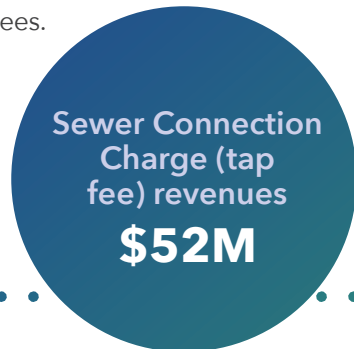
# Financial Stability

## TAKING THE LONG VIEW

### 2019 Year-End Summary

Taking the long view of our role in the region, the Metro District has devised methods and practices to maintain financial stability. These include rigorous accounting and reporting processes. They also include annual budget approval by the Board of Directors based on 10-year cash flow projections and recommendations by employees.

Financial stability is evident in detail in the latest Comprehensive Annual Financial Report, available on the website. Year-end operating expenses and revenues are rounded off and color-coded by category below.



### Total Expenses \$151M

Total Operating Expenses \$130M

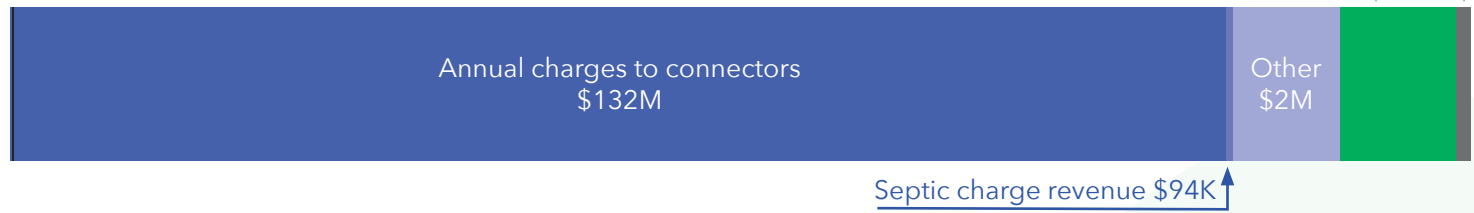
Total Non-Operating Expenses \$21M



### Total Revenues \$148M

Total Operating Revenues \$134M

Intergovernmental revenue \$2M  
Investment revenue \$11M ↓



### Bond Refunding

In 2019, the Metro District's long-term finances benefited from a partial refunding of the 2009B Bonds and an advanced refunding of the 2012A Bonds. Both bond series were issued to fund capital construction projects, including the Northern Treatment Plant.

This process affirmed the Metro District maintains excellent credit ratings with Standard and Poor's (AAA) and Moody's (Aa1). These two refundings are saving more than \$20 million over the next 12 years.

*To maximize value  
to our ratepayers  
through stewardship  
of financial resources*

# What It Takes to Serve 2 Million

**715**  
SQUARE MILE  
SERVICE AREA

**61**  
CONNECTORS



## REGULATIONS OF NOTE



### Nitrogen

2018: 15 mg/L TIN  
2037: 2.01 mg/L TN  
(anticipated)



### Phosphorus

2018: 1.0 mg/L TP  
2037: 0.10 mg/L TP  
(anticipated)



### Temperature

2018: Monitoring  
2031: 12.1°C December through February  
24.2°C July through October  
Monitoring remaining months

**10** Metro Wastewater Reclamation District



## Population

2018: 2 million



## Flows average combined

2019: 137 mgd



## Loads average combined

2019: 329,669 ppd BOD

**A**

### Robert W. Hite Treatment Facility

- Acres: 194 acres
- Plant commissioned: 1967
- Average daily flow: 123.3 mgd
- Rated capacity: 220 mgd
- Type of treatment: Preliminary, Primary, Secondary, Solids Handling, Disinfection, Energy Recovery

**B**

### Northern Treatment Plant

- Acres: 90 acres
- Plant commissioned: 2016
- Average daily flow: 4.85 mgd
- Rated capacity: 28.8 mgd
- Type of treatment: Preliminary, Primary, Secondary, Tertiary, Solids Handling, Disinfection, Energy Recovery

**C**

### Transmission System

- Metro District-owned interceptors: 236 miles
- Diameter range of interceptors: 3 inches - 90 inches
- Manholes: 3,728
- Lift stations: 3
- Other structures:
  - 113 diversion structures
  - 109 metering facilities
  - 30 siphon structures

