Madison Metropolitan Sewerage District

## Nine Springs Wastewater Treatment Plant

# Capital Project Infrastructure Placement Plan

**July 2023**

Madison Metropolitan Sewerage District

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# Capital Project Infrastructure Placement Plan

**MMSD Project No.2205638 (CIPD04)**

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# Executive Summary

| CPIPP | TITLE | DESCRIPTION | PLACEMENT CONSIDERATIONS | COST |
|---|---|---|---|---|
| 1.0 | **ELECTRICAL SERVICE UPGRADE AND BACKUP GENERATORS** | Replaces the outdoor service switchgear, transformers, busway system and indoor distribution switchgear for the incoming electrical service to the treatment plant and adds backup generators. | • Located between the Effluent Building and MG&E Nine Springs Substation.<br>• Keep substation access outside of primary controlled Plant perimeter fencing. | $4.7M (2023 CIP) - $12.1M (2024 CIP) |
| 2.0 | **BIOSOLIDS IMPROVEMENTS** | | | |
| 2.1 | **METROGRO LOAD-OUT IMPROVEMENTS** | Upgrades to the load-out facility. | • Expand at the existing load-out station location near the Metrogro Storage Tanks.<br>• Abandon load-out use at Vehicle Loading Building.<br>• Relocate Odor Control Soil Beds.<br>• Realign service roads 'A' and 'AB' to accommodate Metrogro hauling traffic.<br>• Metrogro haulers use Gate 1 for entry and exit.<br>• Establish a secondary perimeter of security to allow Metrogro haulers unimpeded access during operating hours. | $5.7M |
| 2.2 | **METROGRO STORAGE AND MAINTENANCE FACILITY** | Relocate Metrogro operations from Vehicle Loading Building and consolidate Metrogro fleet storage and maintenance in one facility. Co-locate Fleet maintenance (Maintenance Shop No. 2) with Metrogro maintenance. | OPTION A<br>• Located to the north of the Maintenance Facility Building.<br>• Utilizes slope for a potential 2-story structure.<br>• Fleet maintenance on the south side of the building shares the service road with the Maintenance Facility Building.<br>• Shared fueling station with Maintenance Facility Building.<br>• Metrogro equipment accesses the facility on the north side and is adjacent to the load-out stations and Pump Station.<br>• Offices located within the building provide direct observation of the load-out stations.<br>OPTION B<br>• Located to the west of the Maintenance Facility Building and south of the Metrogro Storage Tanks.<br>• Extension of the service road to the west is required.<br>• Fleet maintenance occurs on the south side of the facility adjacent to Fleet storage in the Maintenance Facility Building.<br>• Service road 'AC' is reconfigured to accommodate new facility.<br>• Additional Metrogro fleet storage space is available to the west.<br>FUTURE CONSIDERATIONS<br>• Future Biosolids expansion reserved for 5-10 acres to the west of current storage tanks. | Either Option: $12.7M - $14M |

| CPIPP TITLE | | DESCRIPTION | PLACEMENT CONSIDERATIONS | COST |
|---|---|---|---|---|
| **3.0** | **SEPTAGE RECEIVING IMPROVEMENTS** | Construct a new stand-alone Septage Receiving facility separate from the Headworks building to include up to four (4) volume metered, drive-through unloading stations. | OPTION A<br>• Situated between the Headworks building and Metrogro storage tanks.<br>• Shares access with Metrogro Haulers via Gate 1.<br>• Reconfigure roadways to allow for drive-through unloading.<br>OPTION B<br>• Situated to the east of the Maintenance Facility Building.<br>• Haulers enter the Plant through an improved Gate 3 on Moorland Road and immediately turn right into the Septage Receiving Facility. Haulers can drive through and either exit via Gate 3 or exit via a dedicated exit on Moorland Road. | Either Option: $4.0M - $5.0M |
| **4.0** | **HEAT AND POWER IMPROVEMENTS** | Potential power improvements include either cogeneration or biogas pipeline injection. A determination on the best path forward for the District requires additional study. This plan provides infrastructure placement considerations for both options. | • Program not defined due to additional study needed.<br>• Cogeneration may need 6,600 SF or the equivalent of the current Gas Skid and Sludge Control Building No. 2 footprint (120’ x 55’).<br>• Biogas injection program to-be-determined.<br>• Cogeneration improvements should be located near existing power generation facilities (Sludge control and Boiler buildings) and in conjunction with heat loop improvements.<br>• Biogas injection infrastructure does not have identified placement constraints. Based on existing treatment plant infrastructure, preferred locations are either on the east side of plant near solids processing or to the south of the MG&E (Madison Gas and Electric) substation.<br>• Biogas injection will require a gas pipeline connection to utility provider services. | $50,910,000 (per 2023 CIP) |
| **5.0** | **LIQUID PROCESSING PHASE 2** | Delivery and treatment (low DO). Replacing existing east and west blowers, and electrical switchgears. There may be a need to expand the West Blower Building to accommodate new blower equipment. | • Potential expansion has not been studied for size requirements or determination of need.<br>• Reserve space directly adjacent to West Blower Building for expansion. | $43,900,000 (per CIP 2024)<br>• EPIC-$1.3M<br>• Low DO Partial Plant-$3.6M<br>• Low DO Full Plant-$19M<br>• West Blowers & SG - $10M<br>• East Blowers & SG - $10M |

| CPIPP TITLE | | DESCRIPTION | PLACEMENT CONSIDERATIONS | COST |
|---|---|---|---|---|
| **6.0** | **CAMPUS SECURITY/SAFETY IMPROVEMENTS** | | | |
| **6.1** | **ACCESS CONTROL/ ADMINISTRATIVE BUILDING** | Facility for public reception and control measures for primary and secondary entrances to increase the District's Protective Measure Index score for physical security as assessed by the Department of Homeland Security. Due to the limited expansion potential of the current Operations building, it is recommended to relocate existing functions to a new Administration Building to allow space for core Operations function expansion. | • Create a Plant 'Hub' by expanding the Maintenance Facility building to the west for administrative functions.<br>• Realign Gate 3 entrance to the east to align with neighborhood street and create a primary entry into the Plant for visitors, employees, and deliveries.<br>• Visitor parking is located to the south of the building along Moorland Road, outside of a controlled perimeter fence.<br>• Employees and deliveries enter the Plant through a controlled access gate.<br>• A Primary perimeter fence will encompass primary Plant functions and establish around-the-clock controlled gate access.<br>• A Secondary perimeter fence allows Metrogro and Septage Hauler access to their facilities without gate control during operating hours. Employee parking could also be within a secondary perimeter fence to reduce traffic flow through controlled access points.<br>• Remove residential home to reduce Plant liability and reserve for future Plant functions. | $19,400,000-22,500,000 (assume LEED certification) |
| **6.2** | **SITE CIRCULATION** | Improve internal Plant circulation routes to mitigate conflict areas and provide separate facilities for pedestrians and bicyclists where appropriate. This may be done with CPIPP 6.1 or with other CPIPP projects needing circulation improvements or changes. | Pedestrian and Bicycle<br>• Separate pedestrian and bicycle circulation from vehicular in areas of high traffic.<br>• Connect to the Capital City Trail.<br>• Connect to the bus stop on Moorland Road.<br>• Reduce need to cross Raywood Road or Moorland Road to service Plant functions.<br>• Reduce internal Plant vehicular circulation. Free up roadways for pedestrians and bicyclists.<br>• Promote walking by locating staff functions near each other.<br>Vehicular<br>• In conjunction with CPIPP 2.0 and 3.0, modify heavy vehicle circulation routes to reduce overall conflicts and remove blind spots.<br>Wayfinding<br>• Name internal Plant streets and install street signs.<br>• Add wayfinding signage at intersections, parking lots, and all publicly accessed facilities. | $460,000 - 600,000 |

| CPIPP TITLE | | DESCRIPTION | PLACEMENT CONSIDERATIONS | COST |
|---|---|---|---|---|
| **7.0** | **GENERAL WORKPLACE IMPROVEMENTS** | | | |
| **7.1** | **OPERATIONS BUILDING** | With the relocation of certain work groups to a new Administrative Building (CPIPP 6.1), this creates an opportunity to renovate the second floor of the Operations Building for remaining staff, and consideration of space for a lab expansion on the first floor. | • Second floor renovation<br>• Lab Expansion | $8,720,000 - $10,000,000 |
| **7.2** | **MAINTENANCE FACILITY BUILDING** | Renovation and expansion to the Maintenance Facility Building to accommodate functions currently housed in Storage Buildings No.1 and 2, and Maintenance Shop No. 2. Relocate inventory functions to allow for staff expansion and expand parts storage and staging areas. | • Expand staff workspace<br>• Expand/Relocate Storage and Receiving to consolidate and centralize maintenance inventory and equipment in one location (includes chemical storage).<br>• Expand Fleet storage, include infrastructure for electric fleet vehicles. | $9,330,000 - $10,300,000 |
| **8.0** | **PLANT EXPANSION AND TERTIARY TREATMENT** | Additional secondary treatment capacity and/or the addition of tertiary treatment processes. | Secondary Treatment Expansion<br>• Conservative estimate of space needs is 10-15 acres.<br>• Located to the west of Biosolids End-use Building, extending to the western Plant boundary.<br>• Expansion to the northwest is limited due to wetlands.<br>Tertiary Treatment<br>• Located to the east of the Effluent building.<br>• Requires removal of Storage Building No.1. | N/A |
| **9.0** | **PLANT-WIDE STORMWATER SYSTEM** | With the eventual incorporation of the Nine Springs Wastewater Treatment Plant into the City of Madison and the availability of space due to the relocation of storage functions, a plant-wide stormwater management facility is recommended. | • Along existing drainage patterns and low areas.<br>• Northeastern corner of the Plant in the vicinity of Storage Buildings No.1 and 2, and Maintenance Shop No.2.<br>• Between Effluent Storage Reservoir No.2 and Raywood Road. | $2,180,000 |
| **10.0** | **SOLIDS DIGESTION EXPANSION** | Expansion of the solids digestion process to accommodate organic solids process, high-strength waste, and increases in accepted waste for energy production. | • Realign Raywood Road to the east.<br>• Realign Raywood Road and Moorland Road intersection, add a roundabout.<br>• Additional 4-4.5 acres captured within contiguous Plant area<br>• Area could accommodate additional digesters and a High Strength Waste Facility.<br>• An option for a stand-alone High Strength Waste Facility. | $4,840,000<br>(Raywood Road Realignment only) |


NINE SPRINGS WASTEWATER TREATMENT PLANT | CAPITAL PROJECT INFRASTRUCTURE PLACEMENT PLAN
FULL BUILD EXHIBIT | MAY 10, 2023

Madison Metropolitan Sewerage District

TKDA

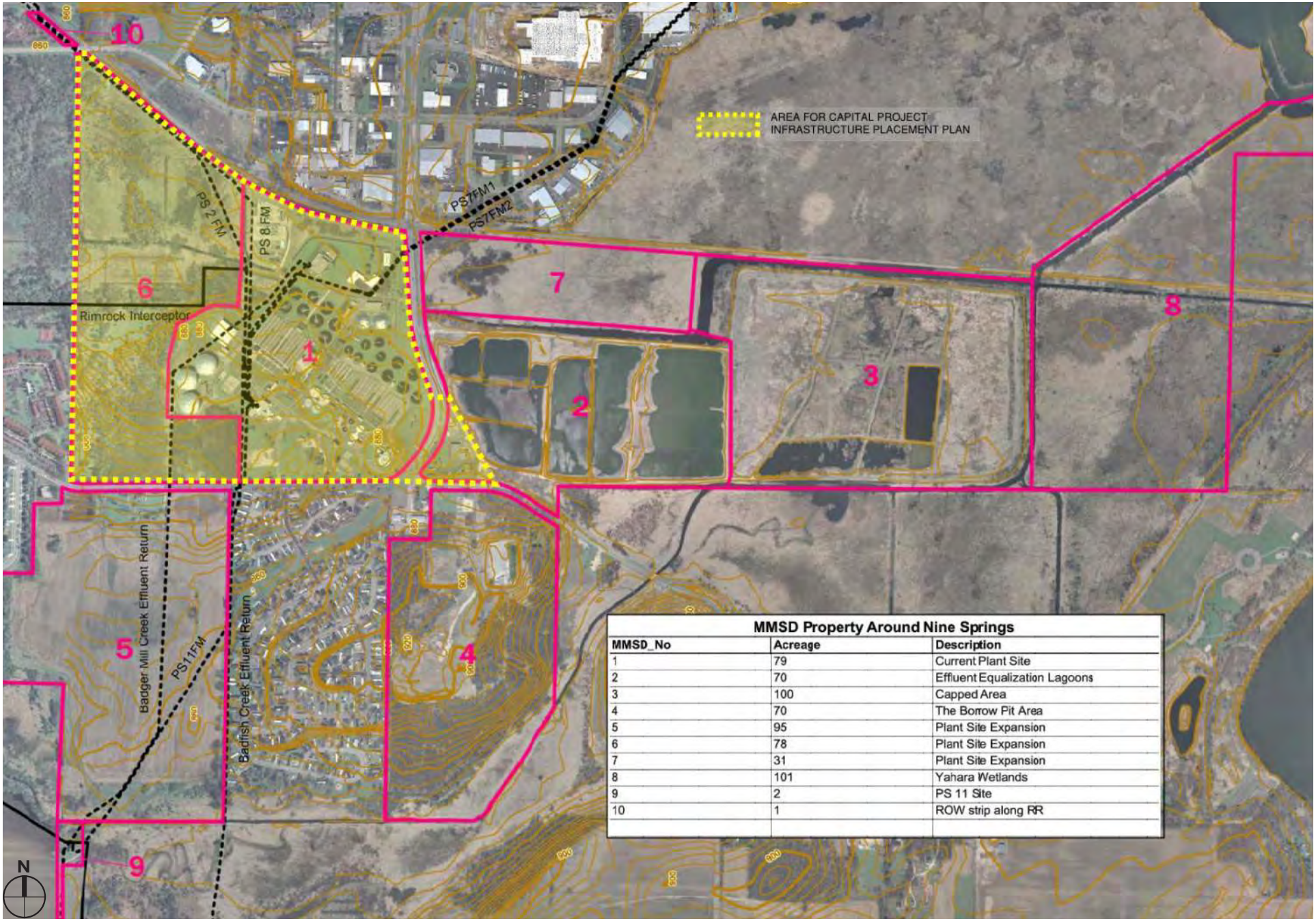
# Chapter One: Overview

## Introduction

As the Madison Metropolitan Sewerage District (the District or MMSD) has grown, decisions where to locate new infrastructure have been accomplished on a project-by-project basis. The District has determined this approach is not sustainable. The District desires to develop a Capital Project Infrastructure Placement Plan for the Nine Springs Wastewater Treatment Plant that satisfies the District's strategic priorities and identifies the preferred location of new infrastructure projects in such a way they do not interfere with future investments, do not create maintenance burdens, and allow for the safe movement of staff and visitors within the plant.

The benefit of this project is to guide the location of future capital projects and will consider:

1. Growth in personnel and growth in office space requirements
2. Modern office and IT needs
3. Staff safety, mobility, and wellness needs
4. Updated treatment and energy infrastructure
5. Maintenance facility, fleet, and general storage needs
6. Public access and security issues associated with the following:
    a. District educational activities
    b. Septage receiving
    c. Volunteers delivering water quality samples
    d. Developers and members of the public delivering permit applications
    e. General project meetings with external contractors and consultants
    f. Members of the public




**MMSD Property Around Nine Springs**

| MMSD_No | Acreage | Description |
|---|---|---|
| 1 | 79 | Current Plant Site |
| 2 | 70 | Effluent Equalization Lagoons |
| 3 | 100 | Capped Area |
| 4 | 70 | The Borrow Pit Area |
| 5 | 95 | Plant Site Expansion |
| 6 | 78 | Plant Site Expansion |
| 7 | 31 | Plant Site Expansion |
| 8 | 101 | Yahara Wetlands |
| 9 | 2 | PS 11 Site |
| 10 | 1 | ROW strip along RR |

Figure 1.0 *Project Area*

The project also benefits the District and its customers because it sets forth an orderly approach to space utilization, site security, and storage at the Nine Springs Wastewater Treatment Plant and, as a result, will maximize the benefit of capital investments. It takes into consideration the following plans:

- 2020 Energy Management Master Plan
- Biosolids Management Plan
- Liquids Processing Facilities Plan
- Solids Handling Facilities Plan
- 50-Year Master Plan

Finally, it will recognize the District's continuing commitment to provide public engagement and education, which will be integrated into the plan.

The project will result in a Capital Project Infrastructure Placement Plan for the Nine Springs Wastewater Treatment Plant. The plan will include placement considerations for those Capital Project initiatives which would impact land use decisions. This includes projects previously included in the District CIP, future land use considerations, and newly identified initiatives as part of this planning process. Planning considerations will include illustrative plans identifying recommended locations along with a narrative describing the placement consideration. Planning level cost estimates are provided for those projects that may be completed within the next five to ten years.

The project does not include the following:

- Design of specific projects
- Analysis or selection of alternatives from previously adopted plans
- Budgetary impact analysis of the alternatives to the District's Capital Program.

## Success Criteria

The project is successful if it:

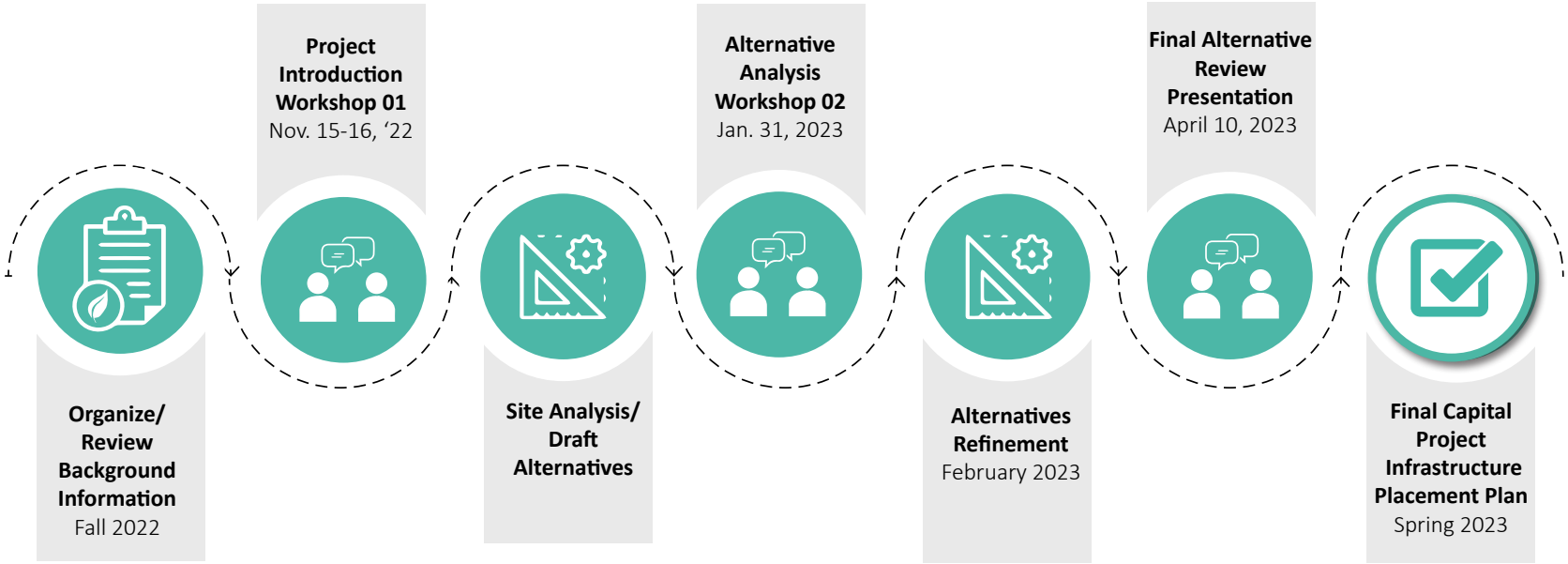
1. Aligns with the District's Strategic Plan, including considering how best to support the District's seven strategic performance areas.
2. Provides information needed for District staff to prepare the 2024 Capital Improvements Plan.
3. It is implementable and is grounded in reality.
4. Reflects interests of District executive team.

## Planning Process

The Capital Project Infrastructure Placement Plan is the result of a 6-month planning process designed to engage District staff on the space needs for future projects and initiatives. Phase 1 of planning involved research and review of background information and an understanding of existing conditions to inform the desired program for the Capital projects. During workshop 01, District staff were engaged in discussions regarding existing Capital Improvement Projects, furture Plant vision, current and future Plant operations and space needs. A Plant tour and staff interviews were conducted to develop the Existing Conditions Summary of Findings. The specific findings are discussed in the Plant Context, Site Analysis, and Building Functionality Assessment chapters.

Phase 2 of planning involved program development for Capital Projects included in the plan. Additional staff interviews were conducted, including meeting with septage haulers. A draft Programmatic Summary of Findings was developed and used to inform the alternatives presented during Workshop 02.

Phase 3 is a refinement of alternatives presented during Workshop 02 based on feedback from staff. Originally, three (3) alternatives were presented, because of the numerous variabilities in the alternatives because of certain impacts on various options for some projects, the approach to the plan pivoted and projects, with recommendations, are presented individually, but keep other project locations in mind to mitigate conflicts. This phase culminates in the final deliverable.



## Project Goals

The goal of the project is to develop the Nine Springs Wastewater Treatment Plant Capital Project Infrastructure Placement Plan. The plan includes recommendations for the placement of ten (10) identified project considerations. Each project consideration will show recommended placement area(s) in an illustrated graphic, along with a narrative that describes the reasoning of site selection for each location or alternative location, if applicable. Associated costs will also be provided, in 2023 dollars for those project anticipated to be completed within the next five to ten years.

1. Locate new infrastructure projects aligned with strategic priorities
2. Consider future infrastructure and maintenance needs
3. Allow for safe movement of staff and visitors

# Chapter Two: Plant Context

## Location

The Nine Springs Wastewater Treatment Plant is located along South Town Drive/ Raywood Road and Moorland Road in the City of Madison and Town of Blooming Grove, Wisconsin. The Plant serves over 407,000 people within 187 square miles of Dane County and includes 25 cities, villages, and utility/sanitary districts. The Plant processes approximately 36 million gallons of wastewater daily.

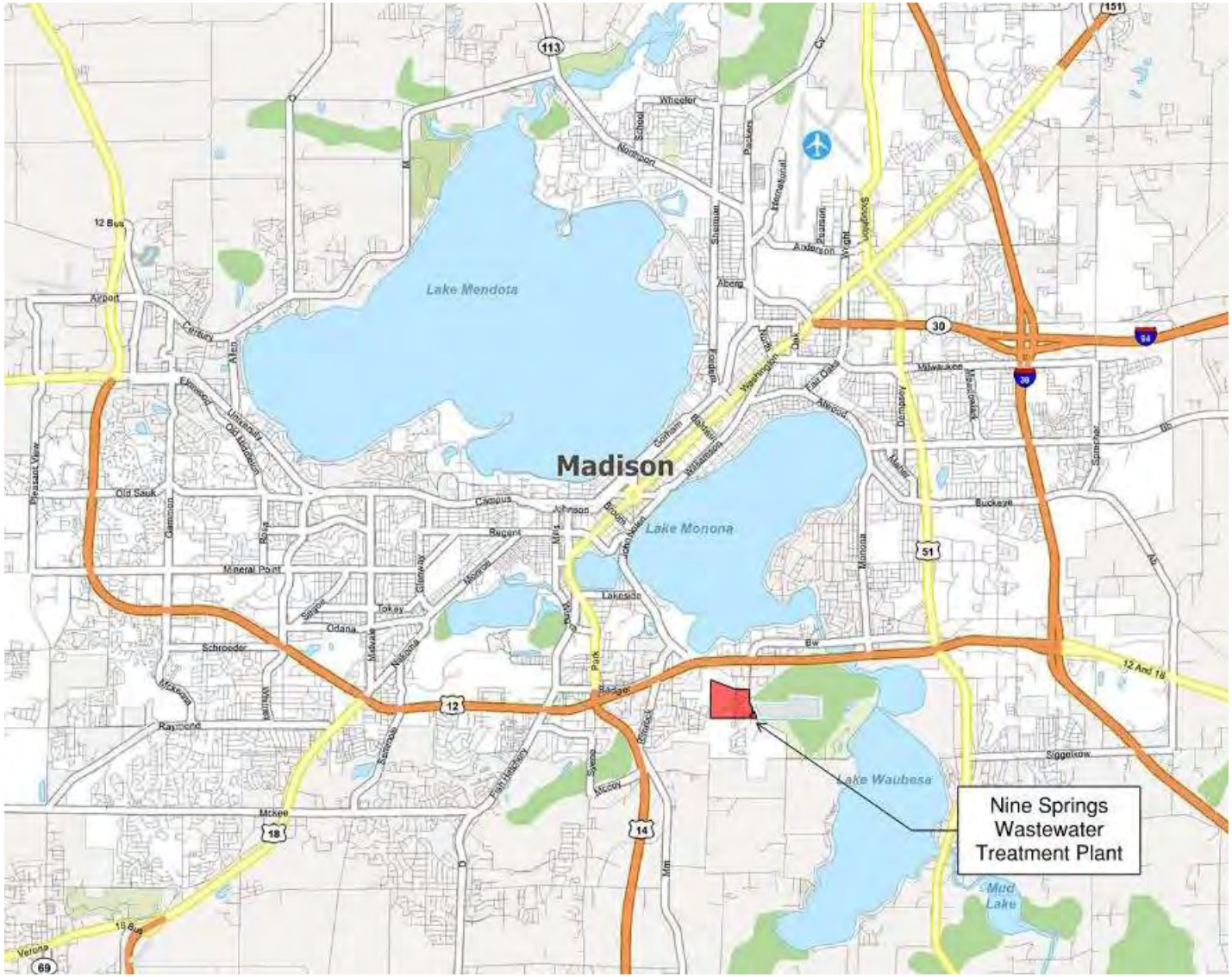



Figure 2.0 *Location Map*

## Plant Development History

The Plant opened in 1930, taking its name from nearby Nine Springs Creek, and is one of the oldest regional sewer utilities in the United States. The plant has expanded its facilities 11 times since 1930. Expansion has occurred in a radial fashion out from the Plant center, in what is the current location of the Operations Building.

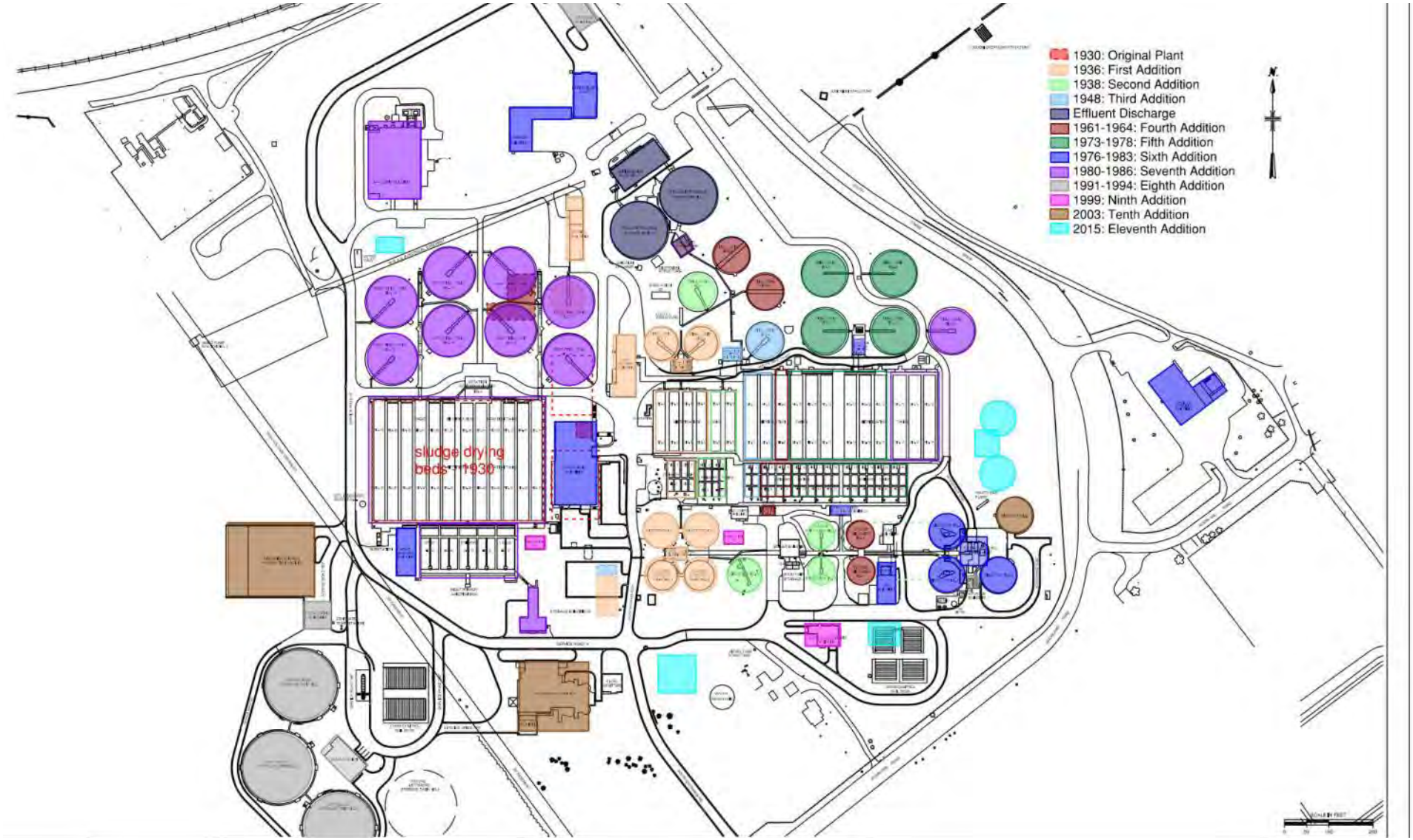



Figure 2.1 *Plant Development*

## Community Character

The Plant is located at 1610 Moorland Road, west of South Town Drive/Raywood Road, in the Rimrock-Moorland neighborhood. The neighborhood is comprised of industrial, single and multi-family residential, and open space land uses on the southern boundary of Madison. The eastern portion of the Plant is currently within the Town of Blooming Grove. The City of Madison plans to complete annexation of the Town of Blooming Grove by 2027. The District is the largest single landowner in the neighborhood.

District parcels containing the main wastewater treatment plant functions are zoned Commercial/Industrial use. To the north of the Plant, separated by the Wisconsin and South Railroad line and the Capital City Trail, are industrial and commercial businesses. To the west of the Plant is the 7 Oaks multi-family residential development.

Moorland Road forms the southern boundary of the Plant, with additional District parcels to the south currently used for agriculture and wildlife management areas, as noted on the Capital Springs State Recreation Area plan. Also, directly south of the plant across Moorland Road between two District parcels is the Highland Manor single-family residential community. Raywood Road/South Town Drive forms the eastern border of the Plant, with marsh and lagoons to the east.

The western portion of the Plant is predominantly wetlands and low-quality woodland. A small community garden is in the southwest corner. This creates the edge condition between the District parcels and the single and multi-family residential development to the west.

The Plant is also situated along the Lewis Nine Springs E-Way, a large ecological network of streams, wetlands, ponds, and recreation areas along the southern edge of Madison and forms a natural transition between urban Madison and agricultural land use to the south.

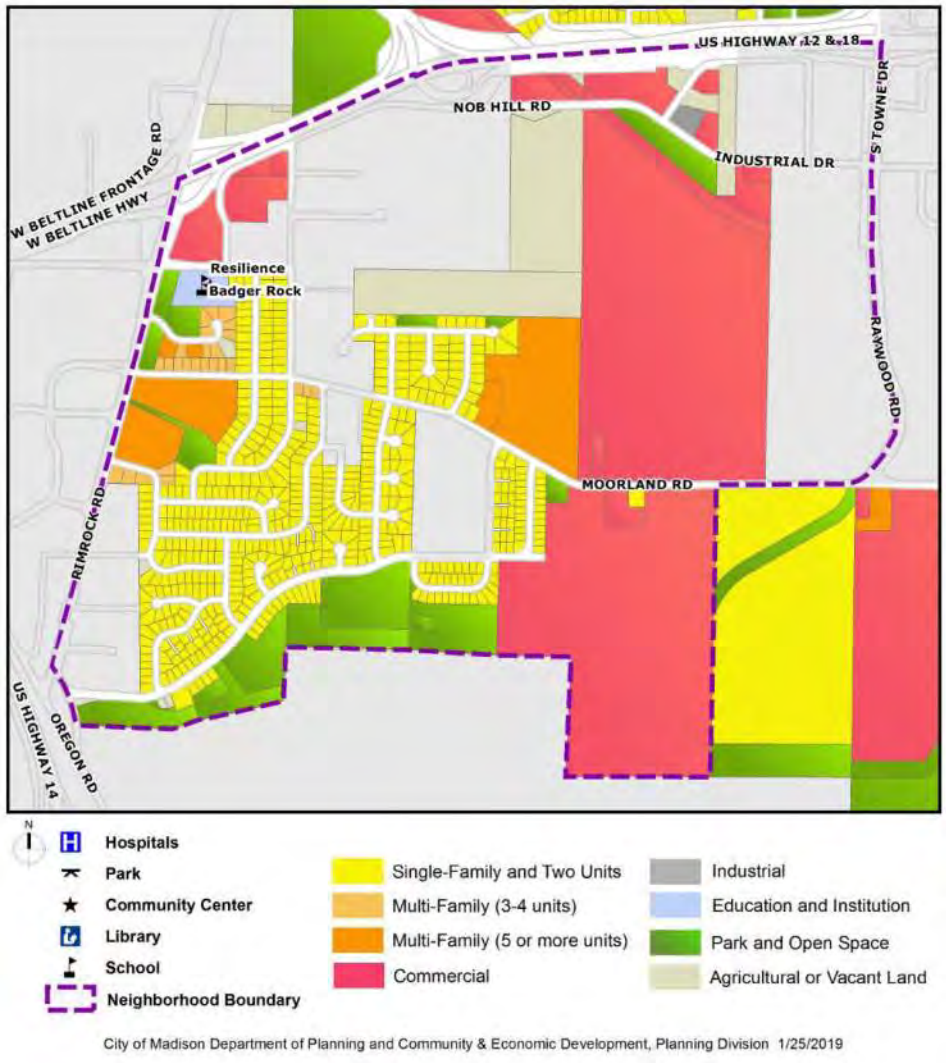



Figure 2.2 *Rimrock-Moorland Neighborhood Land Use*

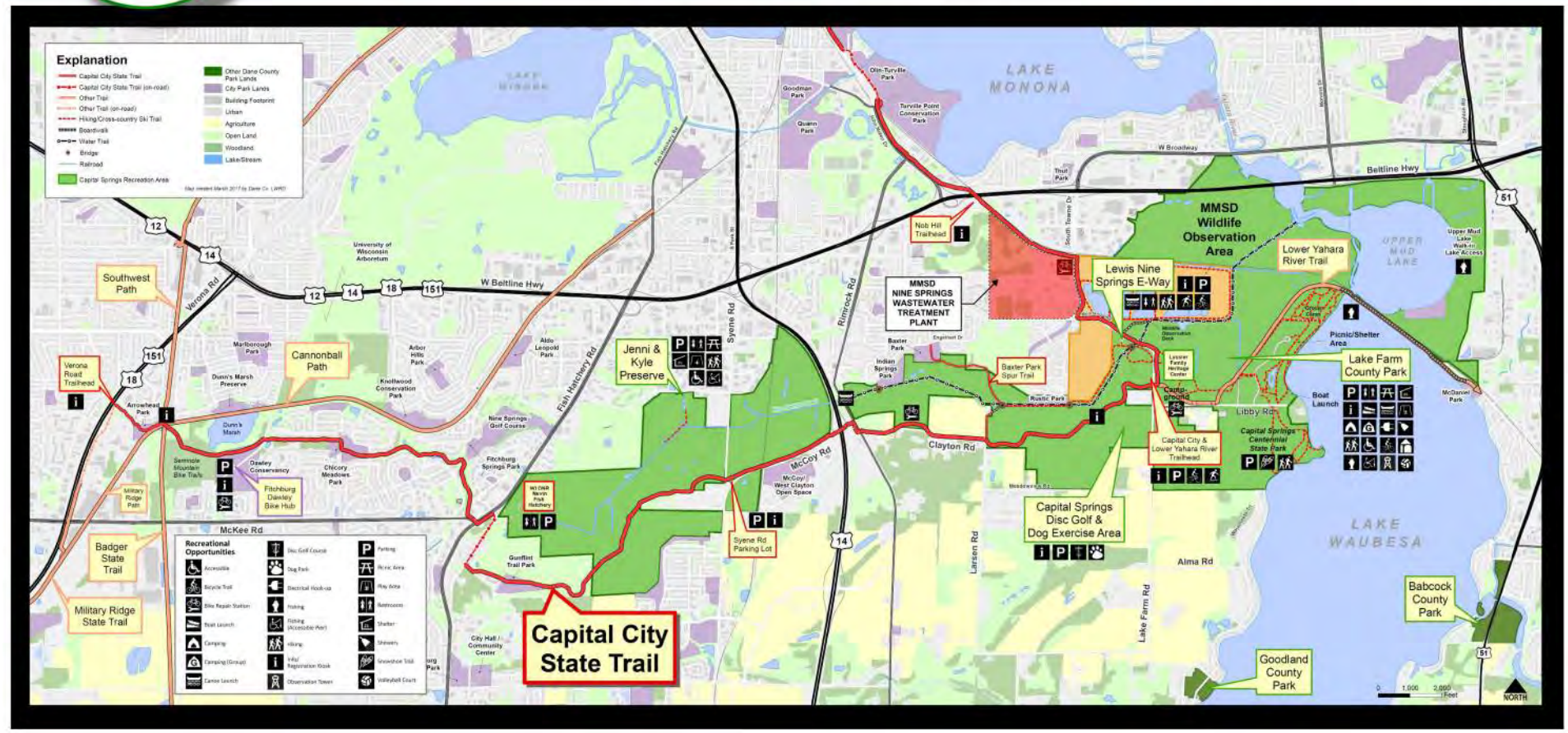



Figure 2.3 *Lewis Nine Springs E-Way*
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# Chapter Three: Operations & Staffing

## MMSD Organization Chart

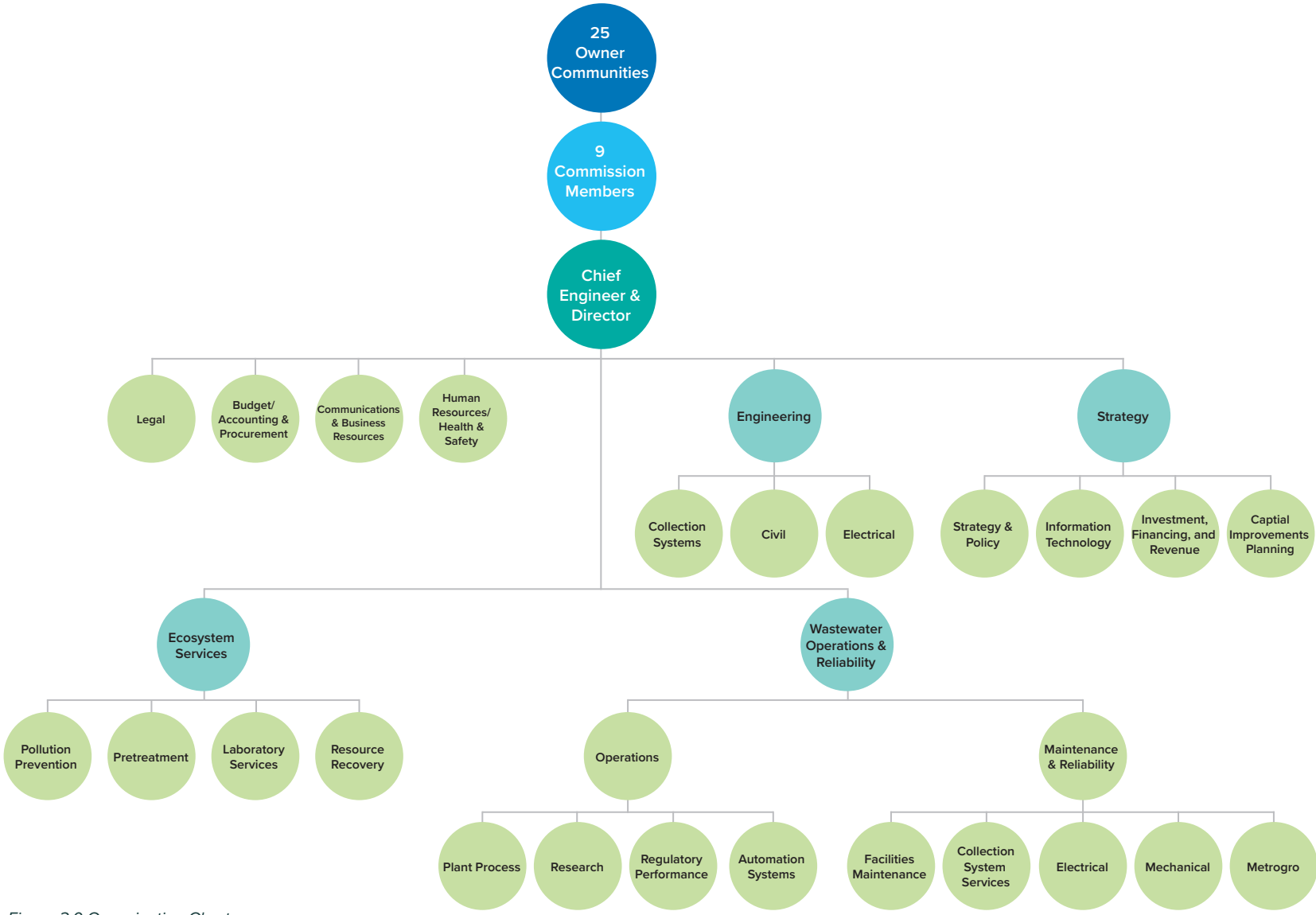


*Figure 3.0 Organization Chart*

## Plant Staff

| DEPARTMENT | FTE (2023) | PROJECTED FTE INCREASE (10 YEARS) |
|---|---|---|
| District Leadership and Support | 17.5 | 5-7 |
| Ecosystem Services | 14 | 1-3 |
| Engineering | 12 | 2-5 |
| Planning and Strategy | 15 | 1-3 |
| Maintenance and Operations | 67 | 10-15 |
| **TOTAL** | **125.5** | **11-22** |

*Table 3.0 Full Time Employment & Projected Increase by Department*

## Plant Operating Hours

- Plant operates continuously 24 hours per day, 365 days per year
- Established Plant hours (Gates Open): 6am – 6pm Monday - Friday
- Plant staff hours: 6am – 4:30pm, except for Plant operators

## Metrogro Operations

Metrogro operations are divided between two locations on the Plant, the Metrogro Vehicle Loading Building (VLB) at the corner of Raywood Road and Moorland Drive and the Metrogro Pumping Station and Storage Tanks located on the western edge of the Plant, north of the Maintenance Facility building. See Appendix F for Metrogro meeting notes.

- Operating Season (weather dependent):
  - Spring: early April through first week in June
    - Summer: July- September, minimal operation
    - Fall: October to freeze-up, around Thanksgiving
- Operating Hours:
  - 6am - 6/6:30 pm (last load out 6:30 pm)
  - Spring/Fall: 7 days per week
  - Summer: 5 days per week
  - Metrogro staff and haulers will work weekends if it is wet during the week
- Typical Operations:
  - Seventeen (17) Metrogro semi-trucks station at the Vehicle Loading Building (VLB) in the morning as contractors/drivers get orders. Trucks are then loaded at either the VLB or Metrogro Pump Station.
  - Trucks enter the VLB from Moorland Road, drive into the building for loading and drive out and exit on Raywood Road. Both driveways cross the Capital City Bike Trail, which can cause conflicts between trucks, pedestrians, and bicyclists.
  - Trucks loading at the Metrogro Pumping Station enter the Plant through Gate 4, drive to the uncovered loading area, then drive around the Plant and exit via Gate 1.
  - Average 170-204 trips daily.
  - Time between loads (vehicles stay within 30 miles of the plant) 45 minutes is a short round, 1.5 hours for a longer round.

## Septage Hauler Operations

There are approximately 40 approved septage haulers using the Plant septage receiving service. Septage is received at the Headworks building. See Appendix F for Septage Hauler meeting notes.

- Operating Season: year-round
- Operating Hours:
  - Haulers work within established Plant gate hours: 6am -6pm M-F, District staff open gates at 5 am weekdays and for emergencies on weekends to accommodate Haulers.
  - Weather and staffing affect arrival/delivery times
- Typical Operations:
  - Haulers enter the Plant through Gate 4, drive to the Headworks building to unload Septage at the receiving trough, then exit the plant via Gate 1.
  - Septage receiving can accommodate two (2) trucks at a time in a covered area.
  - Haulers maneuver around each other within the Plant with approximate waiting times anywhere from 0 to 20 minutes or more, dependent on number of trucks in the queue.
  - Average of 55 trucks per day, Monday – Friday, with an average volume of 2,600 gallons per truck. Over a typical year, the Plant receives 100,000 gallons per operational day.

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# Chapter Four: Site Analysis

A site analysis is a key step in a planning process to provide crucial information about the physical and environmental characteristics of a site to inform building placement decisions that are functional and responsive to its surroundings.

## Current Land Use

The Plant is organized into three main functional areas, Plant process, maintenance facilities, and Metrogro (Biosolids). Plant process, which includes primary and secondary wastewater treatment functions, is central to the property; maintenance functions are separated in the northeast and southwest corners of the site and Metrogro operations is divided between the southeast corner of the site and to the west of process functions.

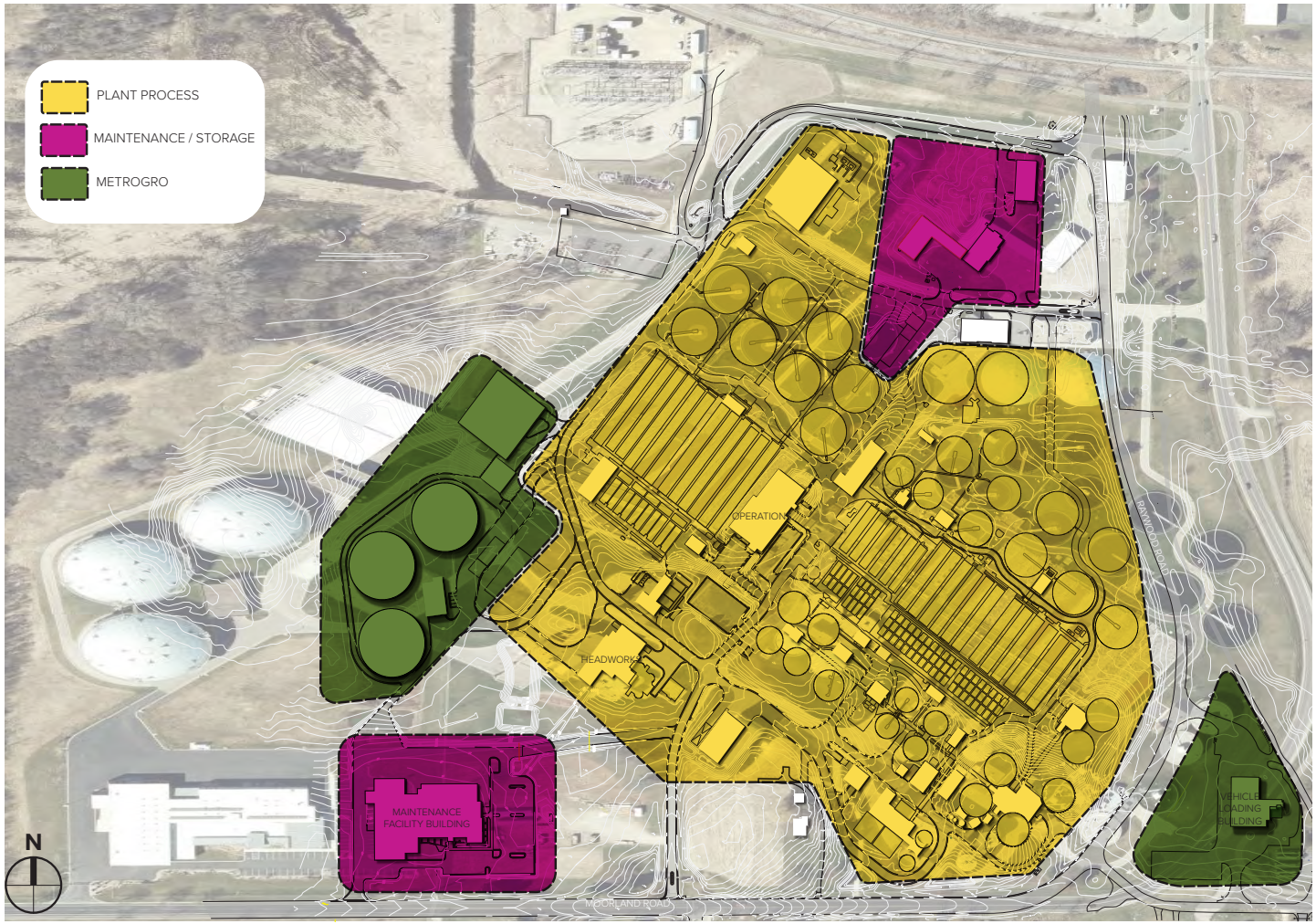


Figure 4.0 *Site Land Use*


*Figure 4.1 Ecological Systems*

## Topography

Slopes in the Plant run from the high point on the south side along Moorland Road to a low area to the north. The site elevation drops 40-50 feet to both the northeast and the northwest. Before development, a small stream flowed where the current service road is adjacent to the Effluent Building and Shop One. This natural slope is a benefit for the wastewater treatment process where wastewater arrives to the Plant at the Headworks building and flows via gravity pipes during the treatment process. Many buildings on the site are built into the slope, which can pose a challenge for pedestrian accessibility.

## Hydrology

The Plant is within the Nine Springs Creek watershed. The watershed comprises Nine Springs which drain into Nine Springs Creek, eventually flowing into Upper Mud Lake. Drainage within the Plant follows the natural topography and flows south to north on the site. Due to Plant development, there is little on-site stormwater management, except infiltration basins to the north of the Maintenance Facility Building. Plant roadways direct most surface flows to low areas or catch basins. A portion of stormwater is collected and discharged into the wastewater treatment process and the remaining stormwater is directed to a collector pipe that flows from west to east and daylights in the wetland complex east of South Towne Drive.

Due to time of development and LEED certification, the Maintenance Facility Building incorporates stormwater management into the overall landscape design, recognizing the ecological benefit of managing stormwater on-site. Rainwater is captured from the roof and treatment is integrated as part of the site landscape. The stormwater from the building and parking lots is then directed to a series of infiltration basins located north of the building.

## Ecology

The Plant is located within the Southeastern Wisconsin Till Plains Level III ecoregion in the classification system of the United States Environmental Protection Agency (EPA), where it is designated as ecoregion number 53. The ecoregion represents a transition between the hardwood forests and oak savannas to the west and the tallgrass prairie ecoregions to the south; today it is mostly covered by cropland.

This region supports a mix of agriculture (mostly cropland and dairy operations) and woodland. Crops include forage crops to support the dairy operations and a wide range of specialty crops. Most of the original vegetation has been cleared with forested areas remaining only on steeper hillsides/bluffs and poorly drained depressions. Irregular till plains, steep hillsides, marsh potholes, and drumlins are common, and wetlands are found throughout the region, especially along ridges. The potential natural vegetation (PNV) of this region is transitional with a mosaic of sugar maple, basswood, and oak to the east and an increasing amount of white, black, and bur oak, oak savanna, prairie, and sedge meadows toward the west.

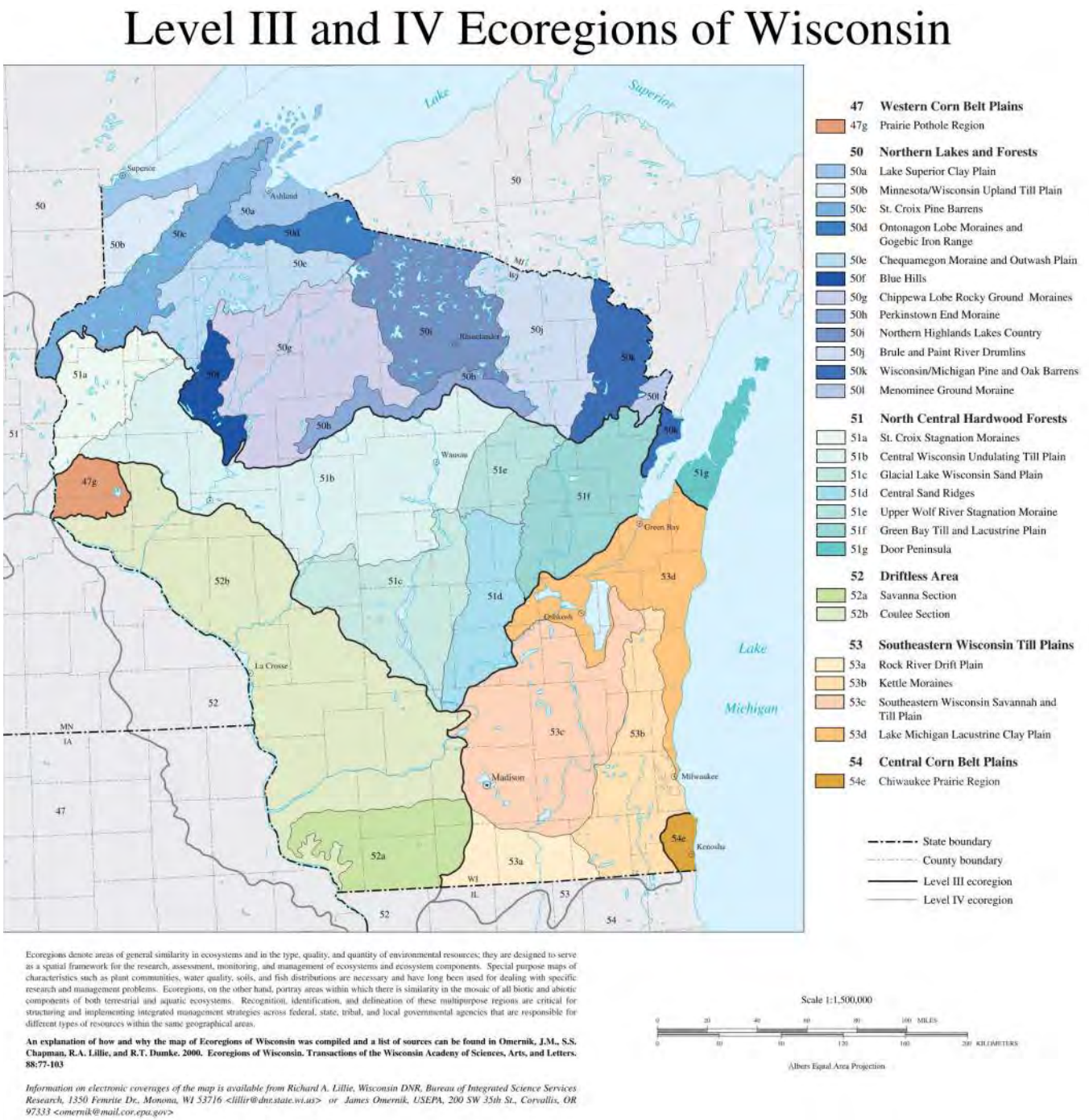


Figure 4.2 *Ecoregions of Wisconsin*

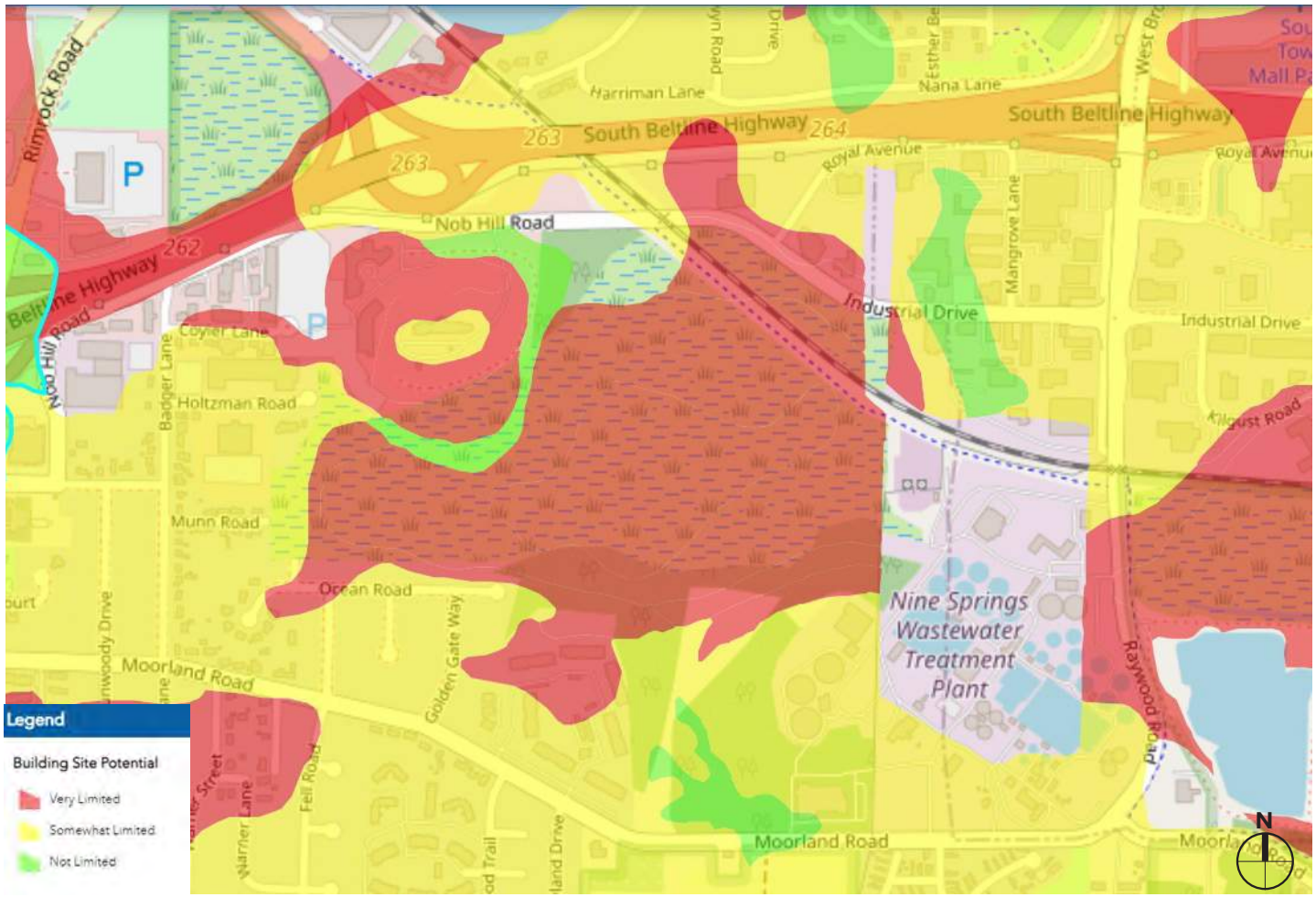


Figure 4.3 *Soil Suitability for Building*

Currently, the Plant site is mown turf with informal landscaping of evergreen and deciduous trees in developed areas on the eastern portion. The western undeveloped portion of the property is comprised of low-quality woodland on the south and marshland plants to the north.

### Soils

Peat soils are predominant throughout the marshlands of the Nine Springs Creek watershed, including the northern part of the Plant. The southern portion of the Plant contains soil suitable for building.

# Site Circulation

## Pedestrian and Bike

Pedestrians and bicyclists can reach the Plant via the Capital City Bike Trail. The trail is adjacent to the Plant on the northern boundary and crosses South Town Drive just north of Gate 1, see descriptions for Plant gates in the next section. There aren't any direct pedestrian or bike connection to the Plant. There is a lack of pedestrian and bicycle facilities within the Plant itself. Sidewalks link parking lots to adjacent buildings. Pedestrian and bicyclist movement throughout the Plant, including plant tour groups, share the road with vehicular traffic, including Metrogro semi-trucks and applicators, and Septage Hauler trucks.

## Vehicular

The Plant has one address for the entire facility, 1610 Moorland Road. Since there is only one address for the entire Plant, this creates confusion among visitors and guests on which entrance to use to reach their destination. The District website provides a map for directions to the Operations Building. Most visitors and guests come to the Plant for either a tour, starting at Shop One; a meeting, at either the Operations Building or the Maintenance Facility Building; or to drop off samples. Deliveries are received at either the Operations Building or the Maintenance Facility Building.

There are five (5) access points into the plant, these are referred to as Gates, with the exception of the residence driveway.

## Gate 1

The northern-most gate and is located off South Town Drive.

- One of two (2) primary entrances to the Plant
- Located on the northern boundary, just south of the railroad tracks and Capital City Bike Trail crossing. Drivers may miss this gate due to attention at railroad and bike trail crossings
- Gate is not well-marked with signage or landscaping
- Sliding chain-link gate with key-card operation
- Provides access to MG&E (Madison Gas & Electric) NIne Springs Substation

## Gate 2

One of the original Plant entrances and is located south of Gate 1 on South Town Drive.

- Only open if Gate 1 is malfunctioning and for public events at Shop One
- Well-signed, with brick monument signage, and landscaped
- Gives the impression of a primary entrance
- Sliding chain-link gate, keyed access

*Figure 4.4 Gate 1*

*Figure 4.5 Gate 2*

### Gate 3

Gate 3 entrance is on the south side of the Plant along Moorland Road and has been closed since Gate 4 opened with the Maintenance Facility Building. A pedestrian gate was installed in December 2022 to allow access from the Plant to the bus stop (Bus Route 16) located on the east side of Gate 3 and across from the Highland Manor community.

- Well-signed, with brick monument signage matching Gate 2 and landscaped
- Gives the impression of a primary entrance
- Sliding chain-link vehicular gate , key card access
- Pedestrian gate


*Figure 4.6 Gate 3*

### Gate 4

Gate 4 is the newest entrance into the Plant and is the primary ingress/egress for deliveries, staff, and visitors to the Maintenance Facility Building. It also is the entrance for Metrogro vehicles and septage haulers. Due to high traffic and the entrance adjacent to the Maintenance Facility Building, there is a blindspot at the southwest corner where the parking lot entrance and vehicle maintenance bays intersect with the roadway, causing vehicular conflicts on the west side of the Maintenance Facility Building. This is also the location of the loading dock for the Vehicle Maintenance Building.

Located to the west of Gate 3 on Moorland Road.

- One of the Primary gates, recently opened in 2016 with the Maintenance Facility Building
- Sliding chain-link gate, remote controlled
- This gate has no signage and minimal landscaping


*Figure 4.7 Gate 4*

### Residential Gate

This gate controls access to the single-family home leased out by the District. The entrance is marked with a residential mailbox.