**D**

### METROGRO Farm

- Acres: 52,000
- Purchased: 1993-2000
- Biosolids application rate: 1-1.4 dry tons/acre\*
- Biosolids land applied each year: 8,995 dry tons/year\*
- Acres applied: 7,089 acres/year\*
- Type of operation: Dryland farming and livestock grazing

\* 5-year average

**D**

### METROGRO Farm 60 miles east of Denver in Arapahoe and Elbert counties

#### Legend

- Service Area Boundary
- Transmission System
- ▲ Lift Station

#### Acronyms

- BOD = biochemical oxygen demand
- mgd = million gallons per day
- ppd = pounds per day
- TIN = total inorganic nitrogen
- TN = total nitrogen
- TP = total phosphorus

Source: 2018 Facility Plan (with updated data)

# Infrastructure & Operational Excellence

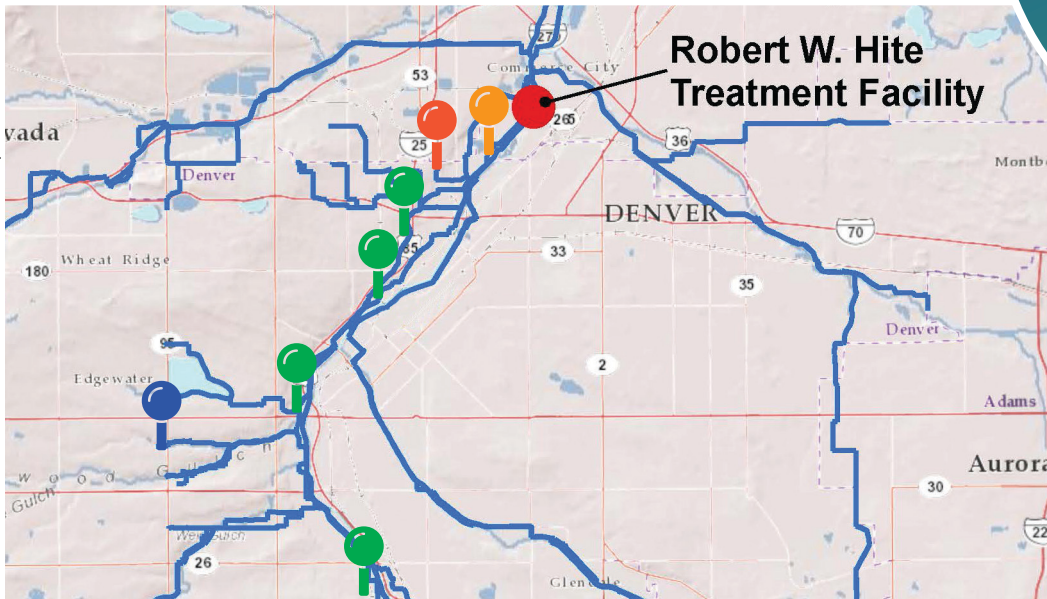
## STRETCHING THE VALUE OF CAPITAL INVESTMENTS

### Interceptor Rehabilitation

The Metro District continually invests in maintaining the Transmission System assets for capacity, performance, and reliability. The current interceptor rehabilitation project was designed, bid, and initiated in 2019 and will be completed in mid-2020.

Segments under rehabilitation total 14,319 linear feet and are depicted on the map below. A regular schedule of rehabilitation using materials such as sliplining and cured in place pipe (CIPP) extends interceptor life and maintains performance.

*To deliver value through employee involvement, process optimization, and asset stewardship*



Excerpt from Transmission System map showing interceptors as blue lines.

### Interceptors Rehabilitated

- Central Denver  
4 segments, sliplined
- Globeville  
4 segments, CIPP
- Platte River  
4 locations, 28 total segments, 21 CIPP, 7 sliplined
- Lakewood Gulch Common  
2 segments, CIPP

Capital assets owned at year-end  
**\$1.19B**

Net investment in capital assets during 2019  
**\$649M**

## Other Infrastructure Projects

Dozens of infrastructure projects were underway in 2019, in each of the capital expenditure categories in the bar below. Eight construction projects were active on the 194-acre Robert W. Hite Treatment Facility, including three major projects described in the 2018 Annual Report: Digester Complex Rehabilitation, Nuisance Struvite and Dewaterability Improvements, and South Headworks Improvements.