- Located at 1600 Moorland Road, east of Gate 3
- Sliding chain-link gate, key pad access
- Gate is predominantly left open

*Figure 4.8 Residential Gate*

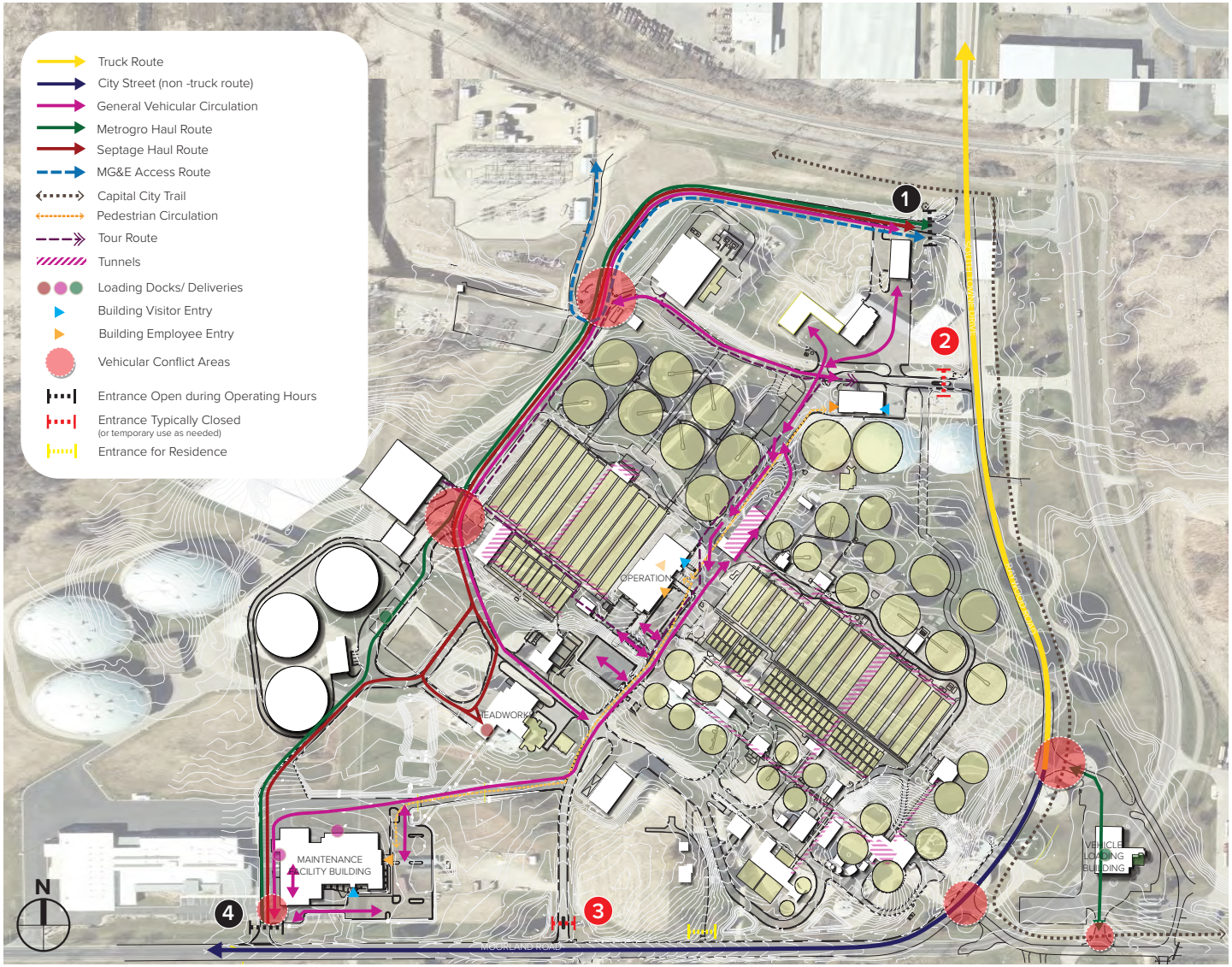


*Figure 4.9 Existing Circulation*

Maintenance and staff circulation within the Plant mainly occurs between the Maintenance Facility Building, the Operations Building, and the Storage and Service Buildings.

Plant roadways are unnamed and lack way-finding signage, which causes confusion for visitors, guests, and delivery drivers. The primary vehicular circulation route through the Plant occurs between Gate 1 and Gate 4. Due to the narrow roadway width and use by large Metrogro equipment, septage haulers, and maintenance vehicles creates many traffic conflict areas, notably where the roadway curves near the MG&E substation and at the intersection of roadways near the Effluent building.

## Safety/Security

The Department of Homeland Security Cybersecurity and Infrastructure Security Agency (CISA) leads the national effort to understand, manage, and reduce risk to our cyber and physical infrastructure. Property treating wastewater is vital for preventing disease and protecting the environment. Therefore, the Department of Homeland Security and CISA has determined wastewater systems are considered National Critical Functions. In its review of the Nine Springs Plant conducted in 2019, primary concerns were with lack of consistent security fencing and consolidated, monitored access points.

Primary buildings receiving visitors, guests, and deliveries are Operations Building, Maintenance Facility, and Shop One. Each of these buildings are spread-out in the Plant. All visitors and guests are required to check-in either at the Operations building, which is in the center of the Plant; or the Maintenance Facility along Moorland Road. This can cause confusion for visitors and guests when trying to find their destination.

### Building Controls

The district's main operational buildings, the Operations building and Maintenance facility, have controlled access. The building access controls range from FOB card access, physical key access, and visitor guest check-in desks. There is protocol in place for all visitors to check-in at the Operations building.

Process and storage buildings do not have access control except physical key access.

## Fleet Storage and Parking

Currently, there are 207 personal vehicle parking stalls in the Plant, including five accessible stalls. There is a small parking lot to the east of Shop One to serve events and tours and serves as the bus drop-off area for school groups. The Operations Building has a small parking lot directly in the front of the building, along with parking lots to the south. Due to the building's design into the site topography, upgrades were needed for accessibility from the parking lots to the building entrance. This involved the construction of a bridge over the entrance of the subgrade parking area. Fleet storage is limited to the small subgrade parking area.

The Maintenance Facility has a parking lot for visitors to the south and a larger parking lot to the east for staff and visitor overflow. Parking is also located throughout the Plant for fleet/maintenance vehicles and deliveries.

Equipment lists on the following pages show the extent of the various types of equipment stored on site and their locations. Metrogro Operations has the largest equipment and it is currently stored across three (3) spearate areas of the Plant.

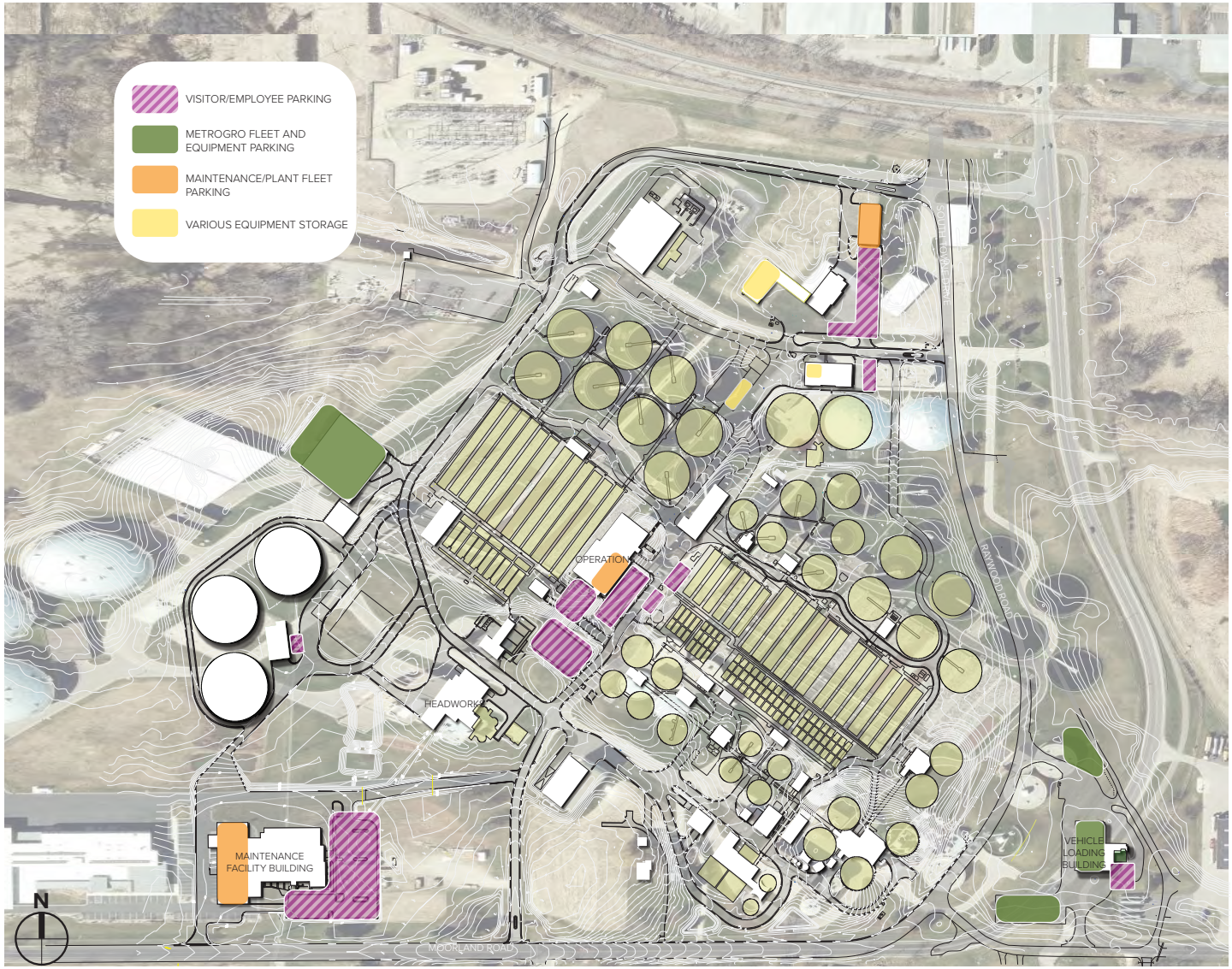


*Figure 4.10 Parking and Fleet Storage*

| Year | Make | Model | Vehicle Type | Storage Location |
|---|---|---|---|---|
| 1986 | GMC | | Truck | Storage Building 1 |
| 2000 | Chevy | 3500 | Flatbed | |
| 2000 | GMC | Sierra | Service Truck | |
| 2002 | Ford | F250 | Pickup | |
| 2003 | GMC | Sierra | Pickup | VLB |
| 2003 | GMC | Sierra | Service Truck | MF Garage |
| 2004 | Ford | Ranger | Pickup | Operations |
| 2004 | Aluma | | Trailer | Shop One |
| 2005 | Chevy | Colorado | Pickup | Operations |
| 2005 | Chevy | Express | Cargo Van | Operations |
| 2005 | GMC | Sierra | Service Truck | MF Garage |
| 2006 | Dodge | Grand Caravan | Minivan | MF Garage |
| 2006 | Dodge | Caravan | Minivan | MF Garage |
| 2007 | Ford | Ranger | Pickup | MF Garage |
| 2007 | Dodge | Ram | Pickup | |
| 2007 | Ford | Econoline | Cargo Van | MF Garage |
| 2008 | Chevy | Uplander | Minivan | Operations |
| 2008 | Ford | F150 | Pickup | MF Garage |
| 2008 | Ford | F150 | Pickup | VLB |
| 2008 | Ford | F150 | Pickup | MF Garage |
| 2008 | Dodge | Ram | Pickup | MF Garage |
| 2009 | Ford | Focus | Sedan | MF Garage |
| 2009 | Ford | Econoline | Cargo Van | MF Garage |
| 2011 | Ford | F350 | Dump box truck | MF Garage |
| 2011 | Ford | F350 | Flatbed Utility Truck | MF Garage |
| 2011 | Ford | F450 | Service Truck | MF Garage |
| 2012 | Ford | F350 | Service Truck | MF Garage |
| 2012 | Ford | Econoline | Cargo Van | MF Garage |
| 2013 | Ford | F150 | Pickup | VLB |
| 2014 | Ford | F350 | Service Truck | MF Garage |
| 2014 | Ford | Econoline | Cargo Van | MF Garage |
| 2014 | Ford | Transit | Cargo Van | MF Garage |
| 2015 | Ford | Transit | Cargo Van | MF Garage |
| 2016 | Nissan | Leaf | Sedan | Operations |
| 2016 | Ford | F250 | Pickup | MF Garage |
| 2017 | Dodge | 1500 | Cargo Van | MF Garage |
| 2017 | Ford | F150 | Pickup | MF Garage |
| 2018 | New Holland | T5.110 | | Storage Building 1 |
| 2019 | Ford | | Truck | MF Garage |
| 2019 | Ford | F350 | Truck | MF Garage |
| 2019 | Ford | | Truck | MF Garage |
| 2019 | Ford | F350 | Truck | VLB |
| 2019 | Nissan | Frontier | | MF Garage |
| 2019 | Nissan | Frontier | | MF Garage |
| 2020 | Dodge | RAM 1500 | Truck | MF Garage |
| 2020 | Dodge | Ram 3500 | Truck | MF Garage |
| 2020 | Dodge | RAM 1500 | Truck | Ops Buidling |
| 2020 | Nissan | NV200 SV | | MF Garage |
| 2020 | Dodge | Ram 2500 | Truck | MF Garage |
| 2021 | GMC | Canyon | Truck | Ops Buidling |
| | Bobcat | Skid Steer | | Storage Building 2 |
| | Bobcat | Tool Cat | | Storage Building 2 |
| | Electric Carts | 6 total | | MF Garage |
| | Electric carts | 3 total | | Ops Buidling |
| | John Deere | End Loader | | Storage Building 1 |
| | Var. Lawn Mowers and ATV | | | Service Building |

*Table 4.0 Updated from August 2018 Fleet Management Plan*

| Year | Make | Vehicle Type | Storage Location |
|---|---|---|---|
| 2021 | OXBO | Applicator | End Use Building |
| 2004 | Ag-Chem | Applicator | End Use Building |
| 2005 | Ag-Chem | Applicator | Metrogro Parking |
| 2006 | Ag-Chem | Applicator | End Use Building |
| 2005 | Ag-Chem | Applicator | End Use Building |
| 2008 | Ag-Chem | Applicator | End Use Building |
| 2019 | Oxbo | Applicator | Metrogro Parking |
| 2022 | Oxbo | Applicator | End Use Building |
| | | | |
| 1993 | Ford | Semi-Tractor | Metrogro Parking |
| 1993 | Ford | Semi-Tractor | Metrogro Parking |
| 1995 | Ford | Semi-Tractor | Metrogro Parking |
| 1995 | Ford | Semi-Tractor | Metrogro Parking |
| 1995 | International | Semi-Tractor | Metrogro Parking |
| 1995 | International | Semi-Tractor | Metrogro Parking |
| | | | |
| 2021 | Brenner | Tanker Trailer | Metrogro Parking |
| 2000 | STE | Tanker Trailer | Metrogro Parking |
| 2000 | STE | Tanker Trailer | Metrogro Parking |
| 2004 | STE | Tanker Trailer | Metrogro Parking |
| 2004 | STE | Tanker Trailer | Metrogro Parking |
| 1999 | STE | Tanker Trailer | Metrogro Parking |
| 1999 | STE | Tanker Trailer | Metrogro Parking |
| 1997 | Presvac | Tanker Trailer | Metrogro Parking |
| 1996 | Presvac | Tanker Trailer | Metrogro Parking |
| 1980 | IME | Tanker Trailer | Pit Area |
| 1980 | IME | Tanker Trailer | Pit Area |
| 1980 | IME | Tanker Trailer | Pit Area |
| 1980 | IME | Tanker Trailer | Pit Area |
| 1980 | IME | Tanker Trailer | Pit Area |
| 1980 | IME | Tanker Trailer | Pit Area |
| 2010 | Brenner | Tanker Trailer | Pit Area |
| 2022 | Brenner | Tanker Trailer | Pit Area |
| | | | |
| Unknown | Unknown | Nurse Tank | End Use Building |
| Unknown | Unknown | Nurse Tank | End Use Building |
| Unknown | Unknown | Nurse Tank | End Use Building |
| Unknown | Unknown | Nurse Tank | End Use Building |

*Table 4.1 Metrogro Fleet*

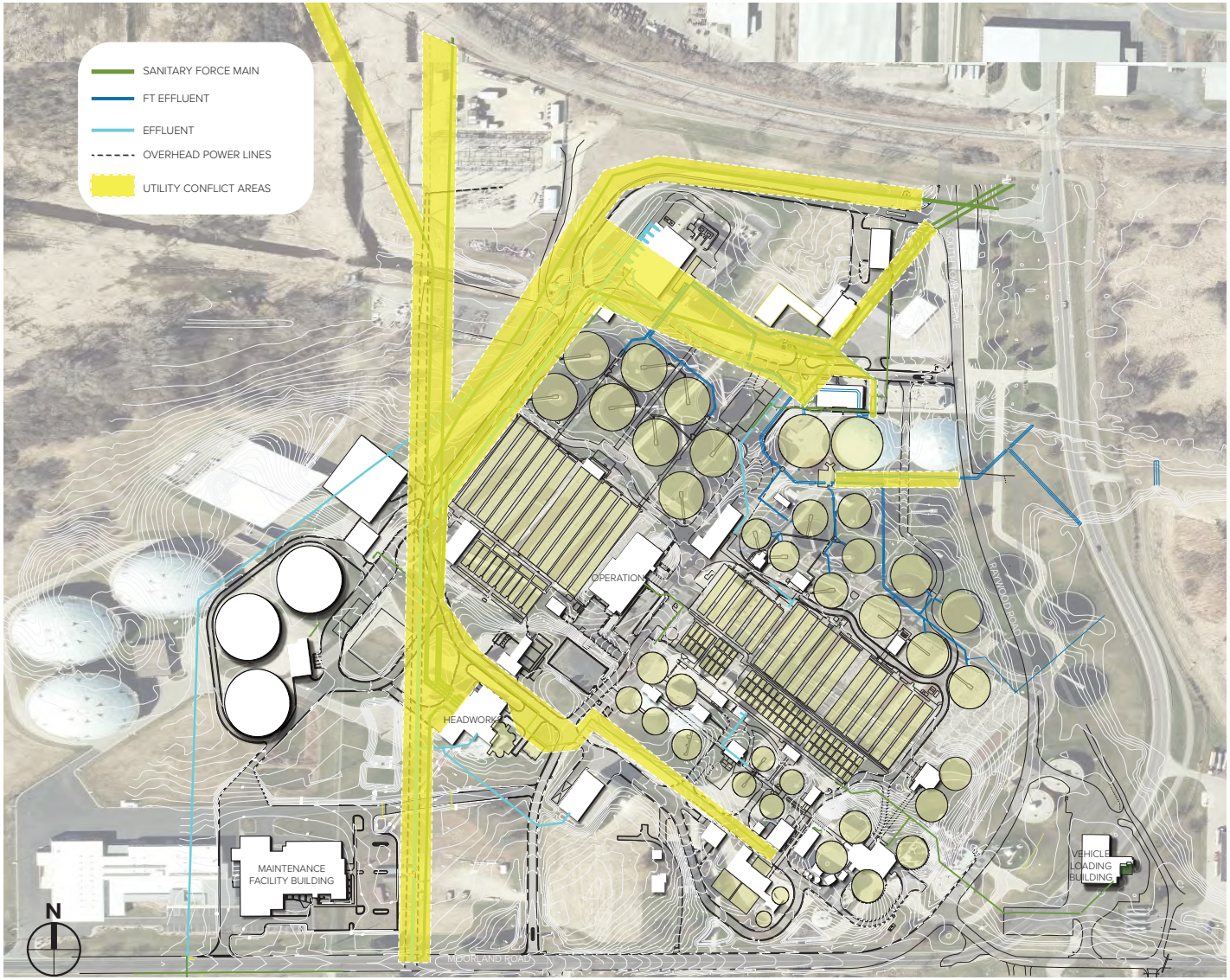


*Figure 4.11 Utility Conflicts*

## Utility Constraints

There are many underground utilities in the Plant, between the process equipment and under paved roadways. Madison Gas and Electric (MG&E) has a substation on the northern boundary of the Plant and an overhead powerline easement runs north/south through the Plant. Underground utilities are co-located within this easement. Untreated water (influent) enters the Plant Headworks building via five (5) force mains. Treated water (effluent) leaves the Plant from the Effluent building via two force mains. The influent and effluent force mains, along with the MG&E easement create “no-build zones,” where buildings and structures are prohibited.

While other local Plant utilities may be relocated, placement of any new building or structure should consider utility locations to reduce Plant operational disruption and costs. Local Plant utilities under the roadways will have additional costs to relocate versus those located within turfed areas. Relocation of utilities may require process outages and/or temporary conveyance.

Access to utilities and easements is required for maintenance and repairs.

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# Chapter Five: Building Functionality Assessment


Figure 5.0 *Existing Conditions - Plant Map*

Unlike a traditional physical condition assessment, which identifies condition deficiencies and determines the necessary actions to bring the site, building or infrastructure back to its original condition, a functionality assessment evaluates how well facilities are functioning for an assigned program. For this planning-level effort, the functionality assessment considers the building's design and layout, current support functions, and its ability to accommodate the specific needs of its occupants. This assessment is conducted to identify any issues or deficiencies that may affect the building's overall functionality, safety, and comfort.

There are 54 buildings within the Plant. The Capital Project Infrastructure Placement Plan (CPIPP) focuses on buildings that house staff functions or are included in an identified project in the 2023 Capital Improvement Program (CIP).

- Operations Building (Campus Security, Workplace Improvements)
- Maintenance Facility Building (Workplace Improvements)
- Vehicle Loading Building (Biosolids Improvements)
- Shop One (Workplace Improvements)
- Headworks Building (Septage Receiving)

Chapter Five is organized by building. It provides a description of the building, staffing, function, and floor plans (if available). Each building section concludes with planning considerations.

## Operations Building

**(DISTRICT BUILDING ID NO. 24)**

The Operations Building was constructed during the Plant's Sixth Addition in 1978. Lab space was added in 1993 to the southwest. The building was recently renovated in 2014 and again in 2020. The 2020 renovation included lab renovation and a new breakroom on the first floor along with improved accessibility from the parking lot to the main building entrance. The building is built into the topography with vehicular access on the lower level. This creates accessibility issues from parking areas to main entrance on the first floor.

### Operations Building Staff

| DEPARTMENT | FTE (2023) | LTE[1], VTE[2], Interns | Projected Staff Increase (10 years) |
|---|---|---|---|
| CED | 1 | | |
| Communications and Resource | 6 | 1 | 4-6 |
| Finance and Procurement | 6 | | 2 |
| Human Resources | 3 | | 1 |
| Planning and Strategy | 6 | 2 | 1-3 |
| Engineering | 12 | 2 | 7 |
| IT Services | 7 | 4 | 2 |
| Ecosystem Services | 8 | | 4-6 |
| Lab Services | 7 | 1 | |
| Operations | 19 | 3 | 4-6 |
| **TOTAL** | **75** | **13** | **23-31** |

*1. Limited Term Employee*

*2. Variable Term Employee*

*Table 5.0. Operations Building Staff*

## Building Function

The Operations Building is the core of Plant Operation control. Visitors and guests are directed to this building to check-in, per the District website and by staff. The primary building entrance is on the first floor on the east side of the building, with additional employee entrances on the first floor and the basement.

Building Total Square Footage: 45,539

## First Floor Program

- Visitor/Guest check-in
- Lab
- Control room
- M/W Locker rooms
- Meeting room (1)
- General offices (11) (Lab, Operators, Resource Team)
- Workstations (8)
- Storage and support spaces

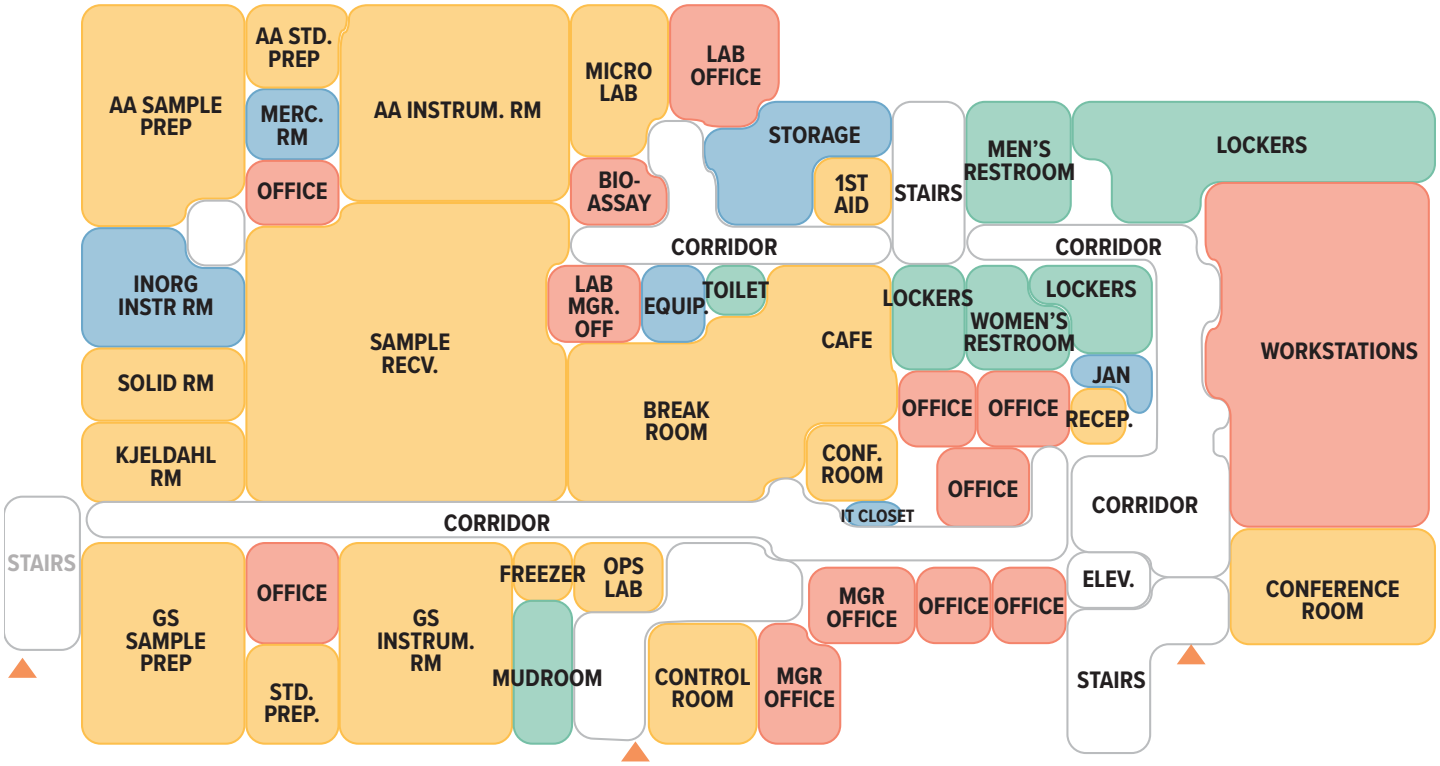



*Figure 5.1 Operations Building First Floor*

### Second Floor Program

- Meeting rooms (2)
- General offices (34)
  - CED, Finance, Human Resources, Planning and Strategy, Engineering, IT
- Workstations (9)
- Storage and support spaces

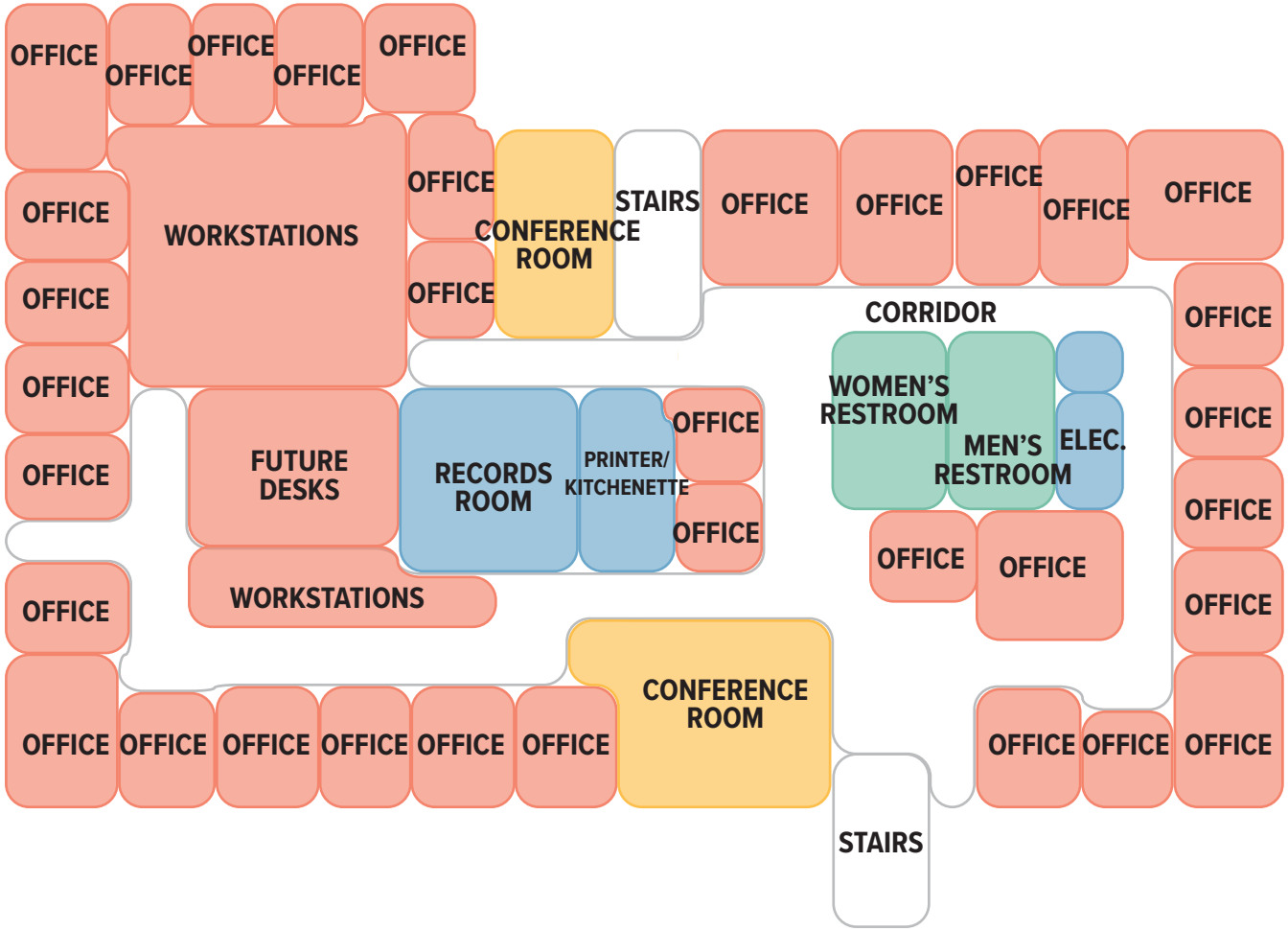



*Figure 5.2 Operations Building Second Floor*

### Lower Floor Program

- IT Server Room
- Mechanical and Electrical rooms
- Work-out room (former recycling room)
- Parking (Bicycle and Fleet vehicles)
- Storage

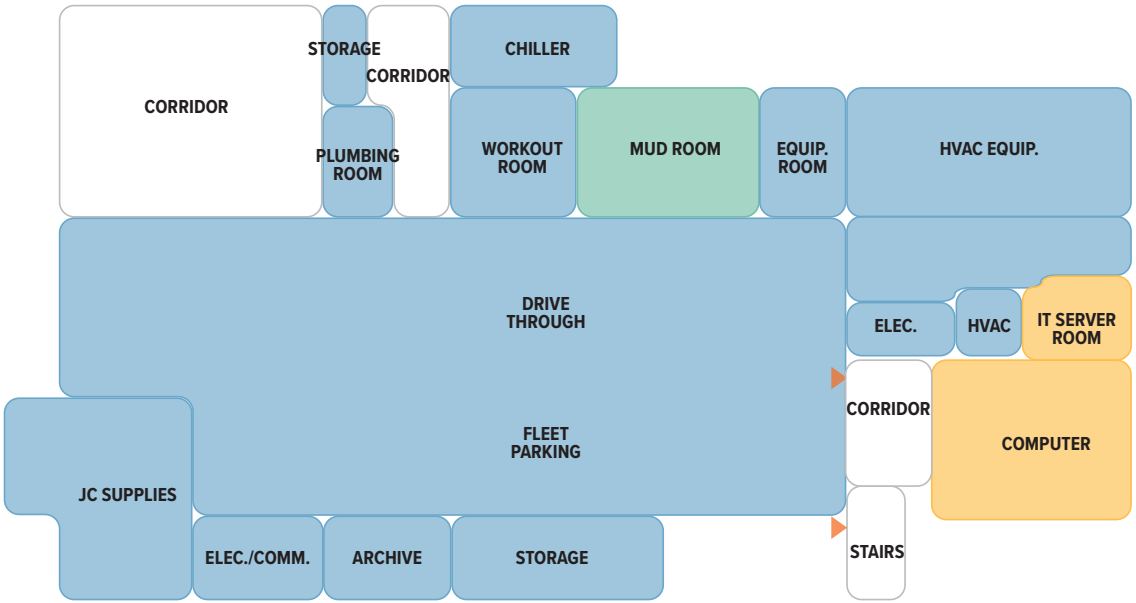



Figure 5.3 *Operations Lower Level*

### Operations Building Planning Considerations

Based on communications with District staff, user questionnaires, and site observations, the following items should be considered for workplace improvements:

- Reconfiguration of workspace and/or expansion to accommodate future staff.
  - Further analysis will be needed to determine workspace requirements for those who have the ability to work from home.
  - Multiple workgroups are interspersed with each other on second floor and new hires within second floor workgroups are assigned to spaces on first floor, hindering collaborative work environment.
  - Lab staff and Operators are tied to the Operations Building and each could function separate from other divisions/work groups.
  - District Leadership and Support staff support all district departments. They need to be accessible to all Plant staff, but are not tied to a function at the Operations building.
- Visitor and Delivery Check-in
  - Create a secure visitor and guest check-in located adjacent to predominant visitor and guest activities and along the perimeter of the plant
- Create Wellness space(s)
  - Work-out rooms
  - Mother's or Prayer rooms
  - Privacy (phone) rooms
- Expansion of lab to accommodate larger equipment
- More storage spaces
  - General office, Outreach materials
  - Chemical

## Maintenance Facility Building

**(DISTRICT BUILDING ID NO. 47)**

The Maintenance Facility Building, constructed in 2016, is a LEED (Platinum) certified building. Building staff and functions were relocated here from Shop Building No. 1 (Shop One) and Operations Building.