Projects completed in 2019 provide a snapshot of how infrastructure and operational excellence obtains the most value from our capital investments by reusing resources and devising cost effective and sustainable strategies.

### METROGRO Farm Grain Bins

The METROGRO® Class B biosolids product is beneficially reused as a fertilizer to grow crops on the METROGRO Farm.

Six new steel bins providing an additional 360,000 bushels of permanent grain storage will meet current crop yields and result in additional revenue.



Top of new steel grain bins.



South Secondary electrical switchgear.

### Electric Substation Study

This study confirmed the feasibility of constructing a transmission-level electrical service substation on the Robert W. Hite Treatment Facility site.

The resulting “transmission” configuration would provide a more reliable power supply, provide for future capacity, maximize the benefit of cogeneration, and reduce annual costs of electrical power.

### Plant Water Chlorinated System Improvements

The Plant Water Chlorinated (PWC) system and other nonpotable water distribution and chemical feed systems were upsized and improved.

The PWC system reuses treated, disinfected water at 40 different onsite locations for nonpotable demands such as irrigation, saving water costs at the Robert W. Hite Treatment Facility.



PWC line trench west of Main Street.

## Total Appropriations for 19 Largest Capital Projects \$358M



# Culture of Innovation

## COST SAVING APPROACHES & TECHNOLOGY

Employees take to heart the Metro District's environmental and fiscal stewardship and for many years have fostered a culture of innovation and continuous improvement.

The projects and areas of exploration summarized on these pages reflect technical areas of inquiry to achieve regulatory requirements, protect the environment, and realize long-term cost savings.

### Energy Management

An Energy Management framework is guiding capital investments and operational decision making to meet goals pertaining to energy efficiency, use and production, and greenhouse gas reduction.

#### FA-1 Energy Efficiency

Real-time energy monitoring dashboards are being used at the Robert W. Hite Treatment Facility to reduce electrical costs.

#### FA-2 Existing Asset Utilization

Wind energy at the METROGRO Farm and solar energy at the Northern Treatment Plant are under evaluation. Using these assets for such purposes would allow for battery energy storage for more cost control strategies.

#### FA-3 Thermal Energy

A heat recovery system for the Delgany Interceptor system replacement is under design to provide heat for buildings at the new National Western Center.

#### FA-4 Biogas Utilization

The use of biogas by-products from the digestion system for renewable natural gas is under exploration.

## IDEAS AT WORK

The Ideas at Work program, established 31 years ago, rewards employees for identifying better ways to tackle the daily tasks at a regional wastewater utility.

In 2019, 21 employees received monetary rewards for ideas that save time and money or promote safe and efficient working conditions.



*The Delgany Interceptor system replacement will be constructed underground, to allow public access to the South Platte River.*

Advances were made in all six  
**Energy Management Focus Areas (FAs)**



*To inspire infinite ideas that extend the value of finite resources*

## 2019 Pilots, Demonstration, and Construction

Process innovations at the Metro District have garnered international attention, with technical and lay groups touring the facilities in 2019.

The Robert W. Hite Treatment Facility, sited in 1962, is landlocked on all sides, as shown below. Making the most of this facility drives efforts toward process intensification, compact equipment, and portfolio approaches for meeting water quality standards.



### **A In-Stream Temperature Habitat Improvements**

Aquatic life habitat enhancements and features that mix the South Platte River with cooler Clear Creek flows were constructed to meet winter temperature standards in the river downstream.

### **B Peracetic Acid Full-Scale Demonstration**

The Peracetic Acid (PAA) full-scale demonstration completed in 2019 followed a successful pilot. PAA demonstrated advantages over the previous sodium hypochlorite disinfection system.

### **C North Secondary Optimization**

A paired aeration basin and secondary clarifier (AB2/SC2) are dedicated to full-scale pilot testing of new technologies to improve the capacity, performance, and efficiency of the North Secondary Complex.

Hydrocyclones tested in AB2 improved solids settling by approximately 50 percent compared to conventional treatment. The equivalent of putting a turbocharger on a car engine, hydrocyclones allow for a more compact, intense process.

### **D AirPrex® Phosphorus Recovery Reactor Construction**

The AirPrex® phosphorus recovery reactor being constructed northeast of the Solids Complex will capture phosphorus to prevent negative downstream impacts and recover a valuable fertilizer product. Starting up in 2020, the reactor is a key feature of the Nuisance Struvite and Dewaterability Improvements project.