### Maintenance Facility Building Staff

| DEPARTMENT | FTE (2023) | Projected Staff Increase (10 years) |
|---|---|---|
| Leadership | 2 | 1-2 |
| Reliability Process | 5 | 1 |
| Facilities Maintenance | 11 | |
| Mechanical Maintenance | 10 | 1-2 |
| Electrical Maintenance | 10 | 1-2 |
| Collection Systems | 6 | 2 |
| **TOTAL** | **44** | **6-9** |

*Table 5.1 Maintenance Facility Building Staff*

### Building Function

The building serves as the main hub of maintenance functions and deliveries. The meeting/training room is the largest on the Plant campus and hosts Commission meetings. The maintenance vehicle storage bay is the largest interior gathering space and is the primary location of all-staff gatherings.

The main building entrance is on the south side of the building with deliveries arriving at the Loading Dock on the west or the Parts Storage area on the north. The mezzanine is used for parts storage and a workstation was recently added due to limited space on the first floor.

Maintenance staff begin their day at this building where they collect work orders and parts and then move on to collect needed items stored in other parts of the Plant, notably Storage Buildings No. 1 and 2 located in the northeast corner of the Plant. Staff then move to their designated work location either in the building, elsewhere in the Plant, or out in the field.

Square Footage: 50,561

### First Floor Program

- Reception area
- Meeting rooms (2): Meeting and Training (Commission meetings are held-here) and a Conference Room
- Maintenance shops: Electrical, Mechanical, Collection Systems, and Buildings and Grounds
- Receiving: parts staging, and storage
- General offices (11)
- Workstations (38)
  - Collections System (8)
  - Parts Staging and Storage (4)
  - Mechanical (11)
  - Electrical (11)
- Facilities Maintenance
- Vehicle Storage
- Storage and support spaces
- M/W Locker rooms

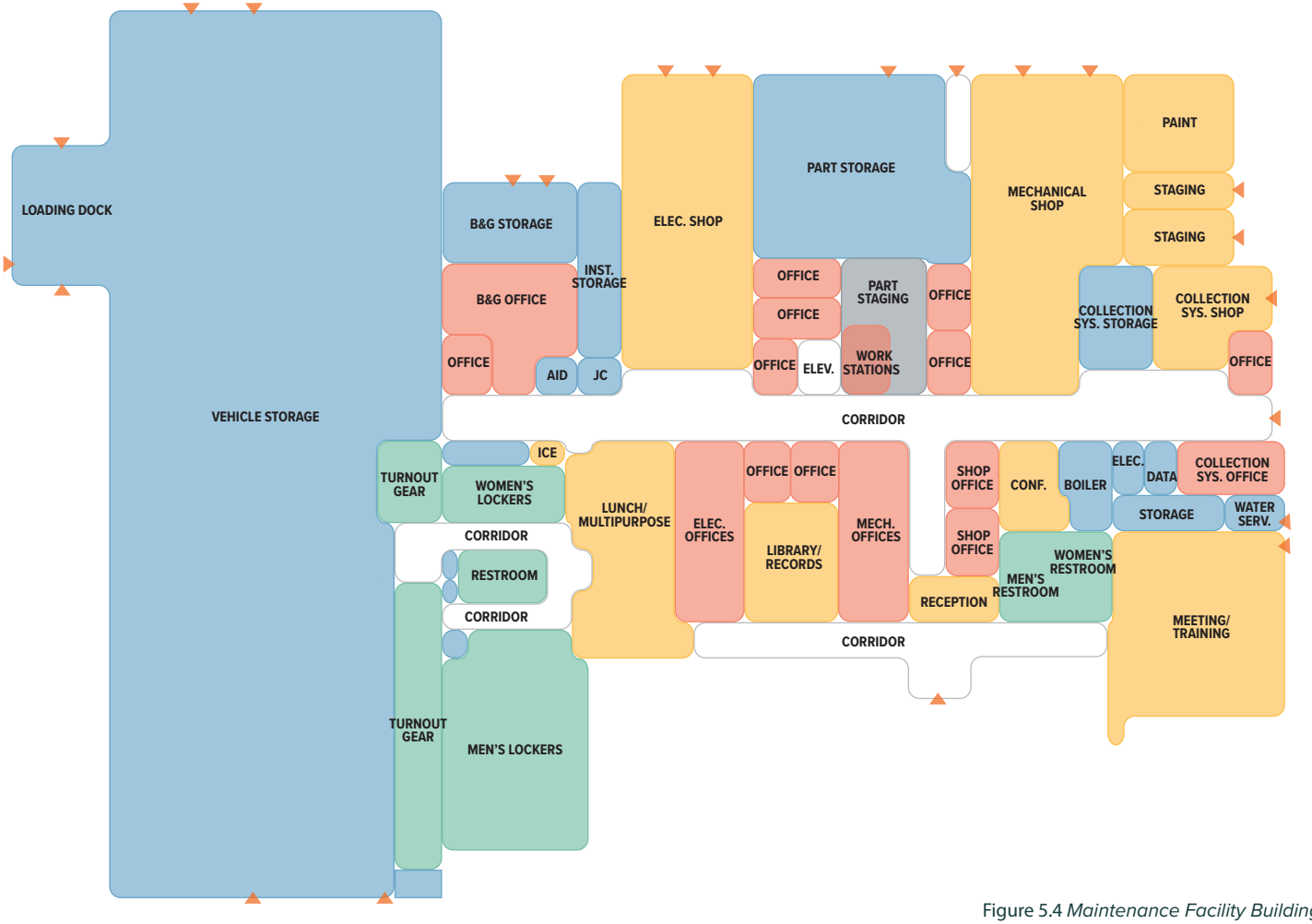



Figure 5.4 *Maintenance Facility Building First Floor*

### Mezzanine Program

- Storage
- Workstation (1)

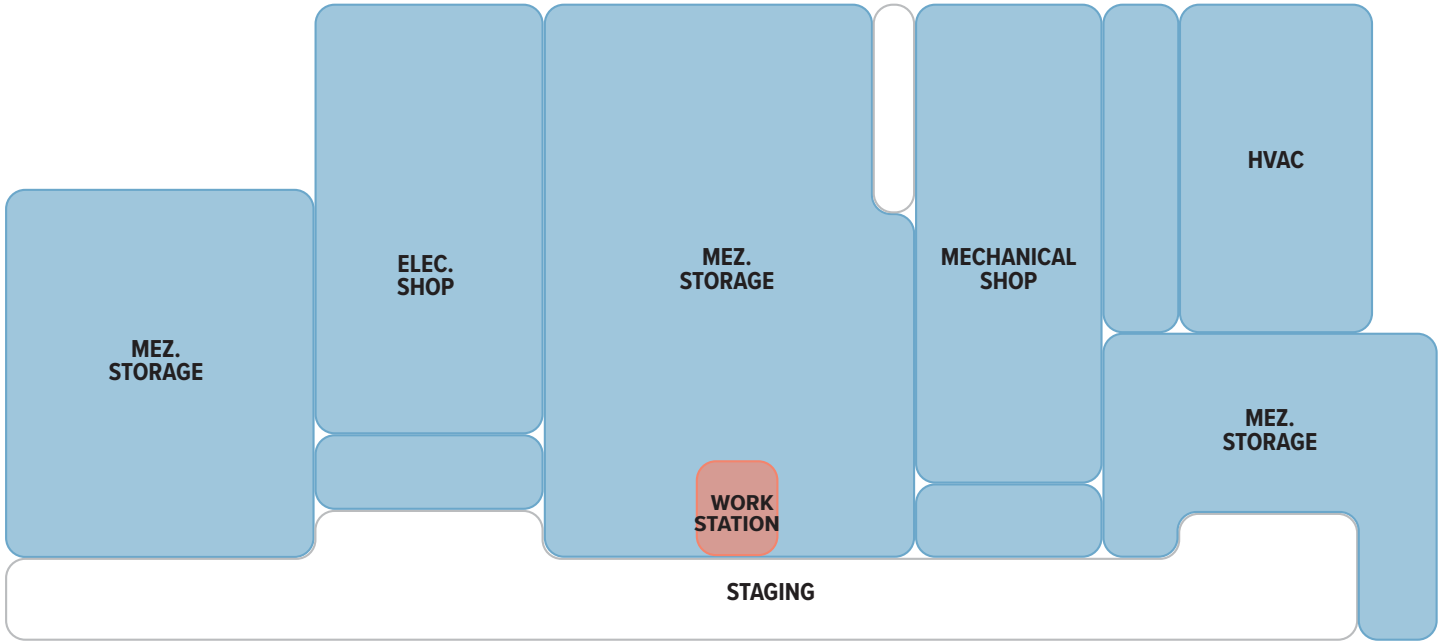



Figure 5.5 *Maintenance Facility Building Mezzanine*

### Maintenance Facility Planning Considerations

Based on communications with District staff and User Questionnaires and site observations, the following items should be considered:

- Additional storage space for all work groups
- Vehicular circulation improvements around the building
- Flexible meeting space large enough to accommodate 100+ people (partitions for smaller meeting spaces for increased functionality)
- Additional work/office spaces for staff expansion
- Wellness rooms
  - Mother's Room
  - Privacy (phone call) room
- Relocate Storage Building No. 1 and 2, and Maintenance Shop No. 2 functions adjacent to the Maintenance Facility Building
- Consolidation of all Maintenance functions, including Metrogro staff, in one location

# Vehicle Loading Building

**(DISTRICT BUILDING ID NO. 39)**

The Vehicle Loading Building was constructed during the Sixth Addition in 1979.

### Vehicle Loading Building Staff

| DEPARTMENT | FTE (2023) | Projected Staff Increase (10 years) |
|---|---|---|
| Operations and Maintenance (Metrogro) | 4 | 0 |
| Ecosystem Services | 1 | 0 |
| **TOTAL** | **5** | **0** |

Table 5.2 Vehicle Loading Building Staff

### Building Function

The building serves as a loading facility for Metrogro trucks. Metrogro facilitates the application of wastewater treatment biosolid, agricultural fertilizer. The building has two interior loading stations and a separate vehicle maintenance and wash bay. This facility works in conjunction with the exterior Metrogro Pumping Station loading facility on the western side of the Plant. Metrogro fleet is also stored here in the loading bay, wash bay, and exterior parking areas.

Square Footage: 10,595 (includes basement, does not include storage wells)

### Building Program

- Metrogro vehicle loading bay
- Maintenance and wash bay
- Offices (3)
- Workstations (2)
- Staff support space

### Planning Considerations

Based on communications with District staff and user questionnaires, the following items should be considered*:

- Additional staff office space
- Additional shop space
- Adequate interior space for Oxbo applicators and other equipment to safely maneuver
- Adequate overhead space for maintenance with crane
- Interior storage large enough for Metrogro fleet
- Consolidation of Metrogro locations
- Future site/building space needs if current function is moved

*TKDA staff did not complete a site tour of this building

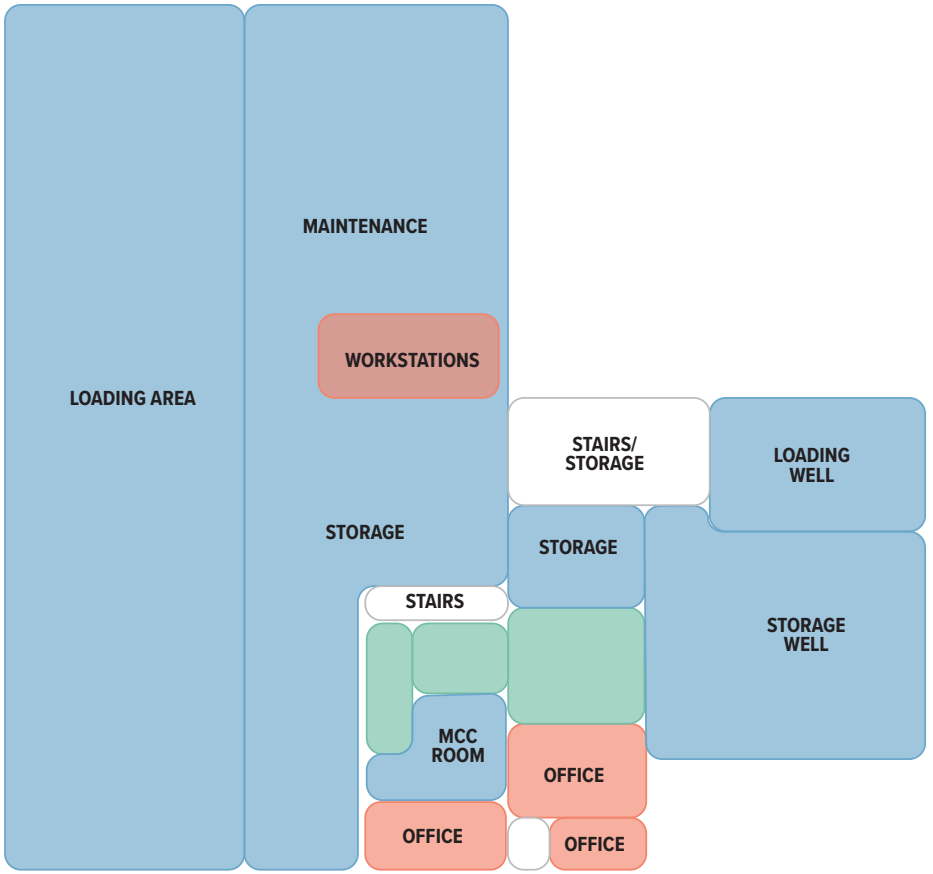



*Figure 5.6 Vehicle Loading Building*

## Maintenance Shop No. 1 — Shop One

**(DISTRICT BUILDING ID NO. 37)**

Maintenance Shop No. 1 was originally constructed as the Effluent Building in 1958 during plant expansion for Effluent discharge. The building's function was converted to a primary maintenance shop use when the new Effluent Building was constructed in 1983. All maintenance staff formerly located here were relocated to the Maintenance Facility Building in 2016, which provided an opportunity for innovative re-use initiatives for the building, including public education, outreach, and events.

This building does not house any staff.

### Building Function

The building serves as the Community Outreach hub, telling the District's story, remembering the history, and increasing public awareness of water stewardship. Plant visitors and tour groups arrive via Gate 2, which is open temporarily for the event, typically by personal vehicle or bus. Groups arriving by bus unload near the primary entrance on the east side of the building. Buses wait in the parking lot near maintenance storage buildings. Visitors and guests arriving by personal vehicle park in the small adjacent parking lot to the east or in the maintenance storage parking area to the north.

Most Plant tours start and end here. Group functions and tour orientation take place in the large gathering room.

### First Floor Program

- Large gathering room
- Workshop
- Storage
- Support spaces

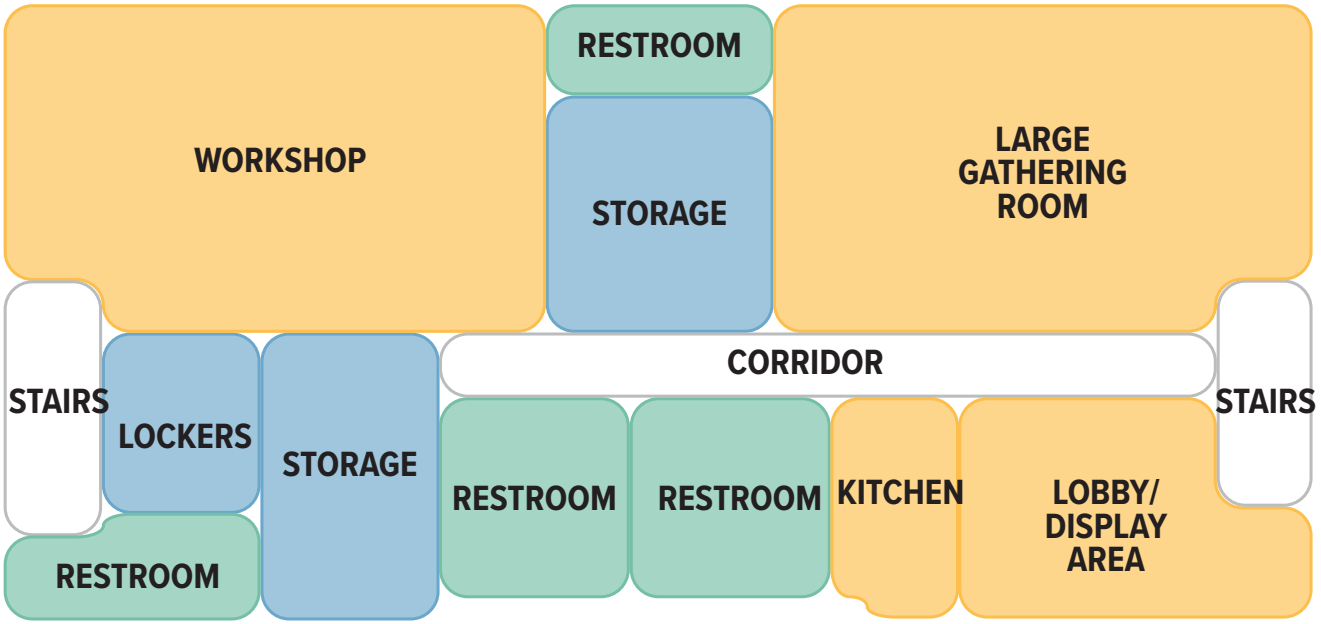



*Figure 5.7 Shop One First Floor*

### Second Floor Program

- Large gathering room
- Workshop
- Storage
- Support spaces

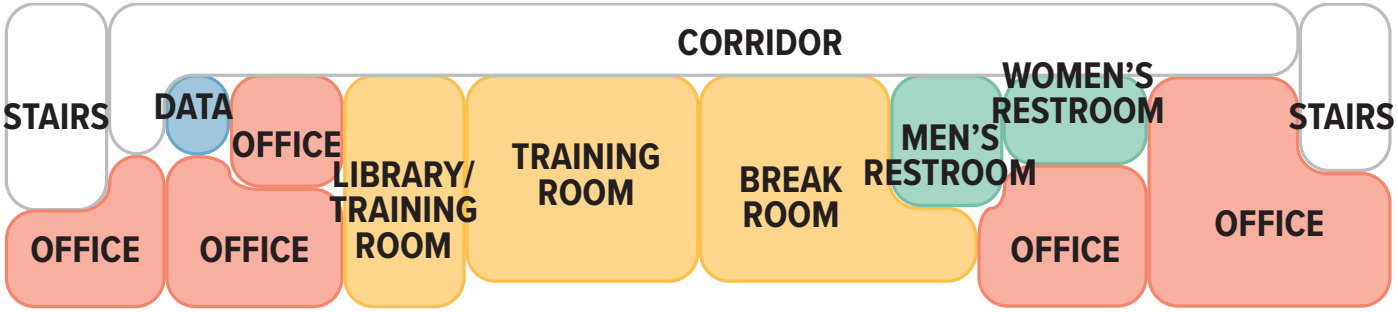



*Figure 5.8 Shop One Second Floor*

### Shop One Planning Considerations

Based on communications with District staff and Shop One Strategic Plan, the following items should be considered:

- Co-locate functions of Shop One with staffed functions
- Either in current location or in new location adjacent to staff that oversee the current programmatic functions
- Improve entrance security and visitor check-in
- Additional renovation for workspace, exhibits and displays
- Accessible access to second floor for re-use

## Headworks (District Building ID No. 2)

The Headworks building was constructed during the tenth addition in 2006. It is the first line of treatment for wastewater entering the Plant. It is also the location for septage haulers to unload sewage collected from septic tanks and portable toilets.

### Current Space Functionality

The interior space of the building contains screens and chambers to remove trash, sand, and gravel. On the exterior is a septage receiving area. This is a covered area large enough for two (2) septage hauler trucks to back in and unload via a hose from the truck to a receiving trough. The septage in the trough is piped into the building via gravity and joins the influent for treatment. The haulers provide septage samples, which are left in a refrigerator within the building. Haulers wash down their trucks and the septage area when complete.

### Planning Considerations

Based on communications with District staff and septage haulers, the following items should be considered:

- Provide additional stalls for septage receiving drive-through configuration is preferred
- Create an interior receiving area to mitigate winter icing issues
- Improve screening for septage before entering influent channels
- Provide volume metering

## General Plant Storage

### Maintenance Storage

Storage of various facilities maintenance items occurs in Storage Buildings No. 1 and 2, Maintenance Shop No. 1 (Shop One), Maintenance Shop No. 2 and the Service Building. These storage and maintenance buildings are in the northeast corner of the Plant. When the Maintenance Facility Building opened, maintenance staff relocated from Shop One to that facility, creating two separate maintenance facility areas.

### Chemical Storage

Storage of various chemicals used in wastewater treatment occurs where they are used. The Plant does not have a centralized designated chemical storage facility.

### Planning Considerations

Based on communications with District staff and site observations, the following items should be considered:

- Receive and store chemicals in one centralized location for distribution to use areas
- Chemical storage facility to be located in proximity to existing storage areas - south side of the Plant central to Biosolids End Use Building and Struvite Harvesting Building

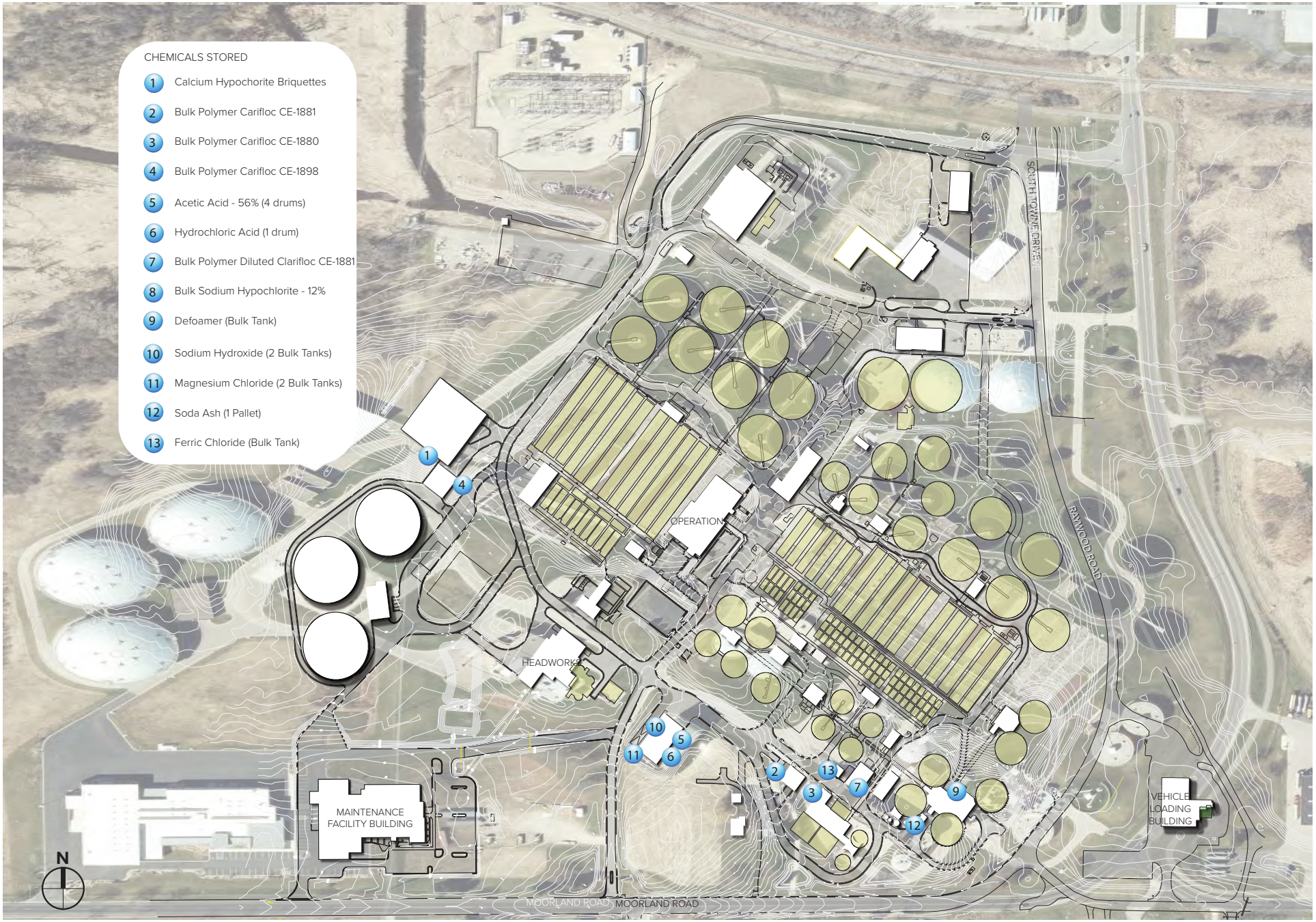



*Figure 5.9 Chemical Storage Locations*

# Chapter Six: Program and Placement Considerations

This chapter provides a description of the ten (10) identified Capital Project Infrastructure Placement projects or site considerations.

Each project or site consideration is organized by:

- CPIPP Number and Title
- Previous Plan References
- Alignment with Strategic Performance Areas
- Project or Facility Program
- Placement Considerations
- Project Benefits
- Cost (if provided)

## CPIPP 1.0 Electrical Service Upgrade and Backup Generators

*PLAN REFERENCE: 2023 CIP (Capital Improvement Program), 2020 Energy Management Master Plan*

This project replaces the outdoor service switchgear, transformers, busway system and indoor distribution switchgear for the incoming electrical service to the treatment plant and adds backup generators.

### Strategic Performance Areas

- Infrastructure Reliability

### Infrastructure Program

- Three new generators, with a potential future fourth generator (this is currently in design by Madison Gas & Electric and is subject to change)
- New switchgear
- New bus-way between Nine Springs Substation and H1 substation

### Placement Considerations

- Located between the Effluent Building and MG&E Nine Springs Substation
- Keep substation access outside of primary controlled Plant perimeter fencing

### Benefits

- Replaces and upgrades equipment coming to the end of its useful life.
- The addition of backup generators increases operational reliability.

### Cost

- $4,739,000 (per 2023 CIP)
- *$12,101,250 (per 2024 CIP)*


*Figure 6.0. Electrical Service Upgrade Location*

## CPIPP 2.0 Biosolids Improvements

*PLAN REFERENCE: 2023 CIP, 2021 Biosolids Management Plan, 2020 Energy Management Master Plan*

The operation of the Nine Springs Wastewater Treatment plant leaves significant quantities of biosolids as a byproduct. Biosolids must be disposed of in an environmentally-responsible way, while also operationally manageable and cost-effective. The District currently disposes of most biosolids in the form of class B liquid (Metrogro), applied to more than 5,000 acres of local farm fields in compliance with Department of Natural Resources regulations. This method recovers the resources in biosolids through their use as fertilizer.

The District has disposed of its biosolids through land application for many years. A 2021 Biosolids Management Plan report reviewed the program to identify needs and opportunities. The report framed its analysis around the question of what form of biosolids the District should produce. With consideration of other district priorities and no regulatory drivers, Class B liquid—the District's current product—is therefore the pathway for District biosolids for the near future.

This plan provides infrastructure placement considerations for upgrades to the existing Class B liquid product but identifies Plant area to be reserved for future considerations if a change to a cake product were to be pursued. Future space allocation considerations will defer to that alternative with the highest space need requirements. If a change is made to a cake product, the existing Metrogro storage tanks and vehicle load-out stations are no longer needed.

The report identified the following issues with equipment and infrastructure implications:

- Fleet management - Applicator and trailer limitations with current fleet size for field delivery and land application. Currently, the District's limitation is applying on 4 sites maximum due to staffing and equipment limitations.
- Inadequate and inefficient "Load out" operations - Not enough trailer loading stations, sludge transfer inefficiencies to second loading location (Vehicle Loading Building), non-standard fleet trailers and loading set ups, sludge loading piping and pump operational inefficiencies.
- Inadequate maintenance shop area - The current size of equipment and building size limitations do not allow for safe working conditions within the building and competing operations for space during hauling for emergency repair of equipment in shop.
- Inadequate fleet storage protection - Equipment stored outside and uncovered in multiple district locations (end use building, parking lots at VLB, pit property). Additionally, during cold weather hauling, trailers are parked in the maintenance facility garage over night to prevent valve and material freezing.
- Inefficient building systems due to heated loading bay, yet manual doors are left open all day. See 2020 Energy Management Master Plan, Simple Alternatives to reduce energy consumption.

### Strategic Performance Areas

- Adaptation
- Financial Sustainability
- Regulatory Compliance
- Workforce Development

## 2.1 Metrogro Load-out Improvements

Abandon load-out in the Vehicle Loading Building and consolidate from two (2) vehicle loading locations within the Plant to one location at the existing Metrogro Pumping Station to the east of Metrogro Storage Tank No.1.

### Facility Program

- Expand the existing Metrogro Load-Out Station from two (2) loading stations to six (6).

### Placement Considerations

- Expand at the existing load-out station location near the Metrogro Storage Tanks.
- Relocate Odor Control Soil Beds.
- Realign service roads 'A' and 'AB' to accommodate Metrogro hauling traffic.
- Metrogro haulers use Gate 1 for entry and exit.
- Establish a secondary perimeter of security to allow Metrogro haulers unimpeded access during operating hours.

### Cost

- $5,700,000


*Figure 6.1. Biosolids Vehicle Load Out*

## 2.2 Metrogro Storage and Maintenance Facility

Relocate Metrogro operations from Vehicle Loading Building and consolidate Metrogro fleet storage and maintenance in one facility. Co-locate Fleet maintenance (Maintenance Shop No. 2) with Metrogro maintenance.

### Facility Program

- Area: 23,500 GSF
- Footprint: 105’ x 130’
- Fleet Storage
- Wash Bay
- Maintenance Bays (4)
  - Metrogro maintenance: provide clearance for crane above applicator equipment
- Offices (5): Supervisor (1), staff (4)
- Workstations
- Machine Room
- Support spaces:
  - Break room
  - Restrooms
  - General Storage Room
  - Oil Storage Room

### Placement Considerations

Consolidate all Metrogro functions to the area adjacent to the existing Metrogro Storage Tanks and the Load-out Station to increase operational efficiency. There are two options for location of the facility.

**OPTION A**

- Located to the north of the Maintenance Facility Building.
- Utilizes slope for a potential 2-story structure.
- Fleet maintenance on the south side of the building shares the service road with the Maintenance Facility Building.
- Shared fueling station with Maintenance Facility Building.
- Metrogro equipment accesses the facility on the north side and is adjacent to the load-out stations and Pump Station.
- Offices located within the building provide direct observation of the load-out stations.

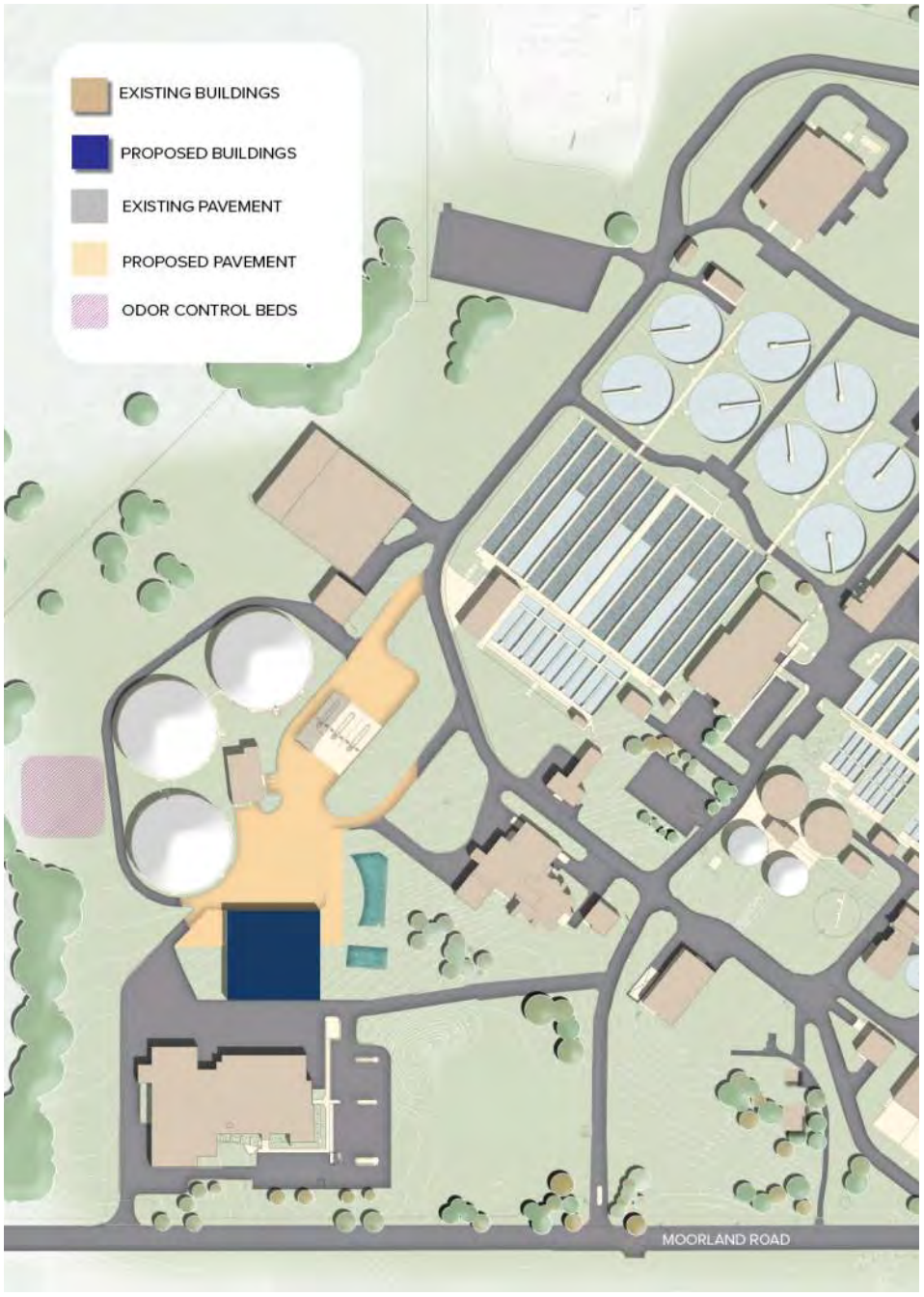



Figure 6.2. *Biosolids Metrogro*

**OPTION B**

- Located to the west of the Maintenance Facility Building and south of the Metrogro Storage Tanks.
- Extension of the service road to the west is required.
- Fleet maintenance occurs on the south side of the facility adjacent to Fleet storage in the Maintenance Facility Building.
- Service road 'AC' is reconfigured to accommodate new facility.
- Additional Metrogro fleet storage space is available to the west.

### Future Placement Considerations

- Future Biosolids expansion reserved for 5-10 acres to the west of current storage tanks.

### Benefits

- Concentration of staff and function to reduce trips within the Plant
- Improved function oversight
- Reduced vehicular conflicts within Plant
- Covered/tempered equipment storage designed for equipment maneuvering protects applicator equipment from damage/freezing temperatures and improves reliability
- Improved maintenance area for equipment improves staff safety

### Cost (Option A or B)

- $12,740,000-14,000,000

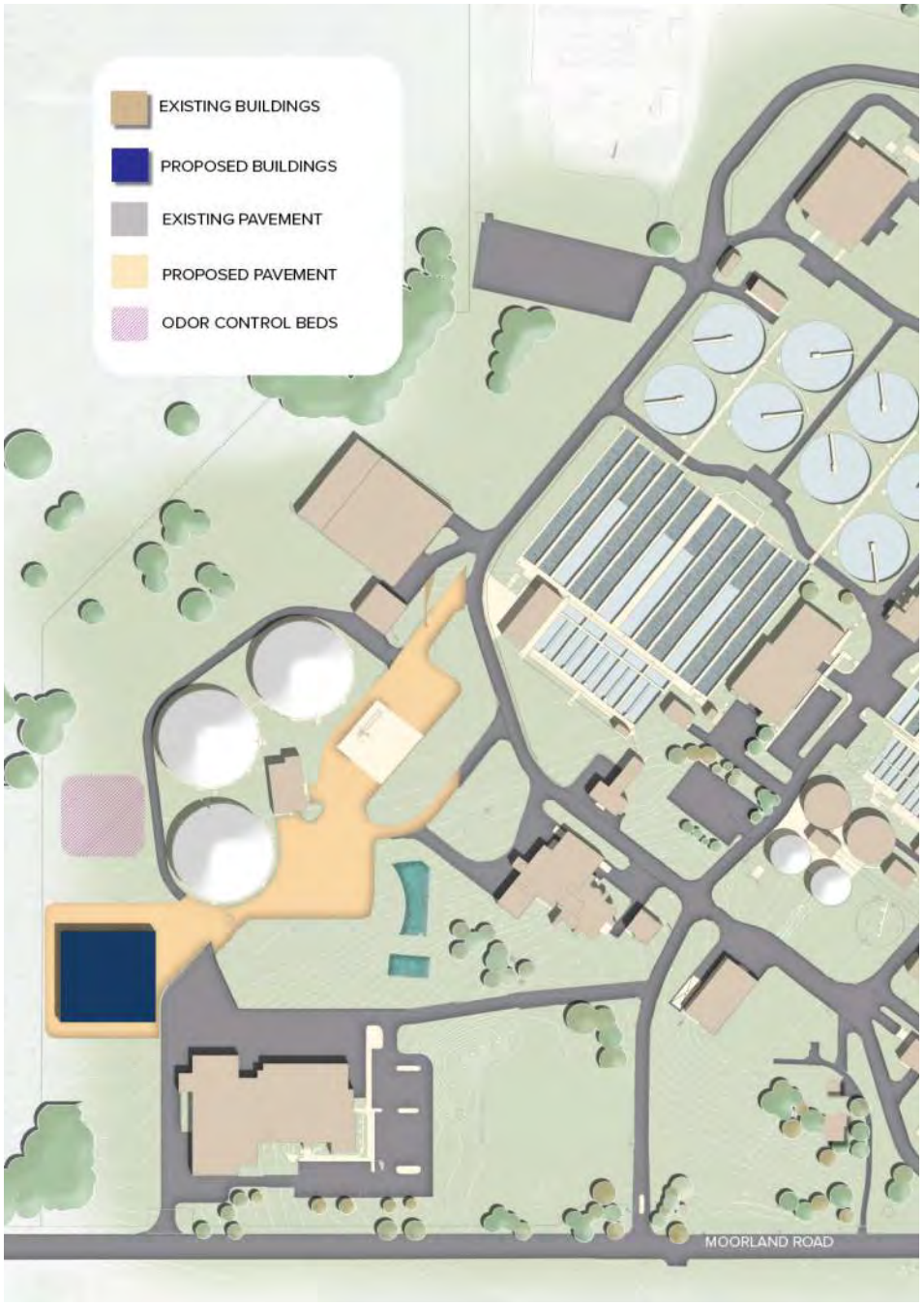



Figure 6.3. *Biosolids Metrogro*


Figure 6.4. *Biosolids Expansion*

## CPIPP 3.0 Septage Receiving Improvements

*PLAN REFERENCE: 2023 CIP, 2016 Liquid Processing Facilities Plan Table ES.04-1*

Constructed as part of the tenth addition, the Headworks facility continues to experience numerous operational and maintenance issues related to the acceptance of septage and other hauled wastes. Hauled waste receiving needs upgrades due to high maintenance costs, continued operator attention, and the potential for increased revenue with expanded unloading stations.

### Strategic Performance Areas

- Financial Sustainability
- Infrastructure Reliability
- Public Trust

### Facility Program

Construct a new stand-alone Septage Receiving facility separate from the Headworks building to include up to four (4) volume metered, drive-through unloading stations.

- Area: 2,880 GSF
- Footprint: 48’ x 60’
- Expand from two (2) to three (3) unloading stations, could expand to four (4) if space is available.
- Add volume metering.
- Covered, drive-through mechanical unloading stations.
- Support Functions: Sample drop-off and restrooms.

### Placement Consideration

It is recommended to locate the Septage Receiving facility upstream, but in proximity to the Headworks building. Gravity flow to Headworks is preferred, but Septage could be piped via forcemain. Septage hauler traffic should be located outside the primary Plant security fence for unimpeded access during operating hours and to keep haulers outside of the primary Plant process area.

**OPTION A**

- Situated between the Headworks building and Metrogro storage tanks.
- Shares access with Metrogro Haulers via Gate 1.
- Reconfigure roadways to allow for drive-through unloading.

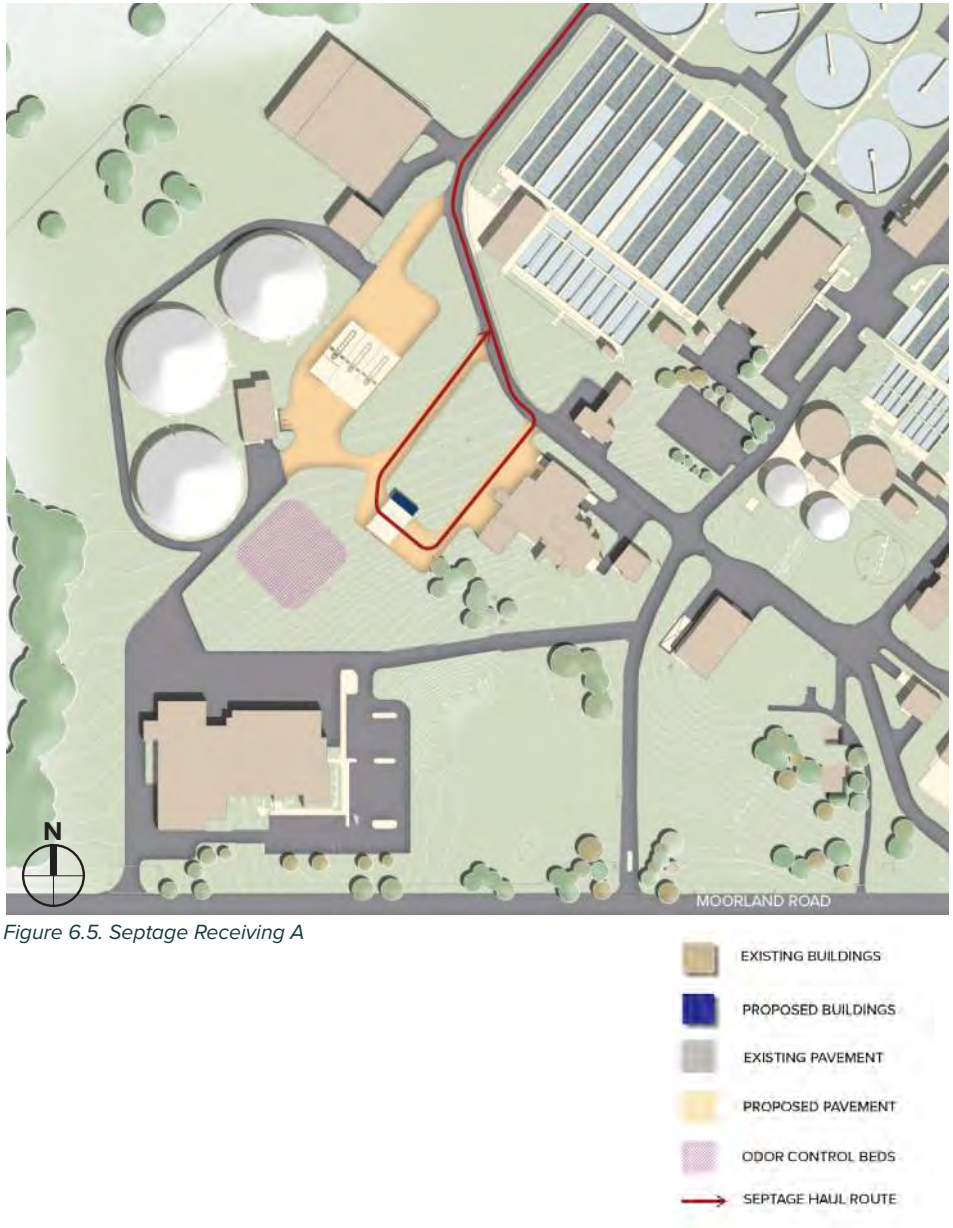



*Figure 6.5. Septage Receiving A*

**OPTION B**

- Situated to the east of the Maintenance Facility Building.
- Haulers enter the Plant through an improved Gate 3 on Moorland Road and immediately turn right into the Septage Receiving Facility. Haulers can drive through and either exit via Gate 3 or exit via a dedicated exit on Moorland Road.

### Benefits

- Reduced maintenance
- Operator oversight efficiencies
- Increase revenue by tracking discharge volumes and loadings more accurately
- Stand-alone facility would not interrupt current Septage Receiving operations
- Allows for future expansion into a High-Strength Waste (HSW) or fat, oil, and grease (FOG) facility

### Cost (Option A or B)

- $4,010,000-5,000,000

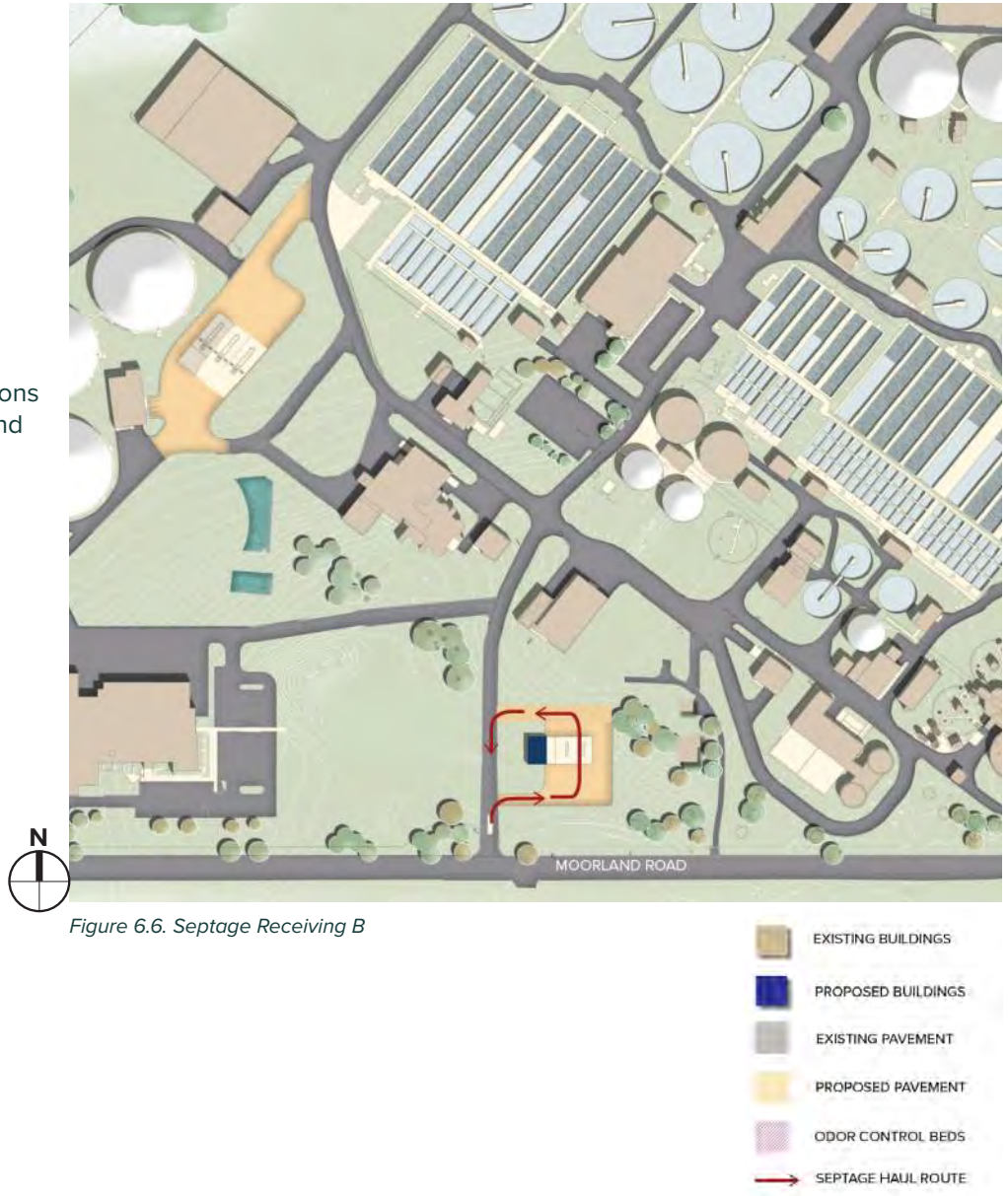



*Figure 6.6. Septage Receiving B*

## CPIPP 4.0 Heat and Power Improvements

*PLAN REFERENCE: 2023 CIP, 2021 Biosolids Management Plan, 2020 Energy Master Plan*

Potential power improvements include either cogeneration or biogas pipeline injection. A determination on the best path forward for the District requires additional study. This plan provides infrastructure placement considerations for both options.

### Strategic Performance Areas

- Adaptation
- Financial Sustainability
- Infrastructure Reliability

### Program and Placement Considerations

- Program not defined due to additional study needed.
- Cogeneration may need 6,600 SF or the equivalent of the current Gas Skid and Sludge Control Building No. 2 footprint (120' x 55').
- Biogas injection program to-be-determined.
- Cogeneration improvements should be located near existing power generation facilities (Sludge control and Boiler buildings) and in conjunction with heat loop improvements.
- Biogas injection infrastructure does not have identified placement constraints. Based on existing treatment plant infrastructure, preferred locations are either on the east side of plant near solids processing or to the south of the MG&E (Madison Gas and Electric) substation.
- Biogas injection will require a gas pipeline connection to gas utility provider services.

### Benefits

- Increase infrastructure reliability

### Cost

- $50,910,000 (per 2023 CIP)

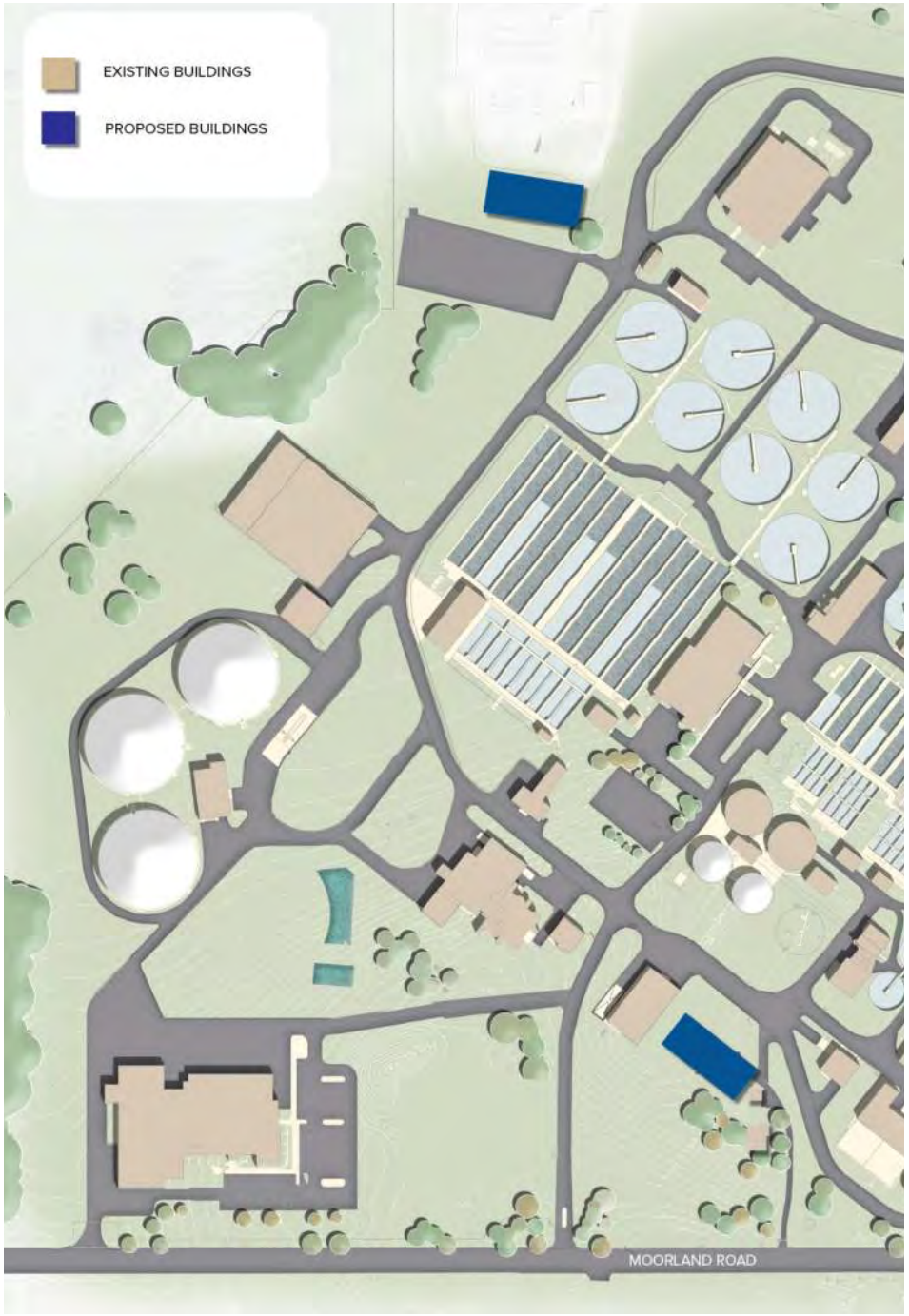



Figure 6.7 *Heat and Power Improvements*

## CPIPP 5.0 Liquid Processing Phase 2

*PLAN REFERENCE: 2016 Liquid Processing Facilities Plan –Table ES 04-1*

Improvements to the liquid processing equipment for variable oxygen level delivery and treatment (low DO). Replacing existing east and west blowers, and electrical switchgears. There may be a need to expand the West Blower Building to accommodate new blower equipment.

### Strategic Performance Areas

- Infrastructure Reliability

### Program and Placement Considerations

- Potential expansion has not been studied for size requirements or determination of need.
- Reserve space directly adjacent to West Blower Building for expansion.

### Benefits

- Increase infrastructure reliability
- Reduce energy demand

### Cost

- $43,900,000  (per CIP 2024)
  - EPIC-$1.3M
  - Low DO Partial Plant-$3.6M
  - Low DO Full Plant-$19M
  - West Blowers & SG - $10M
  - East Blowers & SG - $10M


Figure 6.8. *Liquid Processing*

## CPIPP 6.0 Campus Security/Safety Improvements

*PLAN REFERENCE: 2019 Department of Homeland Security, Infrastructure Survey Security & Resilience Report*

Currently, there are no measures to control or limit access to the Plant during normal operating hours. The Plant property is fenced and gated at the five entrances, with two of the gates left open during operating hours allowing free access to the Plant. It is advised to control access to only those personnel with a valid purpose or function on-site. This may have an impact on the location of staff functions that greet and check-in visitors, locations for sample drop-off, or for those who interact with visiting or volunteer personnel on a frequent basis. This also impacts overall Plant public image, with a clear delineation of public vs. Plant-specific functions. Once security improvements identify primary and secondary access control points, site circulation improvements should be done to separate modes of traffic and reduce internal Plant circulation conflicts.

### Strategic Performance Areas

- Infrastructure Reliability
- Public Trust
- Workforce Development

## CPIPP 6.1 Access Control/Adminstrative Building

Facility for public reception and control measures for primary and secondary entrances to increase the District's Protective Measure Index score for physical security as assessed by the Department of Homeland Security. Due to the limited expansion potential of the current Operations building, it is recommended to relocate existing functions to a new Administration Building to allow space for core Operations function expansion.

### Facility Program

Main reception of visitors and public point of entry. Houses public functions such as education and interpretation, meetings, and events.

- Area: 30,800 GSF
- Footprint: 140' x 160' (@ max size)
- Staff functions:  Could include, CED, Communications and Resource Team, Finance, HR, Ecosystems Services
  - Staff FTE: 18 - 30
- Offices
  - CED office (1)
  - Director's office (1)
  - Manager's offices (3)
  - Supervisor's office
  - Standard offices (14)
  - Future offices (8-10)

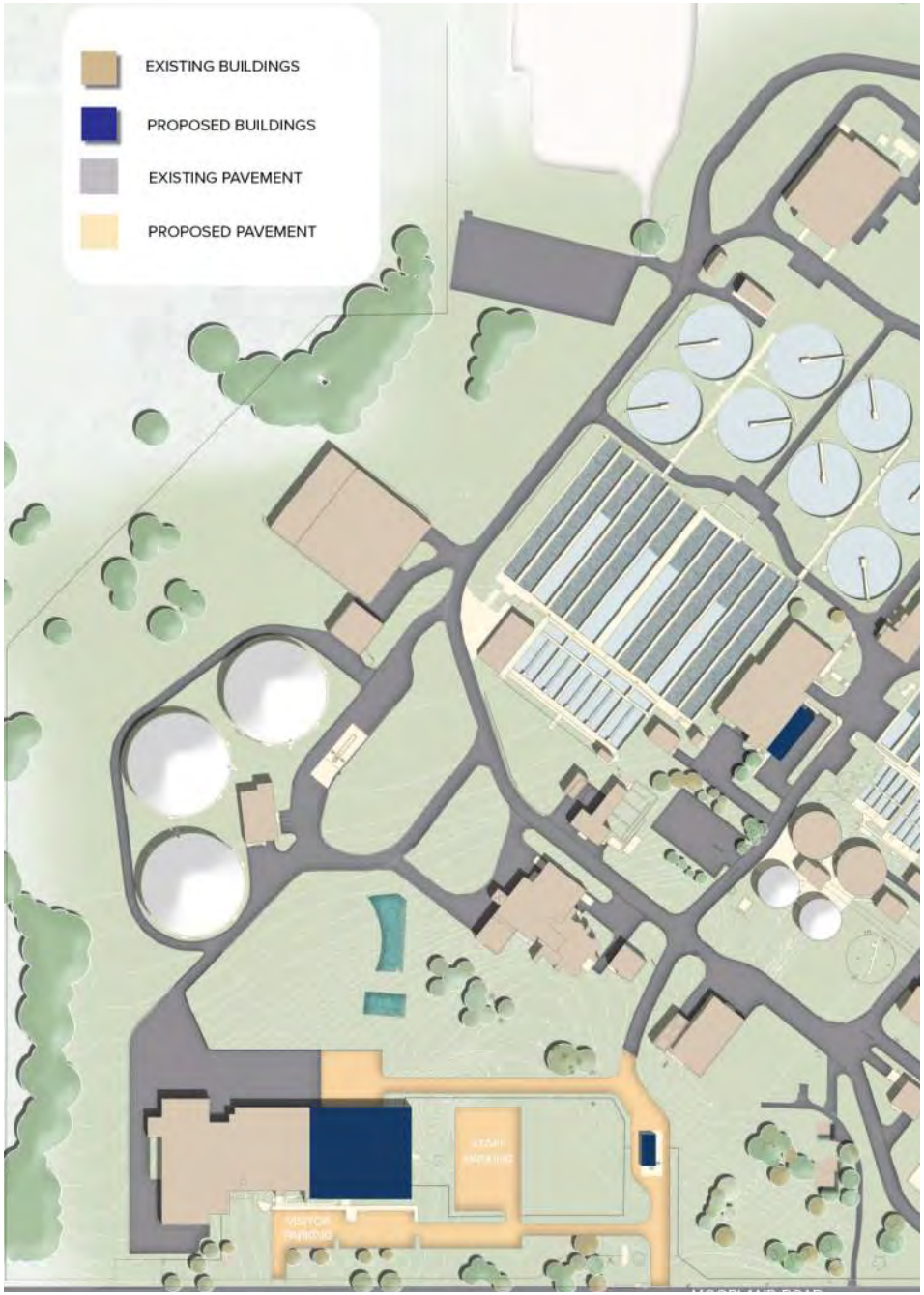



Figure 6.9. *Campus Security & Admin*

- Meeting Rooms
  - Executive conference room
  - Commission room
    - Programmed for (9 commissioners + staff + audience members)
    - Upgraded IT and A/V equipment
    - Locate for flexible use by staff for other District meetings
  - All-staff meeting room (conversion of smaller meeting spaces to one large space)
  - Public Education and Tour Gathering
- Interpretive exhibit space
  - Gathering space to start and end tours for groups up to 120
  - Consider stacked functionality to accommodate an all-staff meeting
- Support Space
  - Toilet rooms
  - Employee break room with kitchenette
  - Wellness room
- Storage
  - Library and archive storage (from Shop One)
  - Records storage
  - Program storage
  - Marketing storage
- General (Resource Team)
- Controlled Plant Access Gate
  - Security building, 8’ x 10’

### Placement Considerations

- It is recommended to create a Plant ‘Hub’ by expanding the Maintenance Facility building to the west for administrative functions.
- This creates a visible public entry due to its location along the Plant's perimeter near Moorland Road.
- Realign Gate 3 entrance to the east to align with neighborhood street and create a primary entry into the Plant for visitors, employees, and deliveries.
- Visitor parking is located to the south of the building along Moorland Road, outside of a controlled perimeter fence.
- Employees and deliveries enter the Plant through a controlled access gate.
- Access Control/Fencing
  - A Primary perimeter fence will encompass primary Plant functions and establish around-the-clock controlled gate access.
  - A Secondary perimeter fence allows Metrogro and Septage Hauler access to their facilities without gate control during operating hours. Employee parking could also be within a secondary perimeter fence to reduce traffic flow through controlled access points.
  - Remove residential home to reduce Plant liability and reserve for future Plant functions.