*Robert W. Hite Treatment Facility.*



# Regulatory Engagement & Compliance

## STEWARD ADVOCATES

As stewards of the South Platte River, the Metro District works closely with regulators, legislators, and other stakeholders in the development of policies and standards to protect water quality and the environment.

Employees engaged in more than 100 meetings with regulators and other stakeholders on two fronts in 2019: (1) application of existing regulations and (2) proposed changes or new regulations.

*To meet or exceed regulatory requirements through advocacy and collaborative relationships*

## Existing Regulations

### Title V Air Quality Permit Renewal

The Robert W. Hite Treatment Facility air quality permit was renewed and allows continued operation of the combined heat and power system with no new requirements.



*Combustion turbines for combined heat and power system.*



*Employees took wastewater samples onsite at 47 industries.*

### Local Limits Sampling Protocols

Site-specific protocols for sampling wastewater were developed for industries and residential areas in support of the technical local limits evaluation. The evaluation resulted in changes to the Rules and Regulations to protect the plants.

### PAA Disinfection Infrastructure Permit Modification

Site application amendment and process design reports were submitted to the Colorado Department of Public Health and Environment to amend the Regulation 22 application for permanent regulatory approval of the PAA infrastructure. A discharge permit modification to include PAA also was requested.



*PAA tanks on the Robert W. Hite Treatment Facility.*



## Proposed and New Regulations



*Barr Lake, which has water quality limits for phosphorus.*

### TENORM Stakeholder Input

Senate Bill 18-245 required the Colorado Department of Public Health and Environment to hold a stakeholder process and develop a report on Technologically Enhanced Naturally Occurring Radioactive Material (TENORM), as a precursor to a rulemaking process. Employees participated in the process and provided data and other input for the report.



*Outfalls at the Northern Treatment Plant.*

### OCCT Partnerships

The Metro District partnered with regional stakeholders and challenged a Colorado Department of Public Health and Environment order requiring Denver Water to use large volumes of a phosphorus-based chemical as its Optimal Corrosion Control Treatment (OCCT) to mitigate lead in its drinking water. A fact sheet is available on our website.

In December 2019, the U.S. Environmental Protection Agency granted Denver Water's request for a variance from the order, avoiding adding orthophosphate to the drinking water supply, and approved its proposed alternative Lead Reduction Program.



*Airprex® reactor under construction at the Robert W. Hite Treatment Facility.*

### Regulation 22 Stakeholder Input

*Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works*

Employees provided input to update regulations governing the design and construction of infrastructure for publicly owned treatment works in Colorado.

### Regulation 61 Stakeholder Input

*Colorado Discharge Permit System Regulations*

Employees provided input regarding changes that would allow for flexibility and quicker turnaround time for permitting. Updates clarified water quality targets to be used for site approvals and design flow definitions to account for reused water.



# Reflecting Our Vision

## AWARDS AND HONORS

The 2019 Annual Report is designed to reflect the many ways the Metro District is meeting our Strategic Plan goals, objectives, tactics, and strategies. The awards and honors received by our organization, teams, and individuals in 2019 also reflect that we are living our strategic vision in the work we do every day, 365/24/7.



*South Platte River aquatic life habitat improvements site.*

*To be a responsible leader, an innovative clean water partner, and a great place to work*

### Walter A. Meers Award

Rocky Mountain Water and Environment Association and Rocky Mountain Section of the American Water Works Association

#### Edyta Stec-Uddin



### Certificate of Excellence in Financial Reporting 32nd consecutive year

Government Finance Officers Association of the United States and Canada

### Laboratory Analyst Excellence Award

Water Environment Federation

#### Liz Werth



### Ops Challenge 1st in Division

Water Environment Federation

#### Elevated Ops



### Health Links™ Certified Healthy Workplace Leader

Center for Health, Work & Environment Colorado School of Public Health

### Cigna Well-Being Award®

Cigna

### Chairman's Award

Metro District Board of Directors

#### Blair Wisdom



### Peak Performance Gold Award for the Northern Treatment Plant 2018

National Association of Clean Water Agencies

### Peak Performance Silver Award for the Robert W. Hite Treatment Facility 2018

National Association of Clean Water Agencies

### Ops Challenge 2nd in Division

Water Environment Federation

#### Double Duty



### Workplace Health Achievement Index Silver Level

American Heart Association

### Ralph Fuhrman Medal

Water Environment Federation



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