### Cost

- $19,400,000-22,500,000 (assume LEED certification)

## CPIPP 6.2 Site Circulation

Improve internal Plant circulation routes to mitigate conflict areas and provide separate facilities for pedestrians and bicyclists where appropriate. This may be done with CPIPP 6.1 or with other CPIPP projects needing circulation improvements or changes.

- Pedestrian and bicycle
  - Separate pedestrian and bicycle circulation from vehicular in areas of high traffic
  - Connect to the Capital City Trail
  - Connect to the bus stop On Moorland Road
  - Reduce need to cross Raywood Road or Moorland Road to service Plant functions
  - Reduce internal Plant vehicular circulation. Free up roadways for pedestrians and bicyclists
  - Promote walking by locating staff functions near each other
- Vehicular
  - In conjunction with CPIPP 2.0 and 3.0, modify heavy vehicle circulation routes to reduce overall conflicts and remove blind spots
    - Control delivery access – See CPIPP 6.1
    - Increase roadway width to a minimum of 12’ drive lanes on heavy truck routes, such as Metrogro and Septage receiving haul routes
    - Improve internal intersections for safe passage and improve visibility
- Wayfinding
  - Name internal Plant streets and install street signs
  - Add wayfinding signage at intersections, parking lots, and all publicly accessed facilities

### Cost

- $460,000 - 600,000

### Benefits

  - Protect Plant assets
  - Protect the public and staff

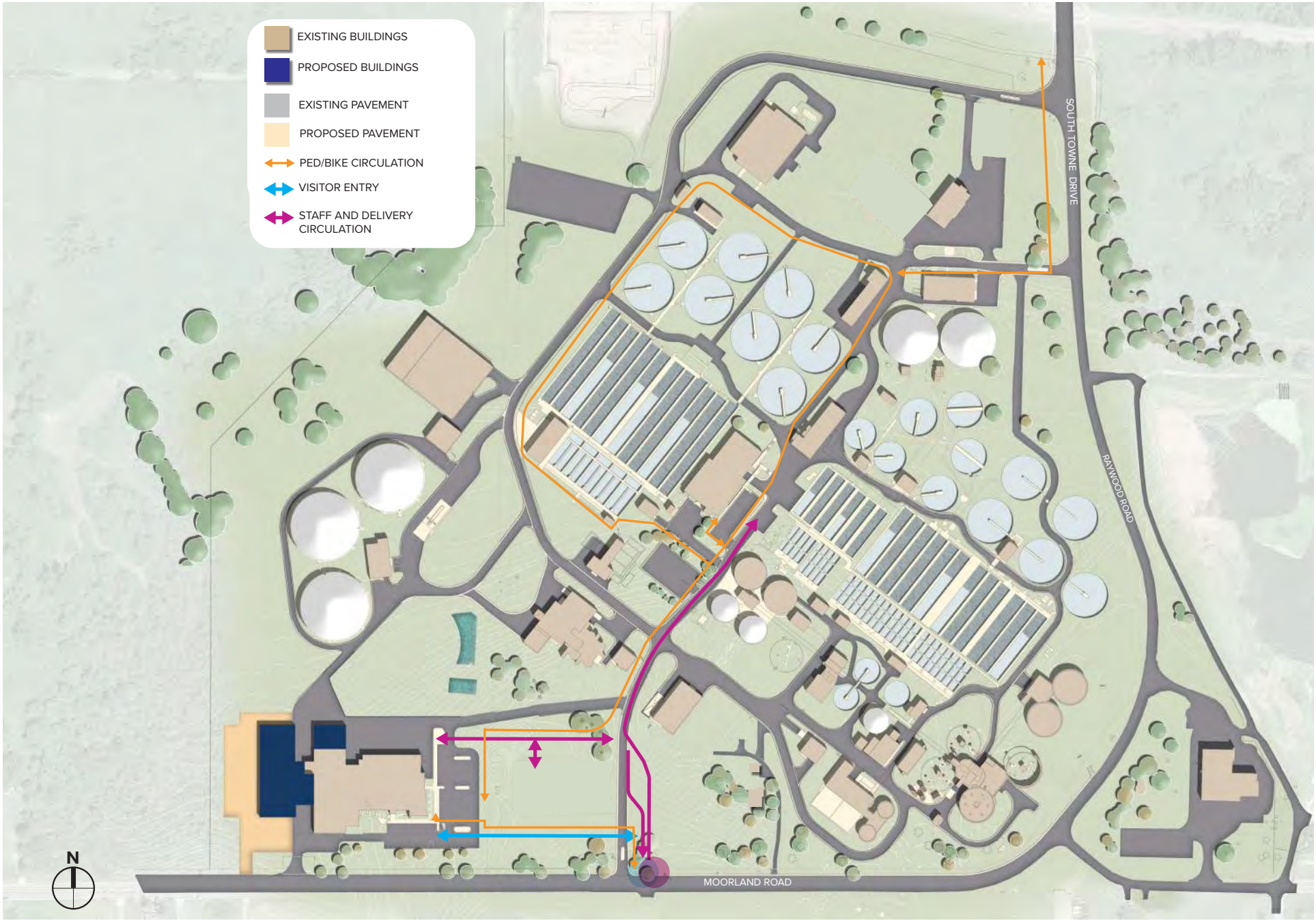



Figure 6.10. *Site Circulation*

## CPIPP 7.0 General Workplace Improvements

The workspace for maintenance staff was expanded and improved when the Maintenance Facility Building opened in 2016. Staff workspaces have recently been added to the parts storage area and the central mezzanine storage area. Staff expansion is limited.

A portion of the first floor of the Operations Building was renovated in 2020, yet there is demand for space for new staff, particularly flexible space for interns, variable employees (seasonal), and those that may choose to work hybrid. Both the Operations and Maintenance Facility Buildings lack employee support facilities such as wellness and privacy spaces, and an appropriate work-out space. Both buildings need upgraded meeting spaces (A/V technology), particularly one large enough to host all-plant meetings. Storage space is disjointed and limited in the Operations building and is at capacity in the Maintenance Facility building.

### Strategic Performance Areas

- Adaptation
- Workforce Development

## CPIPP 7.1 Operations Building

With the relocation of certain work groups to a new Administrative Building (CPIPP 6.1), this creates an opportunity to renovate the second floor of the Operations Building for remaining staff, and consideration of space for a lab expansion on the first floor.

### Facility Program

- Administrative/Business services functions relocated to new Administrative Building–see CPIPP 6.1
- Projected future additional staff in remaining work groups: 5-11 FTE (Full-time Equivalent)
- Lab expansion (future)
  - Lab expansion (excluding offices) will require either building expansion to the south or east or an expansion into the existing break room.
  - Expansion of Lab office or personnel space could be accommodated on either the north side of the first floor or on the second floor as other staff functions are relocated.
- Privacy and wellness spaces
  - Provide at a minimum 1 privacy/phone room on the second floor for those that do not have a private office
  - Workout room: locate next to locker rooms on first floor
  - Wellness/mother's room: provide 1 per floor
- Storage areas
  - Remove various closets and consolidate storage on second floor
  - Recapture space currently used for workout room on lower level as storage.
  - Secure chemical storage for lab
- Additional lockers/showers: not required if a portion of staffing is relocated

### Cost

- $8,720,000 - $10,000,000

## CPIPP 7.2 Maintenance Facility Building

Renovation and expansion to accommodate functions currently housed in Storage Buildings No.1 and 2, and Maintenance Shop No. 2. Relocation of inventory functions to allow for staff expansion and expand parts storage and staging areas.

### Facility Program

- Expanded staff workspace
  - 450 SF to accommodate 3-7 new staff
  - Relocate Inventory functions (parts storage, staging, and offices) to a new receiving and warehouse facility next to the Maintenance Facility.
  - Relocation of parts storage and staging allows existing space to be renovated for additional staff work areas.
- Storage and Receiving Expansion: Consolidation and centralization of maintenance inventory and equipment in one location.
  - Area: 19,000 GSF
  - Footprint: 160' x 200' (max.)
  - Upgrade the loading dock area
  - Offices (4)
  - Restrooms
  - Consolidate the following storage areas
    - Storage Building No.1
    - Storage Building No.2
    - Tool and Equipment storage and staging
    - Parts receiving, storage, and staging
  - General warehouse storage for Plant supplies (janitorial, office)
  - Chemical and hazardous materials storage
  - Program specific vehicle storage (forklift, pallet trucks, plant delivery vehicles, etc.)
  - Secured storage for critical inventory
- Fleet Storage Expansion
  - Expand interior fleet storage to the north of existing fleet storage
  - Expand area for exterior fleet parking
  - Expand green infrastructure for electric fleet vehicles

## Cost

- $9,330,000 - $10,300,000

## Benefits

- Increase employee satisfaction and wellness
- Adapt to changing workforce needs
- Improve workplace safety with appropriate storage facilities, particularly chemical storage
- Improves ability to track inventory
- Address fleet circulation and delivery access around the Maintenance Facility Building
- Provides opportunity for reconfiguration of spaces to accommodate relocation of parts storage and staging

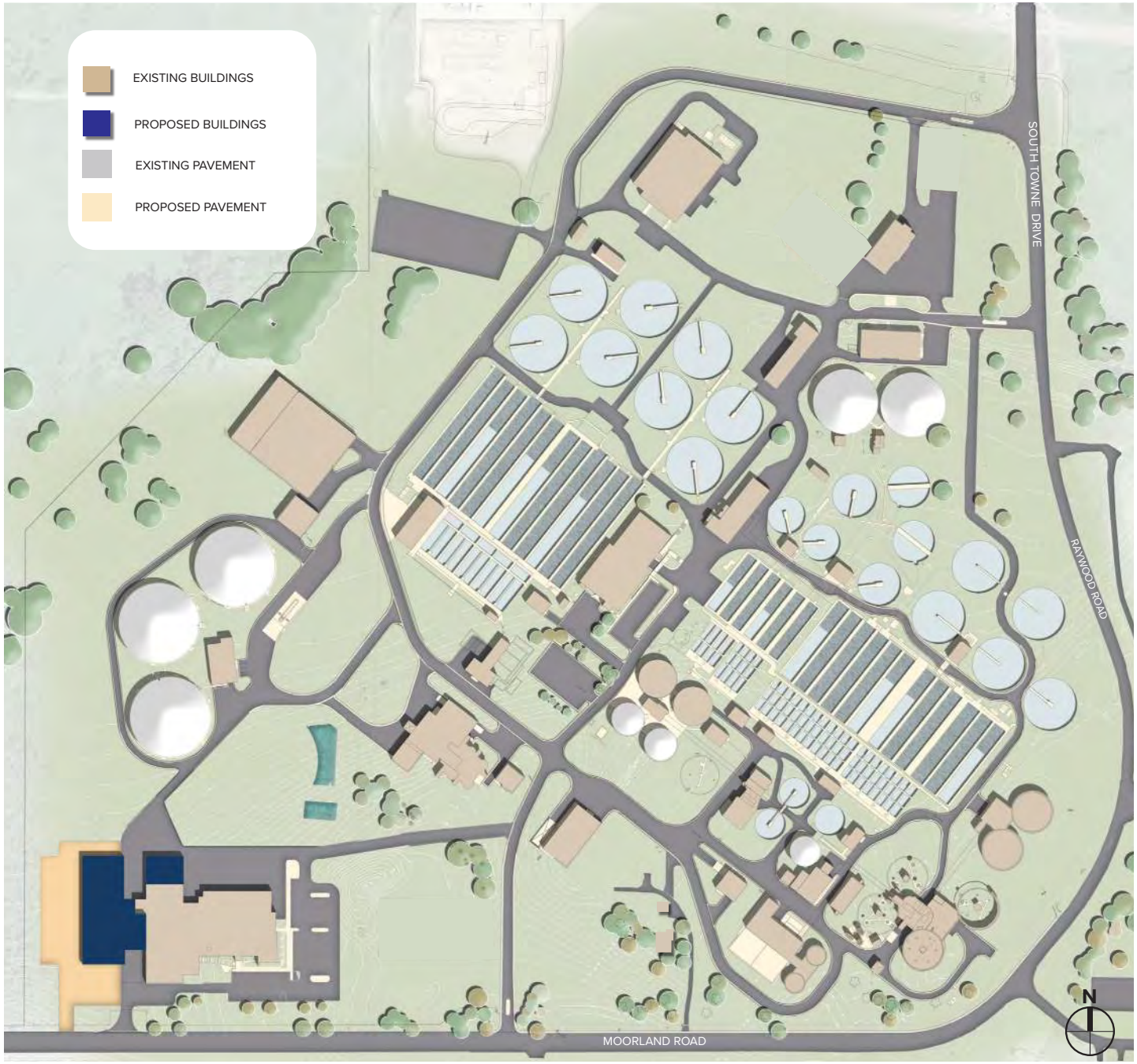



*Figure 6.11. Maintenance Storage*

## CPIPP 8.0 Plant Expansion and Tertiary Treatment

*Plan Reference: 2016 Liquid Processing Facilities Plan, 2012 Preliminary Nutrient Removal Cost Estimates Study*

Due to the potential for more stringent regulatory requirements on nutrient discharge levels to Badfish Creek, Badger Mill Creek, and Rock River ecosystems, additional wastewater treatment may be required. The 2012 Preliminary Nutrient Removal Cost Estimates Study developed alternatives to meet potential new phosphorus and nitrogen discharge limits to these receiving waters. This may be accomplished by expanding secondary treatment facilities by increasing aeration tank volume, adding 2 clarifiers, and associated blower building, methanol storage, and feed facility in addition to tertiary treatment or the addition of a new membrane bioreactor (MBR) and a metal salt feed point.

Tertiary treatment adds a third, more advanced and rigorous level of nutrient treatment to the current Plant wastewater treatment process.

### Strategic Performance Areas

- Adaptation
- Public Trust
- Regulatory Compliance

### Program and Placement Considerations

- Secondary Treatment Expansion
  - Conservative estimate of space needs is 10-15 acres
  - Located to the west of Biosolids End-use Building, extending to the western Plant boundary
  - Expansion to the northwest is limited due to wetlands
- Tertiary Treatment I
  - Located to the east of the Effluent building
  - Requires removal of Storage Building No.1

### Benefits

- Increased treatment capacity
- Reduction of nutrient loads for environmental and public health protection


*Figure 6.12. Plant Expansion*

## CPIPP 9.0 Plant-wide Stormwater System

Due to the time of Plant installation and expansion, stormwater best management practices have only recently been implemented, most notably the Maintenance Facility Building (2016) as a requirement of City of Madiosn stormwater management requirements for development. During the planning process for the Capital Infrastructure Placement Plan, it was identified during the site analysis process that the District predominantly manages stormwater via overland flow to storm sewer pipes. A portion of the stormwater captured on-site is diverted to discharge within the wastewater treatment process.

Stormwater not discharged into the wastewater treatment is directed to a large stormwater pipe running west-east along the Gate 2 service road and discharges into a small creek east of South Towne Drive which joins with Nine Springs Creek. Limited volume control and water-quality treatment can increase flooding, cause erosion, increase pollutants and sedimentation in receiving waters.

With the eventual incorporation of the Nine Springs Wastewater Treatment Plant into the City of Madison and the availability of space due to the relocation of storage functions, a plant-wide stormwater management facility is recommended. Since 2016, the City of Madison has experienced many extreme storm events which elevate lake levels and can result in flooding of low-lying areas. Because of the Plant's location along the Nine Springs E-Way, and the nature of the District's business to protect the health of the surrounding environment, it is important for the District to consider ways to effectively manage stormwater not only for existing conditions, but in planning for future projects.

### Strategic Performance Areas

- Adaptation
- Infrastructure Reliability
- Public Trust
- Regulatory Compliance

### Facility Program

- Volume retained: 15 ac-ft
- Surface Area: 2.5 acres
- Storm Event: 10-year stored on-site
- Pretreatment at the source for each new impervious area or building, integrate stormwater management into the overall Plant landscape

### Placement Considerations

- Along existing drainage patterns and low areas
- Northeastern corner of the Plant in the vicinity of Storage Buildings No.1 and 2, and Maintenance Shop No.2
- Between Effluent Storage Reservoir No.2 and Raywood Road

### Benefits

- Improved Flood Control: A plant-wide system can help manage stormwater runoff by channeling it into designated storage and retention facilities. This can help prevent flooding and reduce property damage during heavy rain events.
- Water Quality Improvement: Stormwater runoff can carry pollutants like oil, trash, and bacteria into local waterways, harming aquatic ecosystems and posing a risk to public health. A plant-wide system can incorporate treatment measures like sedimentation basins and vegetated swales to help remove these pollutants and improve water quality.
- Cost Savings: Building and maintaining individual stormwater systems for each property or development can be expensive. A plant-wide system allows for shared costs between projects, or the cost is already encumbered due to upsizing of system when installed.
- Conservation of Natural Areas: By managing stormwater runoff through green infrastructure, like rain gardens and bioswales, a plant-wide system can help preserve natural areas and wildlife habitat.
- Community Resilience: A plant-wide stormwater system can enhance community resilience by providing a reliable and resilient system for stormwater management. This can help reduce the impact of extreme weather events and improve public safety.

### Cost

- $2,180,000


Figure 6.13. *Stormwater*

## CPIPP 10.0 Solids Digestion Expansion

*PLAN REFERENCE: 2020 Energy Management Master Plan*

There are many future scenarios that lead to expanded treatment and resource recovery. To accommodate more organic solids processing, high-strength waste (HSW), and increases in accepted waste for energy production, an expansion of digesters and solids digestion technology is possible.

The proposed vacation of Metrogro functions in the current Vehicle Loading Building (VLB) location provides an opportunity to expand the Plant to the east but requires relocation of Raywood Road. Historically, Raywood Road was realigned to the east to accommodate Plant expansion in the late 1970's.

Raywood Road relocation would allow incorporation of 4-4.5 acres within the main plant area. The additional land would provide the ability to expand digesters, add an HSW receiving facility (ideally located near the digesters), or the addition of co-generation facilities. It was noted that during the development of the 2020 Energy Management Master Plan process that electrical energy use has shown to hold relative steady (2007–2019) with on-site electrical generation gradually increasing (up to system capacity limitations), while purchased electricity has gradually decreased. This suggests the District has already begun an upward trend toward energy independence, but there exists room for expansion. Consolidation of land east of the digesters is integral to expansion of energy production on-site to add digester capacity.

This also aligns with Plant initiatives for improved security by containing all Plant functions within a contiguous area and decreasing the staff time needed to monitor plant functions. Relocation of the roadway would also address traffic concerns at Moorland Road/Raywood Road intersection and realign Capital City Trail to avoid conflicts with Plant functions.

The project's purpose is to realign Raywood Road to the east and install a new intersection of Raywood Road and Moorland Drive, potentially designed as a roundabout. Existing alignment of Raywood Road has a T-intersection with Moorland Road, known for crashes due to the limited sight lines along the sweeping curve of Raywood Road. Realigning the roadway to the east would allow the installation of a new roundabout intersection which have been shown to drastically reduce fatal and injury related crashes.

[1] 2020 Energy Management Master Plan. ES.3. Page 18.

### Strategic Performance Areas

- Financial sustainability
- Infrastructure Reliability
- Public Trust
- Regulatory Compliance

### Program and Placement Considerations

- Realign Raywood Road to the east
- Realign Raywood Road and Moorland Road intersection, add a round-about
- Additional 4-4.5 acres captured within contiguous Plant area
- Area could accommodate additional digesters and a High Strength Waste Facility
  - An option for a stand-alone High Strength Waste Facility

### Benefits

- Addresses safety issues at the intersection of Raywood Road and Moorland Road
- Improves ability to secure and monitor critical plant operations.
- Provides approximately 4 acres to expand digesters, add high strength waste receiving, or the addition of co-generation facilities
- Opportunity to increase biogas production

### Cost

- $4,840,000 (Raywood Road Realignment only)

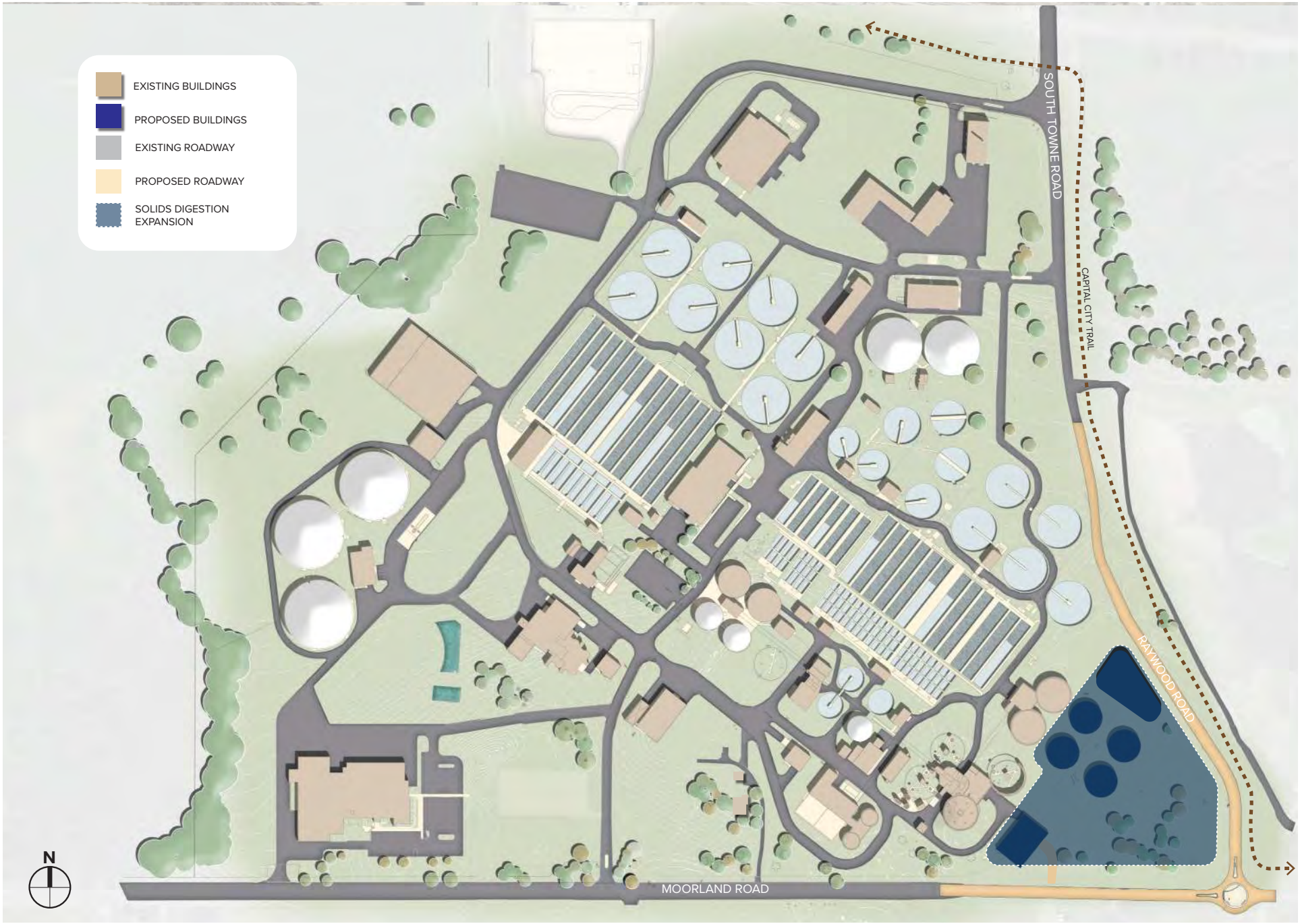



*Figure 6.14 Solids Digestion Expansion*


*Figure 6.15 Proposed Land Use*

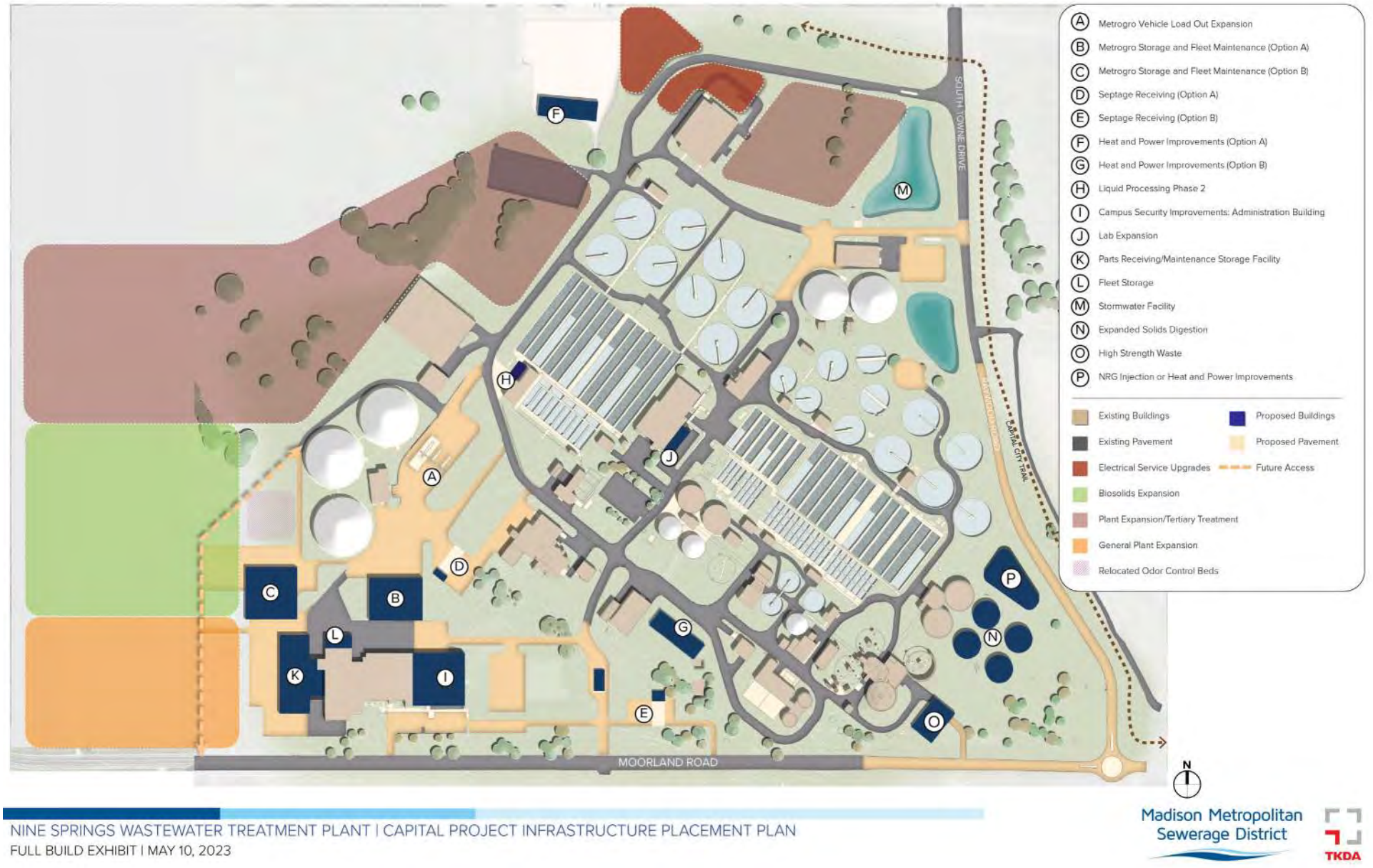



*Figure 6.16 Full CPIPP Build Out*

# Appendix A : Cost Summary

**MMSD**
**Nine Springs Wastewater Treatment Plant**
**Capital Project Infrastructure Placement Plan**
**Cost Summary_ June 2023**


Project capital costs were estimated for each of the identified projects. The opinion of probable cost (OPC) should be considered a Class 5 estimate (plus 100%/minus 50%) based on standards established by the Association for the Advancement of Cost Engineering (AACE) and American Society for Testing and Materials (ASTM). The OPC for each project was developed using information from similar projects and the consulting team's experience and judgment. The OPC will change as more information becomes available and the level of design detail is refined. The OPCs are provided to establish order of magnitude for capital planning budget purposes. Contingency as used in this OPC represents an allowance to cover unknown conditions that are not possible to be adequately defined from the information at the time it is prepared but must be accounted for by a sufficient cost to reasonably cover the foreseeable issues. Contingency is a part of the defined project scope and is not used to account for future project scope or schedule changes.

| | **CPIPP 1.0 Electrical Service Upgrades and Backup Generators** | | **CPIPP 2.1 Metrogro Loading Expansion** | | **CPIPP 2.2 Metrogro Storage and Maintenance Facility** | |
|---|---|---|---|---|---|---|
| | Replaces the outdoor service switchgear, transformers, busway system and indoor distribution switchgear, and adds backup | | Expand from 2 load-out stations to 6 at existing load-out area near Metrogro Storage Tanks. Requires Odor Control relocation. | | Combine Vehicle Loading Building functions and Maintenance Shop No. 2 functions with additional Metrogro equipment storage. | |
| **Item** | **Description** | **Cost** | **Description** | **Cost** | **Description** | **Cost** |
| Previous Plan Estimate | CIP 2024 | $ 12,101,250.00 | NA | | NA | |
| Demolition | NA | $ - | Relocate Odor Control beds, | $ 1,000,000.00 | Remove Vehicle Loading Building | $ 500,000.00 |
| Building | NA | | NA | | | |
| | | | | | Storage & Maintenance Building (Replace VLB and Maintenance Shop | $ 5,670,000.00 |
| | | | | | | |
| Site Improvements | NA | | | | | |
| Utilities | | | 2 Load-out islands (4 new load-out stations total) | $ 1,500,000.00 | NA, incl. in building costs | $ - |
| Site Amenities | | | NA | | NA | |
| Paving | | | Realign roadways, additional pave | $ 1,377,000.00 | New access drive/parking area | $ 1,377,000.00 |
| Grading/Restoration | | | Turf/landscape | $ 240,000.00 | Turf/landscape | $ 900,000.00 |
| Contingency (20%) | | | | $ 823,400.00 | | $ 1,689,400.00 |
| Subtotal | | | | $ 4,940,400.00 | | $ 10,136,400.00 |
| Design (15%) | | | | $ 617,550.00 | | $ 1,267,050.00 |
| Administrative Costs (6%) | | | | $ 247,020.00 | | $ 506,820.00 |
| TOTAL | | $ 12,101,250.00 | | $ 5,804,970.00 | | $ 11,910,270.00 |

| | **CPIPP 3.0 Septage Receiving** | | **CPIPP 4.0 Heat and Power Improvements** | | **CPIPP 5.0 Liquid Processing Phase 2** | |
|---|---|---|---|---|---|---|
| | Upgrade from 2 to 4 unloading stations at new facility. Includes volume metering, new building, direct-connect unloading, and site improvements. | | Potential power improvements include either cogeneration improvements or pipeline injection. A determination on the best path forward for the District is forthcoming. This plan provides infrastructure placement considerations for both options. | | Improvements to the liquid processing equipment for variable oxygen level delivery and treatment (low DO). Replacing existing east and west blowers, and electrical switchgears. There may be a need to expand the West Blower Building to accommodate new blower equipment. | |
| **Item** | **Description** | **Cost** | **Description** | **Cost** | **Description** | **Cost** |
| Previous Plan Estimate | NA | | CIP 2023 | $ 50,910,000.00 | CIP 2024 | $ 43,900,000.00 |
| Demolition | Remove septage receiving trough @ Headworks | $ 100,000.00 | | | | |
| Building | | | | | | |
| | Septage Receiving building | $ - | | | | |
| | | | | | | |
| Site Improvements | | | | | | |
| Utilities | Connection to Head | $ - | | | | |
| Site Amenities | NA | | | | | |
| Paving | New access drive | $ - | | | | |
| Grading/Restoration | Turf/landscape | $ - | | | | |
| subtotal before contingency | $ - | $ 100,000.00 | $ - | $ 50,910,000.00 | $ - | $ 43,900,000.00 |
| Contingency (20%) | | $ 20,000.00 | | | | |
| Subtotal | $ - | $ 120,000.00 | $ - | $ 50,910,000.00 | $ - | $ 43,900,000.00 |
| Design (15%) | $ - | $ 15,000.00 | $ - | | $ - | |
| Administrative Costs (6%) | $ - | $ 6,000.00 | $ - | | $ - | |
| TOTAL | $ - | $ 141,000.00 | $ - | $ 50,910,000.00 | $ - | $ 43,900,000.00 |

MMSD
Nine Springs Wastewater Treatment Plant
Capital Project Infrastructure Placement Plan
Cost Summary_ June 2023


| | CPIPP 6.1 Administration Building/Access Control | | CPIPP 6.2 Site Circulation and Wayfinding Improvements | | CPIPP 7.1 General Workplace Improvements | Operations Bldg |
|---|---|---|---|---|---|---|
| | Facility for public reception and control measures for primary and secondary entrances. Due to limited expansion potential of current Operations building, it is recommended to relocate a portion of staff functions to a new Administration Building to house public functions such as reception, office/work space, education and interpretation, meetings, and events. | | Pedestrian and bicycle facilties and wayfinding signage. This does not include walks or trails required as part of other CPIPP projects. | | Floor 2 renovations to address staff relocation to Administration Building, improve circulation, update meeting spaces (A/V technology), and provide wellness spaces. Floor 1 renovation to those areas not recently renovated. | |
| **Item** | **Description** | **Cost** | **Description** | **Cost** | **Description** | **Cost** |
| Previous Plan Estimate | NA | | NA | | NA | |
| Demolition | | | | | | |
| Building | | | | | | |
| | Administrative Building (LEED Cert) | $ 11,550,000.00 | | | Second floor renovation | $ 4,250,000.00 |
| | Controlled Access Building | $ 600,000.00 | | | Lab Expansion | $ 1,760,000.00 |
| Site Improvements | | | | | | |
| Utilities | Incl. in bldg. cost | | | | | |
| Site Amenities | Fencing/gates | $ 928,431.57 | Wayfinding Signage | $ 250,000.00 | | |
| Paving | Paving/Parking | $ 500,000.00 | Ped/Bike facilities | $ 207,000.00 | | |
| Grading/Restoration | Turf/Grading | $ 360,000.00 | | | | |
| subtotal before contingency | $ - | $ 13,938,431.57 | $ - | $ 457,000.00 | $ - | $ 6,010,000.00 |
| Contingency (20%) | | $ 2,787,686.31 | | $ 91,400.00 | | $ 1,202,000.00 |
| Subtotal | $ - | $ 16,726,117.89 | $ - | $ 548,400.00 | $ - | $ 7,212,000.00 |
| Design (15%) | $ - | $ 2,090,764.74 | $ - | $ 68,550.00 | $ - | $ 901,500.00 |
| Administrative Costs (6%) | $ - | $ 836,305.89 | $ - | $ 27,420.00 | $ - | $ 360,600.00 |
| TOTAL | $ - | $ 19,653,188.52 | $ - | $ 644,370.00 | $ - | $ 8,474,100.00 |

| | CPIPP 7.2 General Workplace Improvements | Storage | CPIPP 8.0 Plant Expansion and Tertiary Treatment | | CPIPP 9.0 Plant-wide Stormwater Facility | |
|---|---|---|---|---|---|---|
| | Relocate receiving dock, distribution, and staff workspace, consolidate equipment stored in Storage Building No. 1 and 2, include designated chemical storage facility, and expand fleet storage. | | Due to the potential for more stringent regulatory requirements in the future, additional wastewater treatment, including tertiary treatment, may be required. Type of future treatment is yet to be determined, no cost is provided. | | 15 ac-ft of stormwater storage to accommodate a 10 year storm event. | |
| **Item** | **Description** | **Cost** | **Description** | **Cost** | **Description** | **Cost** |
| Previous Plan Estimate | NA | | NA | | NA | |
| Demolition | | | | | | |
| Building | | | | | | |
| | Receiving and storage facility building | $ 6,380,000.00 | | | | |
| | | | | | | |
| Site Improvements | | | | | | |
| Utilities | Incl. in building cost | | | | Stormwater pond + utilities | $ 1,544,034.60 |
| Site Amenities | Incl. in building cost | | | | | |
| Paving | | $ 300,000.00 | | | | |
| Grading/Restoration | | $ 144,000.00 | | | | |
| subtotal before contingency | $ - | $ 6,824,000.00 | $ - | $ - | $ - | $ 1,544,034.60 |
| Contingency (20%) | | $ 1,364,800.00 | | $ - | | $ 308,806.92 |
| Subtotal | $ - | $ 8,188,800.00 | $ - | $ - | $ - | $ 1,852,841.52 |
| Design (15%) | $ - | $ 1,023,600.00 | $ - | $ - | $ - | $ 231,605.19 |
| Administrative Costs (6%) | $ - | $ 409,440.00 | $ - | $ - | $ - | $ 92,642.08 |
| TOTAL | $ - | $ 9,621,840.00 | $ - | $ - | $ - | $ 2,177,088.79 |

| | CPIPP 10.0 Expanded Solids Digestion | |
|---|---|---|
| | In order to accommodate expanded solids digestion facilities, Raywood Road would need to be realigned to the east to capture land for expanded processes. | |
| **Item** | **Description** | **Cost** |
| Previous Plan Estimate | NA | |
| Demolition | | |
| Building | | |
| | | |
| | | |
| Site Improvements | | |
| Utilities | Digester (1) | $ 1,700,000.00 |
| Site Amenities | | |
| Paving | Raywood Road realignment, trail reconstruction, round about | $ 1,825,000.00 |
| Grading/Restoration | | |
| subtotal before contingency | $ - | $ 3,525,000.00 |
| Contingency (20%) | | $ 705,000.00 |
| Subtotal | $ - | $ 4,230,000.00 |
| Design (15%) | $ - | $ 528,750.00 |
| Administrative Costs (6%) | $ - | $ 211,500.00 |
| TOTAL | $ - | $ 4,970,250.00 |

# Appendix B : Stormwater Technical Memo

# Stormwater Technical Memorandum

## Madison Metropolitan Sewer District CPIPP

April 16, 2023

TKDA No. 20279

## 1.1 Existing Drainage Conditions

The site includes three areas of interest; the main treatment plant footprint, the bio-solids facility, and the additional property to the southeast of the main facility. Subcatchments for each property were delineated and flow directions were noted. It should be noted that the current drainage conditions point to all the water on the main facility footprint draining to a central area in the northern half of the plant

**Table 1: Area Summary**

| | Total Area | Impervious Area | Pervious Area |
|---|---|---|---|
| Main Treatment Plant | 140.6 | 23.8 | 116.8 |
| Bio-solids Plant | 2.8 | 1.6 | 1.2 |
| Additional Area Owned by MSSD | 62.2 | 0.4 | 61.8 |
| Notes: All areas are in acres | | | |

## 1.2 Model Methodology

A HydroCAD model was prepared using inputs generated by using information from MSSD, Dane County, and NOAA Atlas 14. This information was used to calculate curve numbers, estimate reach lengths, determine storm rainfall amounts, areas of impervious and pervious area in each subcatchment, and other items needed to perform a basic stormwater model. The intended result of this model was a high level estimate of the volume of water MSSD may need to store during 4 potential rain events with the following return intervals, 1, 10, 25, and 100 years.

## 1.3 Runoff Curve Numbers and Soils Information

Curve numbers were generated using land use data provided by MSSD, soils information from Dane County DCIGIS, and curve numbers from HydroCAD based on the land use descriptions provided. Provide a description of the soils information and resources used to determined land use and curve numbers. **Table 2** contains a summary of the runoff curve numbers used for each land use type.

**Table 2: Land Use**

| Land Use Type | Runoff Curve Number (B Soils) | HydroCAD Description |
|---|---|---|
| Impervious Areas | 98 | Streets and roads paved, buildings, tanks |
| Pervious Areas | 61 | 75% grass cover, good, HSG B |

## 1.4 Rainfall

The design rainfall amounts used for the project were taken from NOAA Atlas 14. In accordance with the Code of Ordinances City of Madison, Chapter 37, Section 09, the NRCS MSE 4, 24-hour rainfall distribution was used for all storms modeled in this effort. **Table 3** contains a summary of the 24-hour rainfall totals for the various storm events, using the center of the main treatment plant as the basis.

**Table 3: Rainfall Amounts**

| Design Event | Rainfall Total (inches) |
|---|---|
| 2-Year | 2.85 |
| 10-Year | 4.06 |
| 50-Year | 6.25 |
| 100-Year | 6.57 |

# 2.0 Model Results

Description of the method and calculations for rate control. Reference Appendix G.

**Table 4: Comparison of Peak Storage**

| Discharge Location | 1-Year Event | 10-Year Event | 25-Year Event | 100-Year Event |
|---|---|---|---|---|
| | Exist. (ac-ft) | Exist. (ac-ft) | Exist. (ac-ft) | Exist. (ac-ft) |
| Main facility | 4.407 | 14.134 | 20.914 | 34.681 |
| Biosolids plant | N/A | N/A | N/A | N/A |
| Additional property | 1.999 | 4.684 | 7.413 | 3.97 |
| **Total** | **6.406** | **18.818** | **28.327** | **38.651** |

# 3.0 Storm Detention System Design

A 10-Year storm was used as the basis for the design of a stormwater detainment pond. The pond could be located on the eastern side of the main facility footprint, in a space currently occupied by two buildings, a concrete drive, and some limited green space, including maintained grass and some trees. The potential pond has an overall surface area of 2.5ac and with a depth of 8 feet, can store up to 15ac-ft of water during a storm event, before needing to be routed to a different location. This storage will allow for the 10-Year event to be completely stored on site,

# 4.0 Wetlands or Other Site Topics

The site is located near many large bodies of water, and parts of the facility are located in areas identified on FEMA FIRMETTE maps of the area. As such, there may be additional storage requirements, including a specific water quality volume, as well as the ability to contain more water due to the potential effects on downstream areas.

# Appendix A

## Existing Catchments and Proposed Pond Layout


# Appendix C : Roundabout Feasibility

# Memorandum

| | | | |
|---|---|---|---|
| **To:** | Seth McClure, MMSD | **Project Reference:** | Madison Metropolitan Sewerage |
| **Copies To:** | | | District (MMSD) |
| | | **TKDA Project No.:** | 20279.000 |
| **From:** | Lindsay Gaines, PE, PTOE | **Client No.:** | 2205638 (CIP D04) |
| **Date:** | June 8, 2023 | | |

**Preliminary Roundabout Feasibility at the Madison Metropolitan Sewerage District**

Introduction

This memo seeks to provide preliminary calculations and analysis to examine the feasibility of a roundabout in the southeast corner of the Madison Metropolitan Sewerage District (MMSD or "the District"). This roundabout would replace the existing three-legged, side street stop controlled intersection of Raywood Rd and Moorland Rd. The roundabout would not necessarily be located at the existing location of this intersection, and instead may be located further south and east. A new location would allow the entire MMSD right of way to be contiguous and uninterrupted by public roadways. This memo does not replace a roundabout justification report. This memo is intended to collect readily available information and perform simple analysis and calculations in order to allow stakeholders to make an informed decision about whether or not to proceed with an in-depth analysis of the potential roundabout.

A roundabout justification report would require traffic counts to be collected at the intersection in question and would include traffic modeling comparing existing and proposed future conditions. In addition, existing utilities and available right of way should be carefully examined to determine if there are any fatal flaws for a roundabout at this location.

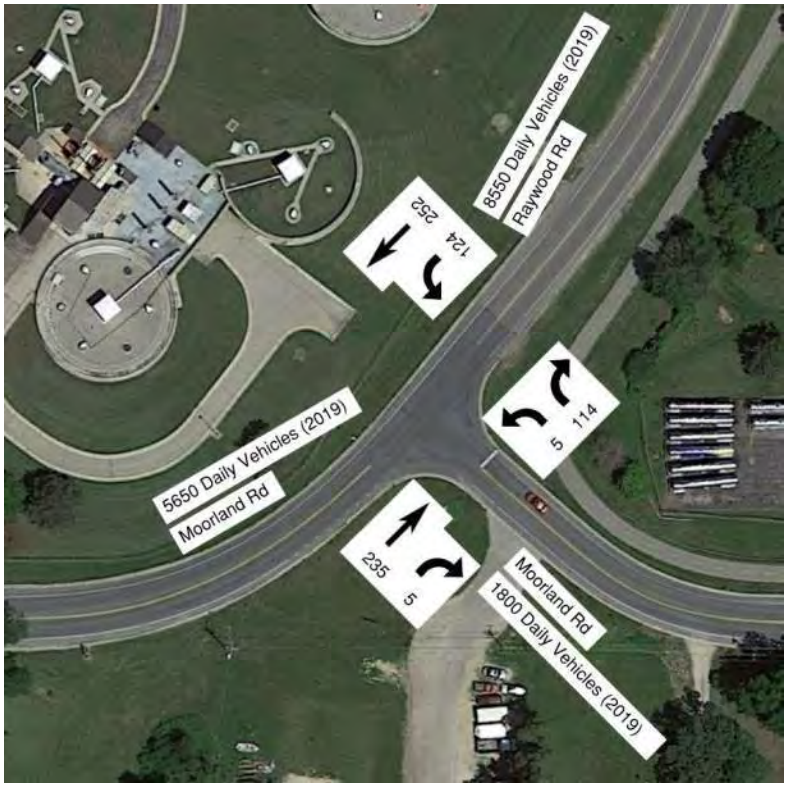
Analysis

The quality of traffic operations for a roundabout is highly dependent on the volume of traffic the roundabout experiences, as well as the orientation of those volumes. Existing traffic volume information was pulled from the City of Madison's online Traffic Count map. Turning movement counts were not available, but daily traffic volumes were available for each leg of the intersection. The north leg had 8,550 daily vehicles, the west leg had 5,650 daily vehicles, and the southeast leg had 2,800 daily vehicles, see Figure 1. All three data points were collected in 2019. From this data, an assumed "K" factor was needed to convert daily volumes into a peak hour volume.

An assumed K value was determined by examining the historic traffic study, "Beltline PEL Existing Conditions Report," which was conducted by a consulting agency on behalf of the Wisconsin Department of Transportation and published in 2015. From this report, the south leg of the intersection of S Towne Dr and Industrial Dr can be examined. S Towne Dr is the same road as Raywood Rd, though further to the north. During the AM peak hour, the south leg had 318 southbound vehicles and 322 northbound vehicles. During the PM peak hour, the south leg had 370 southbound vehicles and 386 northbound vehicles. Since the PM Peak hour had greater volumes than the AM Peak hour, the PM Peak hour will be used for this analysis. Using this peak hour data as well as the daily volumes, a K factor was calculated at 8.5% for the project area. This value seems reasonable, since a typical K value for an urban area is 7-9% and this project area is urban. For reference, a typical value for a suburban area is 9-12% and a typical value for a rural area is 12-18%. Ideally, K factors would be calculated for each leg of the roundabout individually, however hourly data was not available for the other roadways.

Using the daily volumes and the calculated K value, the following peak hour volumes were estimated, see Figure 1. It was assumed that the directional split for each leg was roughly 50/50. For example, the Raywood Rd leg is estimated to have 366 southbound vehicles and 349 northbound vehicles. The number of vehicles traveling northbound roughly equals the number of vehicles traveling southbound.

**Figure 1 – Estimated Existing Traffic Volumes**




The Highway Capacity Manual provides formulas to estimate the capacity of each leg of a roundabout. The Highway Capacity Manual is a publication of the Transportation Research Board (TRB) and is a national standard for highway capacity analysis. See Figure 2 for the formula chosen for this analysis. It was assumed that the proposed roundabout would be a single lane roundabout without bypass lanes. The existing volumes and geometry do not suggest a need for a multi-lane roundabout. This formula assumes that all vehicles traveling through the roundabout are passenger cars. These results would need to be modified to account for the expected percentage of heavy trucks. Truck data is unavailable for roadways in question; however, considering that the estimated capacity far exceeds the estimated volume, there is a notable level of confidence that the roundabout would still be under capacity when the trucks are accounted for. See Table 1 for results.

Since there is a level of uncertainty regarding the actual (vs estimated) traffic volumes at this intersection, a sensitivity analysis was completed. The estimated volumes and capacity were calculated under the assumption of a K factor of 12% instead of 8.5%. This increases the estimated volumes at the intersection and lowers the capacity, see Table 2. However, the intersection is still well within capacity for a single lane roundabout.

Note that the Highway Capacity Manual formula refers to entering traffic volumes, or one-way traffic volumes. The daily traffic volumes provided by the City of Madison online map are two-way volumes. The directional split was assumed to be 50/50, and thus the daily volumes were divided by two to determine the entering daily volumes.

**Table 1 – Estimated Volumes versus Estimated Capacity (K = 8.5%)**

| | Estimated Entering Volume [vehicles] | Estimated Entering Capacity [vehicles] |
|---|---|---|
| Moorland Rd (SW leg) | 240 | 940 |
| Moorland Rd (SE leg) | 119 | 1080 |
| Raywood Rd (NE leg) | 376 | 1222 |
| Notes: | | |

**Table 2 – Sensitivity Analysis (K value = 12%)**
**Estimated Volumes versus Estimated Capacity**

| | Estimated Entering Volume [vehicles] | Estimated Entering Capacity [vehicles] |
|---|---|---|
| Moorland Rd (SW leg) | 339 | 891 |
| Moorland Rd (SE leg) | 168 | 976 |
| Raywood Rd (NE leg) | 428 | 1162 |
| Notes: | | |

**Figure 2 – Excerpt from the Highway Capacity Manual, Chapter 22, page 22-4**

**Single-Lane Roundabouts**

The capacity of a single entry lane conflicted by one circulating lane (e.g., a single-lane roundabout, illustrated in Exhibit 22-2) is based on the conflicting flow. The equation for estimating the capacity is given as Equation 22-1.

**Equation 22-1**

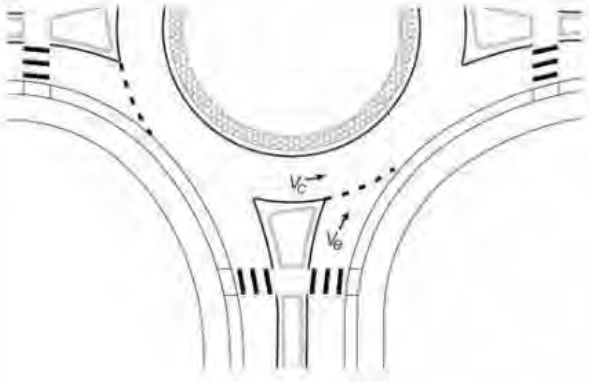
$$c_{e,pce} = 1{,}380e^{(-1.02\times10^{-3})v_{c,pce}}$$

where

$c_{e,pce}$ = lane capacity, adjusted for heavy vehicles (pc/h); and

$v_{c,pce}$ = conflicting flow rate (pc/h).

**Exhibit 22-2**
Example of One-Lane Entry Conflicted by One Circulating Lane

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# Appendix D: Meeting Materials and Notes

Madison Metropolitan Sewerage District

# Nine Springs Wastewater Treatement Plant

## Capital Project Infrastructure Placement Plan

Design Team Handbook

Updated 11/11/2022

# Table of Contents

# 01/Project Background

Every day the MMSD works to protect public health, the environment and our local waters through innovation, sustainability, and resource recovery. The Nine Springs Wastewater Treatment Plant (Plant) has served the Madison area for over 90 years, during which 11 major additions to the Plant have been constructed without a formal master plan to guide decisions regarding placement and functionality. As MMSD plans for the future operation and expansion of the Plant, a campus master plan is needed to ensure the MMSD's priorities are met and infrastructure improvements are completed orderly and efficiently on the limited remaining campus area.

The master plan will be developed following the goals the MMSD laid out in their updated strategic plan, to meet the needs of the MMSD's customer communities and the environment.

To meet future needs, the study shall encompass:


During development of the plan our team will develop an engagement strategy that will include interviews with key stakeholders to document their institutional knowledge, preferences for future plant improvements, and be asked to provide input on proposed alternatives. Through an interactive process this feedback will be distilled into the campus master plan. This plan will allow the MMSD to confidently move forward with improvements and provide a basis on how the MMSD is implementing improvements to customer communities.

## SCOPE (IN BOUNDS)

The first step in the project is development of the Project Team Charter. The last step is delivery of the Nine Springs Facility Wastewater Treatment Plant Capital Project Infrastructure Placement Plan. The project area is the Nine Springs Wastewater Treatment Plant, including vacant land around the plant previously purchased by the District for the purposes of wastewater treatment, including operations, maintenance and administration.

The project will result in a Capital Project Infrastructure Placement Plan for the Nine Springs Wastewater Treatment Plant. The plan will include up to three (3) illustrated site plan alternatives, with a narrative identifying the strengths and weaknesses of each alternative, and planning level cost estimates assuming 2023 dollars.

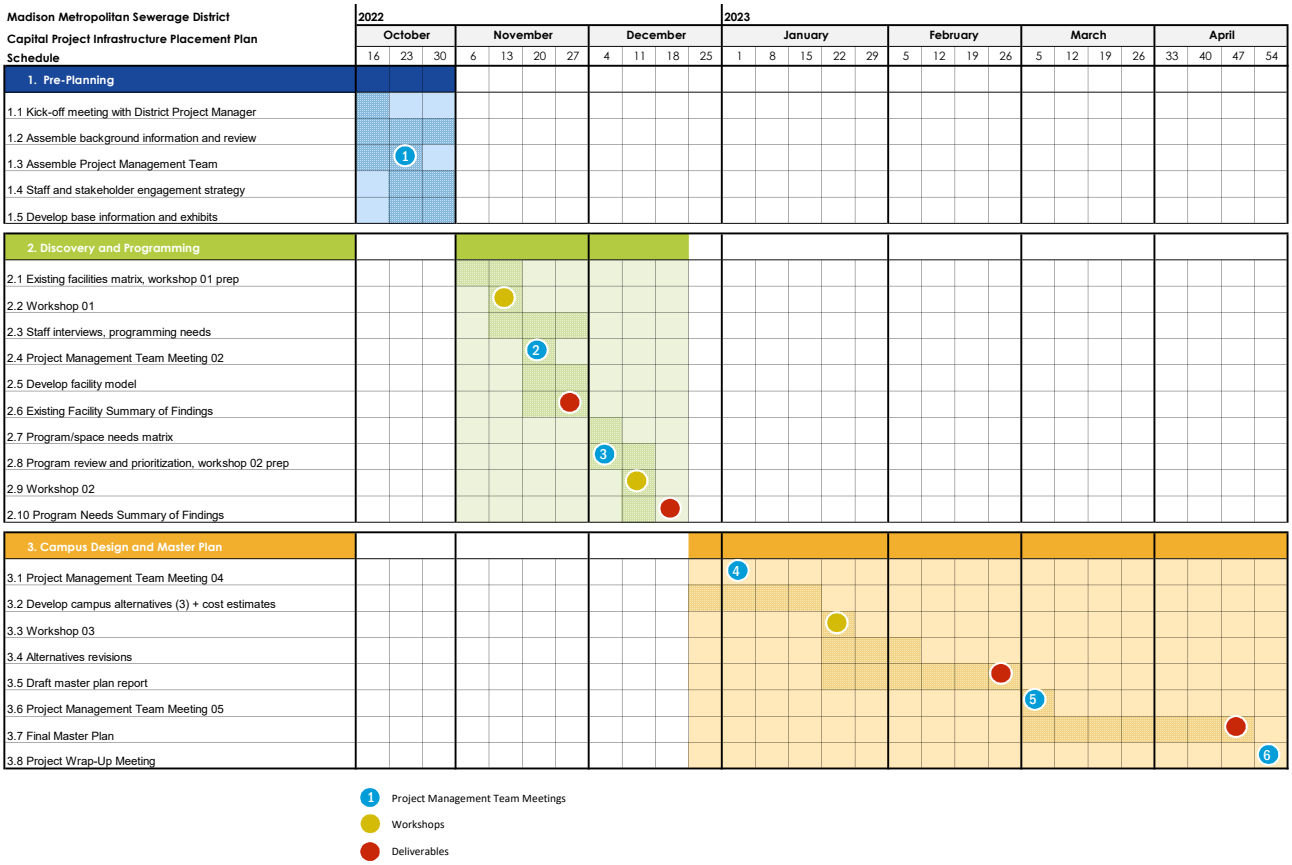
## SCOPE (OUT OF BOUNDS)

The project does not include the following:

- Design of specific projects
- Analysis or selection of alternatives from previously adopted plans
- Financial impact analysis of the alternatives on the District's Capital Program. (Note: This work may be accomplished by District staff)

Out of scope issues identified during the course of the project will be recorded for the District and placed in the "parking lot."

# Project Schedule



# Workshop Schedule

| Activity | Time | Location |
|---|---|---|
| **Tuesday, November 15, 2022** | | |
| Pre-meeting: Team Orientation with Eric/Seth | 8:00 AM - 9:00 AM | Multi Purpose Room |
| Meeting 01: CIP Review | 9:00 AM - 10:00 AM | Executive Conference Room |
| Break | 10:00 AM - 10:15 AM | |
| Meeting 02: Project Goals/Visioning (non-CIP) | 10:15 AM - 11:45 AM | Executive Conference Room |
| All Planting Meeting (TKDA Lunch Break) | 11:45 AM - 1:00 PM | |
| Plant Tour | 1:00 PM - 3:30 PM | NSWWTP |
| TKDA Team Debrief/Work | 3:30 PM - 5:00 PM | Training Room |
| **Tuesday, November 16, 2022** | | |
| Meeting 03: Comms/RT/Ecosystem | 8:30 AM - 10:00 AM | Training Room |
| Break | 10:00 AM - 10:30 AM | |
| Meeting 04: O&M/Engineering/IT | 10:30 AM - 12:00 PM | Training Room |
| Break/Lunch | 12:00 PM - 1:00 PM | |
| Meeting 05: O&M/Engineering/IT/Lab | 1:00 PM - 2:30 PM | Training Room |
| Break | 2:30 PM - 3:00 PM | |
| Workshop Debrief | 3:00 PM - 4:00 PM | Executive Conference Room |

# Existing Campus Map


Madison Metropolitan Sewerage District

TKDA

## NINE SPRINGS WASTEWATER TREATMENT PLANT - CAMPUS MAP

**MADISON METROPOLITAN SEWERAGE DISTRICT**

WORKSHOP 01: NOV. 15-16, 2022

0 100 200 FT

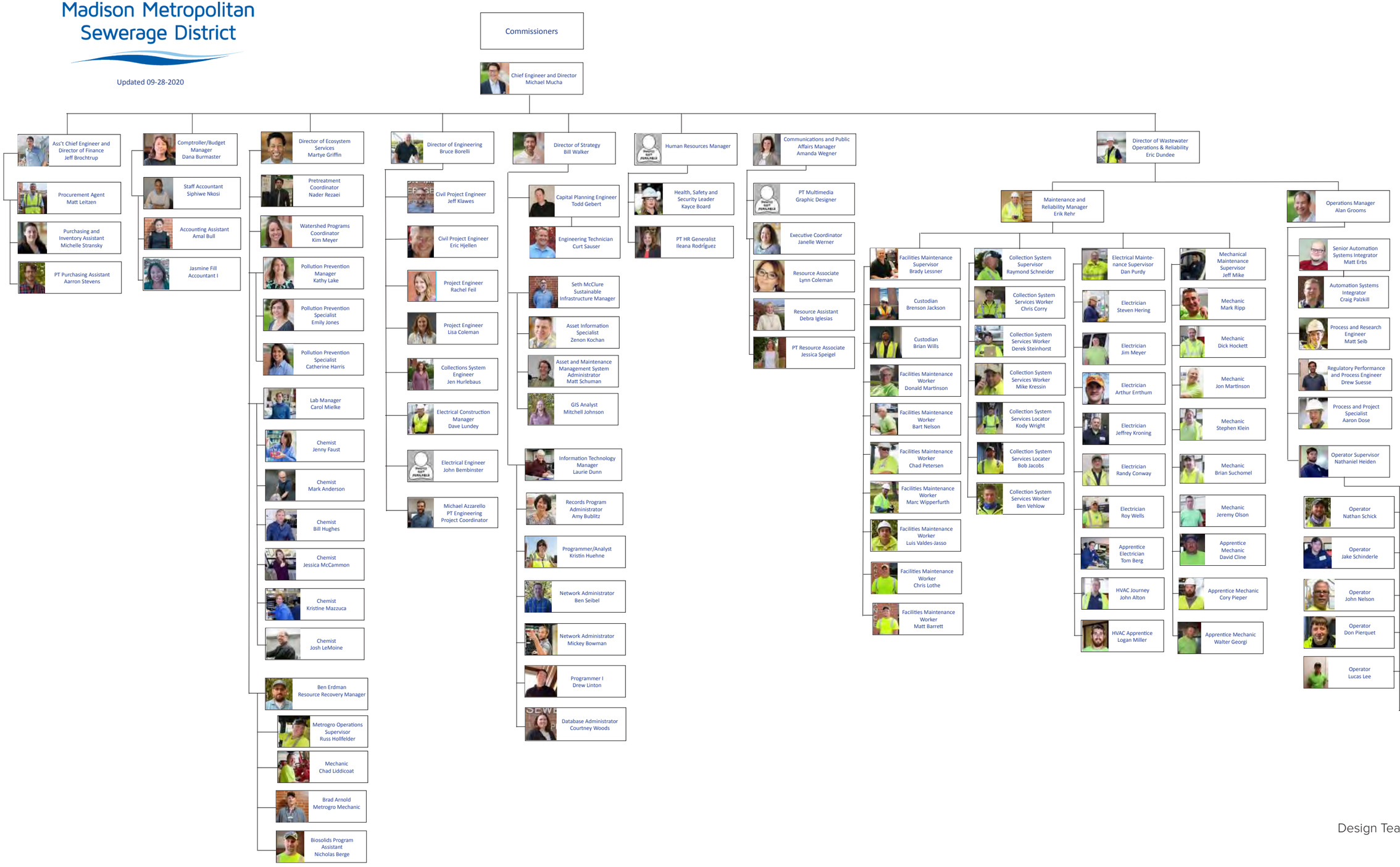
1” = 100’

N

# 02/Madison Metropolitan Sewerage District Organization Chart

Madison Metropolitan Sewerage District

Updated 09-28-2020



# 03/Stakeholder Questionnaires

Date: _____

Respondent/s Name/s: _____

Email: _____

Phone: _____

## Site/Campus

### Circulation/Access

What is the current main entrance?

How many visitors/groups come to the site on a daily basis?

How do pedestrians move throughout the site?

Is continuous access required to the substation via WWTP property?

### Vehicle Type and Quantity:

Do tour groups arrive in buses?

How many septage trucks are received on an average day? How are the trucks billed and tracked? Are there specific dumping hours?

### Parking:

Should parking be concentrated or located throughout the site?

Should visitor parking be separate?

Is visitor parking best located inside or outside the secured area?

What does a 'green fleet' look like to MMSD? (Bikes, Electric cars + Charging stations)

### O&M General

Who removes snow? Is it stored on site? What types of vehicles are used for snow removal?

Are there areas not well-utilized? Storage areas that are unsightly or unorganized?

## Utilities

Who are the utility providers?

Who is the waste management provider and how often is pickup?

## Vegetation & Drainage

Who maintains the lawn and landscape? General guidelines for appearance and maintenance?

Is there any interest in having more sustainable landscapes such as native prairie areas or raingardens?

Are there specific topographic or drainage concerns?

## Site Amenities

Amenities you wish to see on campus (outdoor break areas, walking trails, outdoor fitness areas)?

## Campus Experience/Perception

What odor control is currently in place and how is it working? Have there been public complaints? Operational concerns issues? Have alternative systems been considered?

Complaints from adjacent property owners?

Views to capture or buffer?

What does a public entrance look like to MMSD? (Updated signage, learning exhibits, green space, and informative signage around the plant?)

Do you have a space to start/end tours?

## Security

What is your current security system and is it internal or hired? If the site is fully secured what does security look like (internal team, external, 24/7, unmanned, etc.)?

## Mechanical Space Needs

What are the leaving hot water conditions from the boiler plant? The drawing indicates 180 deg F at the building, a few degrees warmer at the plant?

Does the plant have spare heating and pumping capacity and if so, how much?

How old is the plant and is it in good working order? Estimated remaining service life?

What is the current fuel source & will it remain or are there considerations for switching to something else?

How is the piping brought to the buildings? Direct bury or tunnels?

The Maintenance Building has heat pumps and hot water units. Are they working satisfactorily? Would similar systems be desired or are there other systems in mind?

What are operating characteristics of effluent system, temperature, pressure? Is there spare pumping capacity for future?

There is an expressed need for storage space. Would all storage space need to be conditioned? Perhaps heated only?

Are there any site restrictions about noise, building heights, site lines to equipment? What precautions are needed for security?

Are special materials needed? Stainless Steel or fiberglass?

Any thought to carbon free?

Are the utility drawing up to date and accurate?

## Electrical Space Needs

Has there been any solar energy site assessments completed?

Has there been any biogas studies completed?

Identify the number and location of access points? Are they adequate?

Identify the number and location of security cameras? Does coverage satisfy Department of Homeland Security intent, “we should only be fencing what we need to and can see.”

Will planned medium-voltage upgrade be done in new location & removed from its existing location?

Are there any existing issues with the electrical systems?

Identify any dated and/or worn equipment?

Identify any overloaded equipment?

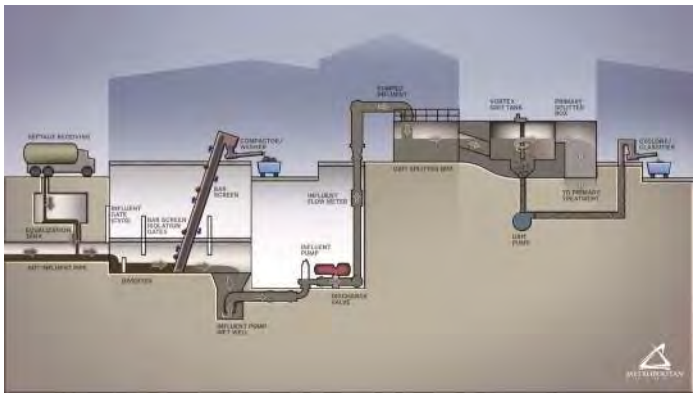
What are your other electrical concerns?

# WASTEWATER TREATMENT PLANTS

## TOOLBOX

APWA's Water Resources Management Committee is a group of dedicated volunteers who provide valuable education on Water Resources Management topics. The committee has created the Wastewater Treatment Plants Toolbox. This toolbox is intended to be an overview for individuals new to this area of public works. It can also be used as education for residents and the governing body of your agency.

Wastewater treatment plants receive used, dirty water from homes, businesses, and industries through a system of sewer pipes and lift stations. The treatment plant cleans the water to standards designed to protect public health and the environment and returns that clean water to the environment (usually a surface water body like a river, stream, or lake) or to a system for water reuse. Wastewater treatment uses physical, biological, and chemical processes to clean the water and prepare it to be released.



*An overview of the preliminary treatment process at Empire Wastewater Treatment Plant.*

### PRELIMINARY TREATMENT: REMOVING OBJECTS, SAND, AND GRIT

When wastewater enters the treatment plant, it carries with it everything that was flushed down a toilet or rinsed down a drain, like rags, food particles, or other objects. For communities with combined sewer systems—where stormwater and wastewater are collected together—the water entering the treatment plant also includes objects and sand carried over surfaces into stormwater grates by runoff.

The first step of preliminary treatment is a screen, which removes large objects (a quarter of an inch or larger, for example). This includes sticks, rocks, or rags that might clog or damage the equipment in the treatment plant. The second step of preliminary treatment is a *grit chamber,* where sand and other small, heavy particles to settle to the bottom and are removed.

*A barscreen removes large objects at the entry of Empire Wastewater Treatment Plant*

### PRIMARY TREATMENT: SEPARATING THE SOLUTION

After removing the largest particles from the wastewater, there are still organic solids suspended in the water. In primary treatment, the wastewater flows into primary clarifiers, known as sedimentation tanks, where heavy solids are given time to sink out of solution to the bottom of the tank; while fats, oils, and grease float to the top. *Skimmers* move slowly along the bottom of the tank to collect the solids and across the surface of the water to collect fats, oils, and grease (sometimes called *FOG* or *primary scum*). The solids, called *sludge* or *primary biosolids*, can be processed and then discarded in a landfill, incinerated, or applied to land as fertilizer.

*A primary clarifier allows heavy solids in the wastewater sink and fats, oils, and greases float to the top at Empire Wastewater Treatment Plant. At this plant, the biosolids are processed and applied to agricultural fields as fertilizer.*

### SECONDARY TREATMENT: PUTTING THE BACTERIA TO WORK

In secondary treatment, plant operators put the bacteria (*activated sludge*) already in the wastewater to work. The bacteria use a natural process to break down the nutrients that remain in the water. Treatment plants accelerate that process by adding sludge with a lot of bacteria present and pushing air into the tanks (*aeration*) or agitating the water to add air, which helps create an

*continued on next page >>*

environment for the bacteria to grow. As the bacteria consume the nutrients, large particles are created and settle to the bottom of the tanks. Like the sludge separated in primary treatment, a portion of these solids are removed from the tank, processed, and can be discarded in a landfill, incinerated, or applied to land as fertilizer. The remaining portion are recycled back into the water treatment process.

## DISINFECTION: RETURNING SAFE WATER TO THE ENVIRONMENT

Before releasing the water to the environment, it is disinfected to remove any remaining disease-causing bacteria. This helps ensure the water is safe for all downstream users of the water, including people and wildlife. Water is often disinfected with chlorine, but some treatment plants use ozone or ultraviolet (UV) light for disinfection. When chlorine is used, the water is tested, and may be dechlorinated, before it is released to the environment.

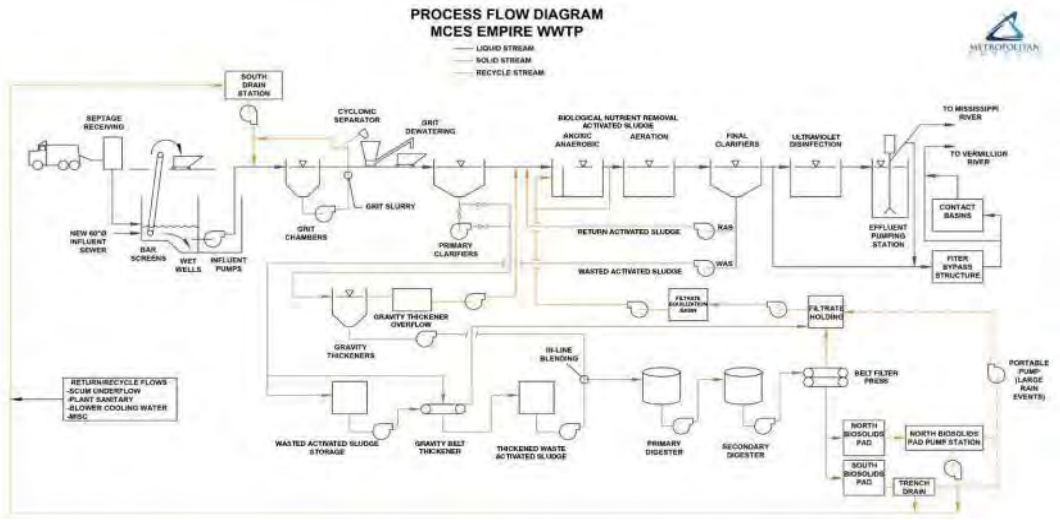
## SOLIDS HANDLING: A RENEWABLE RESOURCE

Solids that settle out of the treatment processes can be reused right at the wastewater treatment plant or in the community. Solids can be incinerated on site; some plants use the steam created to support plant operations. In some plants, solids may be sent to a *digester*, where they are broken down and the organic components are reduced. This process creates methane gas which can be captured and burned for energy to power plant equipment or provide heat. The solids that remain can be incinerated to generate additional energy or they can be applied to agricultural fields as a nutrient-rich fertilizer.

**All images are courtesy of the Metropolitan Council Environmental Services (MCES). MCES provides wastewater services to 110 communities in the Twin Cities region.*

*Aeration tanks at Metropolitan Council's (Minnesota) Empire Wastewater Treatment Plant create a thriving environment for bacteria to break down nutrients in the water.*

*UV channels at Metropolitan Council's (Minnesota) Empire Wastewater Treatment Plant operate April through October to disinfect treated wastewater before it is returned to a local river.*




*A process flow diagram of the treatment process at Empire Wastewater Treatment Plant.*

## FOR MORE INFORMATION

**Metropolitan Council Video Library**
https://metrocouncil.org/Wastewater-Water/Projects/Metro-Plant-Solids-Management/Videos.aspx

**US Environmental Protection Agency: Primer for Municipal Wastewater Treatment Systems**
https://www.epa.gov/sites/production/files/2015-09/documents/primer.pdf

**Cole Parmer: The Wastewater Treatment Process**
https://www.coleparmer.com/tech-article/eight-stages-of-wastewater-treatment-process

**Concerning Reality Educational Video: How Do Wastewater Treatment Plants Work?**
https://www.youtube.com/watch?v=FvPakzqM3h8

# Glossary of Wastewater Terms

## Activated Sludge

Sludge that has undergone flocculation forming a bacterial culture typically carried out in tanks. Can be extended with aeration.

## Advanced Primary Treatment

The use of special additives to raw wastewater to cause flocculation or clumping to help settling before the primary treatment such as screening.

## Advanced Wastewater Treatment

Any advanced process used above and beyond the defacto typical minimum primary and secondary wastewater treatment.

## Aerobic Wastewater Treatment

Oxygen dependent wastewater treatment requiring the presence of oxygen for aerobic bacterial breakdown of waste.

## Alkalinity

A measure of a substances ability to neutralize acid. Water containing carbonates, bicarbonates, hydroxides, and occasionally borates, silicates, and phosphates can be alkaline. Alkaline substances have a pH value over 7

## Anaerobic Wastewater Treatment

Wastewater treatment in the absence of oxygen, anaerobic bacteria breakdown waste.

## Bacteria

Single cell microscopic living organisms lacking chlorophyll, which digest many organic and inorganic substances. An essential part of the ecosystem including within human beings.

## Bioengineering

The use of living plants as part of the system, be it wastewater treatment, erosion control, water polishing, habitat repair and on.

## Biosolids

Rich organic material leftover from aerobic wastewater treatment, essentially dewatered sludge that can be re-used.

## BOD - Biochemical Oxygen Demand

Since oxygen is required in the breakdown or decomposition process of wastewater, its "demand" or BOD, is a measure of the concentration of organics in the wastewater.

## Clarifier

A piece of wastewater treatment equipment used to "clarify" the wastewater, usually some sort of holding tank that allows settling. Used when solids have a specific gravity greater than 1.

## COD - Chemical Oxygen Demand

The amount of chemical oxidant required to breakdown the wastes, also an indicator of the concentration of organics.

## Cold Climate Limitations

The limitations of various wastewater treatment options caused by severe cold and its incidents such as ice, snow, very low temperatures and so on.

## Combined Sewer

Combining the municipal sewer systems with storm drainage. Risks overpowering the system in large rain events. The benefit is that pollutants from storm drainage get treated,

## Combined Sewer Overflow (CSO)

When a combined sewer system is overpowered by storm drainage and overflows.

## Constructed Wetland

An artificially created wetland usually with a waterproof lining for wastewater purification. Detention, flow rates, types of plants and other parameters are controlled to improve BOD, SS and N removal. Typical riparian plants like cattails and reeds are used to provide bacteria with an oxygenating root zone.

## Detention Time - Retention Time, Residence Time

How long on average wastewater undergoes the wastewater treatment process. Time vary greatly across various types of wastewater treatment, from minutes to weeks.

## Dewatered Sludge

The sludge after it's been dewatered, also know as sludge cake.

## Dewatered Sludge Cake

The sludge after dewatering that is cake like, compressed. The lower the water content the better for wastewater treatment purposes.

## Dewatering

Removing water from sludge or other solids.

## Digestion

The breaking down of sludge and other waste biologically by microorganisms. Results in byproducts such as methane gas, carbon dioxide, sludge solids and water. Aerobic digestion requires oxygen, anaerobic digestion the absence of oxygen.

## Denitrification

Biologically removing nitrate converting it to nitrogen gas.

## Disinfection

The use of chemicals to kill any disease causing organisms in the polished wastewater. UV light can also be used.

## Dissolved Oxygen (DO)

The amount of oxygen dissolved in the water. Measured in milligrams per liter.

## Ecological Engineering

Systems designs that are considered to be "sustainable", that is with the aim of having little to no impact on earth's ecology. See Industrial Ecology.

## Effluent

The final output flow of a wastewater treatment plant.

## Extended Aeration

An aeration system that adds aerobic sludge digestion to the activated sludge process.

## Facultative Ponds

Wastewater ponds with some form of aeration for oxygen replenishment. Can also use algae and other plants for oxygen replenishment.

## Floc

Particulate and or bacterial clumps forming wooly looking clusters in wastewater. In biological processes such as extended aeration or activated sludge and others the floc contains aerobic or anaerobic microorganisms. For industrial applications flocculants are used.

## Flocculation

The process whereby a chemical or other substance is added to wastewater to trap or attract the particulate suspended solids into clusters or clumps of floc or flocculent, wooly looking masses.

## Flocculating Agent

The flocculant or chemical used to cause flocculation.

## Flocculant

Same as flocculating agent, the catalyst substance that causes the chemical reaction with TSS to form flocculent many times encapsulating the solids.

## Flocculent

The "floc" or wooly mass of clusters that is formed in flocculation. Many times used interchangeably with "flocculant" however truly refers to the floc mass and not the catalyst flocculating agent.

## Free Water Surface Wetland (FWS)

A constructed wetland or other shallow wastewater treatment pond where the shallow water is exposed directly to the air.

## Grease

Fats, soaps, oils, waxes and etc. in wastewater.

## Grit Chamber

Usually in municipal wastewater treatment, a chamber or tank in which primary influent is slowed down so heavy typically inorganic solids can drop out, such as metals and plastics.

## Headworks

The beginning of the treatment plant where the influent begins treatment.

## Industrial Ecology

Industrial Ecology (IE) focuses on combining perpetually desirable outcomes in environment, economy and technology sustainably. The primary tenet is that all systems mimic nature and are thus closed loop, continuous, circular. In wastewater treatment industrial ecology would mean that all so called "waste" is re-input into the same or other process. For example, biosolids as fertilizer can be considered a use of sludge consistent with industrial ecology. Recycling wastewater into the treatment plant, manufacturing or other process is another example.

## Industrial Wastewater Treatment

Wastewater treatment for industries such as manufacturing, food processing, corrugators, printing and so on. Paper and pulp mills' treatment of wastewater is an example of industrial wastewater treatment. Municipal wastewater treatment would be an example not considered to be industrial.

## Influent

The untreated wastewater or raw sewage coming into a wastewater treatment plant.

## Influent Screens

Screens used to remove large inorganic solids from the waste stream.

## Innovative and Alternative (I&A)

An EPA term for wastewater treatment systems that reuse all or part of the wastewater.

## Liquid Solids Separation

The process of separating the liquids and solids in a given wastewater. Liquid/solids separation comes in one of 3 processes:

1. If the solids sink (specific gravity greater than 1) use a clarifier
2. If the solids float (specific gravity less than 1) use a floatation unit (DAF)
3. If neither sink or float (specific gravity is 1) try using a screen (rotary or parabolic)

## MGD

Million Gallons per Day - 694.4 gallons per minute.

## Modified Permit, Waiver

EPA variances or waivers granted.

## N: Nitrogen

The measure of nitrogen usually as ammonia and nitrate present in various wastewaters.

## Natural Systems

Wastewater treatment systems usually biological with a minimum of mechanical components or processes, for example, constructed wetlands.

## Onsite

Wastewater treatment at the point of production typically associated with residential systems such as septic tanks. Onsite treatment plants are also common in hotels, schools, small communities and manufacturing plants. Onsite treatment can reduce the costs of concentrating wastewaters into one huge treatment plant.

## Overland Flow Land Treatment

Grassy slopes used to treat wastewater. Leftover water is captured at the bottom.

## pH

A measure of acidity or alkalinity of water, or any given substance. The scale is 1 to 14 with 7 being neutral. Over 7 is alkaline or caustic, under 7 is acid or base.

## P: Phosphorus

The measure of Phosphorus present in wastewater.

## Primary Wastewater Treatment

The first process usually associated with municipal wastewater treatment to remove the large inorganic solids and settle out sand and grit.

## Raw Sewage

Untreated sanitary wastewater.

## Reclaimed Water

Reusable wastewater from wastewater treatment such as tertiary treatment of wastewater in biological and other systems.

## Run Off

Storm flows that aren't absorbed and flow off the land and streets.

## Sanitary Wastewater (domestic)

Wastewater from human domestic water use.

## Scum

Usually fatty material in wastewater that floats.

## Secondary Wastewater Treatment

Second biological process of digestion with bacteria.

## Sewage (or wastewater)

The used water and added waste of a community which is carried away by drains and sewers.

## Sewerage

A system of sewers; the removal of waste materials by means of a sewer system.

## Sludge

The solid waste material which settles out in the wastewater treatment process, sometimes biosolids. Can be dewatered and reused or disposed.

## Sludge Dewatering

Removing the remaining water from sludge for reuse and to lighten the sludge for reuse or disposal.

## Storm Water Run-Off (SRO)

The pulse of surface water following a rainstorm. The water carries sediment, gas, oil, animal feces, glass and other waste from the watershed to receiving waters creating a difficult urban/suburban wastewater problem.

## Storm Drain

A pipeline or channel system that carries surface water and/or runoff to public waters, but does not feed into sewer system.

## Subsurface Flow Wetland (SF)

A type of constructed wetland in which primarily treated waste flows through deep gravel or other porous substrate planted with wetland vegetation. The water is not exposed to the air, avoiding problems with odor and direct contact.

## TDS - Total Dissolved Solids

Total Dissolved Solids (TDS) is the combined total of all dissolved solids in wastewater, both organic and inorganic and very fine, such as colloidal minerals. Generally particles must be smaller than two micrometers to be considered a dissolved solid. For example, salt dissolved in water is a dissolved solid. Therefore TDS will "survive" screening or other coarse filtration.

## Tertiary Wastewater Treatment (Advanced)

Biological or chemical polishing of wastewater to remove organics, solids and nutrients. Tertiary wastewater effluent limits are generally 10 mg/1 BOD5 and 10 mg/1 TSS.

## Tertiary Treatment

The use of filtration to remove microscopic particles from wastewater that has already been treated to a Secondary Level. Anthracite coal is the filter medium used by the MWWD.

## Treatability

How treatable a water sample is with a given substance.

## TSS - Total Suspended Solids

As the name implies, the total solid particles that are suspended (as opposed to dissolved) in the wastewater. TSS must be filtered out, flocculated, digested and so on for removal in the treatment of wastewater. Though not necessarily pollutants TSS is considered to be a measure of pollutants in water by the EPA in the US.

## Turbidity

A measure of how clear water is in Nephelometric Turbidity Unit (NTU), invisible to the average naked eye until readings in excess of 100 are reached, typically determined by shining light through a sample placed in a turbidimeter.

## Ultraviolet Disinfection (UV)

The use of ultraviolet light to kills bacteria and other microorganisms in water and wastewater. Typically a final treatment step.

## Wastewater

Wastewater is "used" water, the water leftover after its use in numerous application such as industrial, agricultural, municipal, domestic and on.

# NINE SPRINGS PLANT FACILITY MASTER PLAN

## Visioning Activity

Madison Metropolitan Sewerage District

TKDA

# Right activity/program in the right place?

- No build alternative?
- Workforce Development
  - Does this allow you to do your job more efficiently?
  - Are circulation conflicts addressed?
  - Enough storage?
  - Pros/cons if your work space moves? If it doesn't move?
- Public Trust
  - Is there a clear separation of public vs. plant functions?
  - Do the access points address security strategies?

# CIP

CIP ID# **A01.4** West Blowers and Switchgear Replacement

**Start Date**
2022

**Completion Date**
2026

**Project Type**
Plant Improvements – Aeration System

**Location**
Nine Springs Wastewater Treatment Plant

**Description**
This project will replace the west blowers and associated medium-voltage switchgear. These facilities have been in operation for more than 35 years, and they are currently operating beyond their expected lifespan. This project was included in the 2016 Liquid Processing Facilities Plan. It is anticipated that the costs of the project will be funded through the Clean Water Fund.

**Background**
The 2016 Liquid Processing Facilities Plan recommended replacement of the west blowers using a phased approach. The plan called for two blowers to be replaced between 2020 and 2025, and the remaining blower and blower switchgear to be replaced shortly after 2024. Since the plan was developed, the condition of the blowers has deteriorated significantly, and one of the units is inoperable and requires costly repairs. Given the condition and criticality of this equipment, District operations staff is recommending that all three blowers and associated switchgear be replaced as soon as possible to ensure that this critical process continues to operate satisfactorily.

CIP ID# **A04.1** Heat and Power Improvements

**Start Date**
2025

**Completion Date**
2031

**Project Type**
Energy-Related Projects – Use Reduction/Generation

**Location**
Nine Springs Wastewater Treatment Plant

**Description**
The purpose of this project is to identify and replace aging assets associated with the District's energy-producing infrastructure and to optimize the use of energy going forward. These improvements will position the District to use its biogas to generate electricity on site at greater efficiency or to produce a biogas of pipeline quality that can be sold to others. This project was evaluated as part of the 2020 Energy Management Master Plan. Additional facility planning and design phases are expected to precede construction. It is anticipated that all project costs will be financed through a loan from the Clean Water Fund.

**Background**
An energy study was conducted in 2014 by Strand and Brown and Caldwell to provide a roadmap for how the District might achieve energy independence. Areas of focus included ways to reduce energy usage, improve utilization of digester gas and produce more energy. The 2020 master planning study expanded on all these areas and examined the most energy-efficient way to handle and dispose of biosolids. It is anticipated that the master plan will lead to three major projects going forward: (1) Heat and Power Improvements; (2) Biosolids Processing; and (3) Miscellaneous Energy Projects.

CIP ID# **A11** Septage Receiving Modifications

**Start Date**
2024

**Completion Date**
2027

**Project Type**
Plant Improvements – Septage Receiving

**Location**
Nine Springs Wastewater Treatment Plant

**Description**
This project will correct problems encountered with operation of the existing septage receiving facility. Work will include reconfiguration of the existing facility to allow improved traffic flow, better screening equipment upstream of the Headworks Facility and implementation of more security and tracking measures to reduce the potential for unauthorized discharges. This project was included in the 2016 Liquid Processing Facilities Plan. It is anticipated that project costs will be funded through the Clean Water Fund.

**Background**
The septage receiving facility was constructed as part of the Tenth Addition to the treatment plant and has experienced a number of operational difficulties since it was placed into operation. Trucks discharging at the facility have to back up to empty their contents, resulting in congestion during periods of heavy traffic and icy and unsafe conditions in winter. Further, sand and grit accumulate in the discharge trough, which requires manual cleaning by District staff on a frequent basis. Improvements will allow for one-way traffic for haulers and an improved screening system to keep unwanted material out of the screening channel. A space needs study for the treatment plant is planned for 2022-2023, which will help inform the preferred location of the future facility.

# Agenda

- Introductions (5 minutes)
- Set the Stage (20 minutes)
  - Review Existing Plans
  - Recap CIP discussion
  - Review Strategic Plan
  - Review Existing Campus Map
- Visioning Activity (55 minutes)
- Tour Logistics (5 minutes)

# Introductions

# Setting the Stage

# Previous Planning Efforts

- List all of their plans…

# Recap CIP Discussion

- Addressing multiple scenarios
- Infrastructure projects not included in the CIP

# Review Strategic Plan

## Our Purpose

Protect public health, welfare and the environment by providing efficient and strategic wastewater management on behalf of our owner communities.

# Our Owner Expectations

1. Owners expect the District to protect public health, welfare and the environment.
2. Owners expect the District to provide cost-effective and efficient wastewater treatment.
3. Owners expect the District to be resilient and sustainable in its operations and business practices, so it is meeting the needs of the present without compromising the ability of future generations to meet their own needs.
4. Owners expect the District to comply with regulations and proactively anticipate future regulatory needs.
5. Owners expect the District to be collaborative, fair, responsive and equitable, with all communities having access to safe, clean, affordable wastewater services and share the economic, social and environmental benefits of wastewater systems.

# Performance Areas

## Adaptation

The District maintains flexibility, reliability, and resilience by addressing major factors that could increase District costs, render District assets obsolete, change the District's role, increase the District's value, or require changes in the District's work, where such factors require extraordinary effort, expense, reorganization, addition of function, or political or collaborative effort.

## Financial Sustainability

The District maintains financial sustainability to ensure having adequate monies for District obligations over the long term.

Financial sustainability requires balancing the benefits of spending against financial burdens on communities and individuals.

It further requires that spending be cost-effective and justified, needs can be met without disruption, spending and revenue are smoothed over time, and burdens on communities and individuals are acceptable to them and are equitable.

It finally requires transparency so that those who fund the District can have confidence in the decisions made on their behalf.

## Infrastructure Reliability

The District manages its physical and technological infrastructure so that it fulfills its intended functions to an acceptable level of performance at an acceptable level of risk and continues doing so through changes in the service area, climate, and other external conditions.

The District does this by setting standards of performance and risk for District assets, making judicious investments, performing conscientious maintenance, and planning for changing conditions.

## Public Trust

The District maintains public trust to support its long-term success through public confidence, support of other governments and institutions, and the social capital needed to operate effectively.

To uphold public trust, the District must be responsive, reliable and fair; it must listen, communicate and engage with openness and transparency; it must not impose inequitable burdens on communities, and it must have integrity in its operation, business practices and relationships with its owner communities and the broader community it serves.

## Regulatory Compliance

The District addresses regulatory factors to ensure that we meet existing permit requirements with only minor and infrequent violations, maintain a low risk of significant violations on an ongoing basis, and respond to violations as appropriate to the significance of the violation.

To achieve this, the District monitors and corrects performance against regulatory requirements, maintains effective working relationships with regulators, monitors trends in regulation, makes plans to adjust to regulatory trends, and works to influence regulatory trends to support cost-effective achievement of goals.

## Strategy Execution

The District executes its strategy to ensure we are meeting our purpose, we have the people and resources to do the right work at the right time to provide the greatest value, and critical results are obtained when needed.

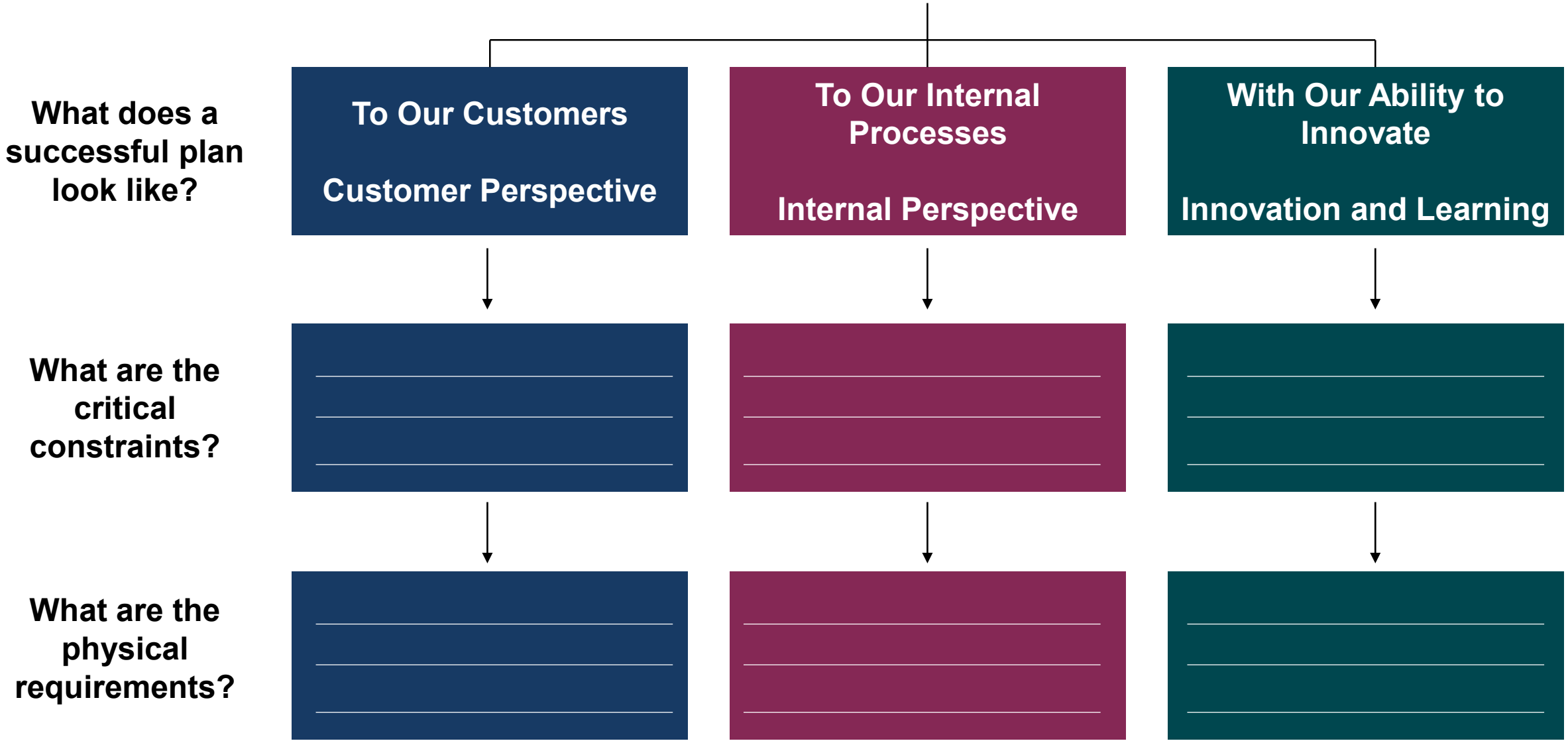
To accomplish this, we must effectively organize and prioritize work, staff and external resources; give staff clear direction to guide their efforts; engage in effective project management and oversight; and monitor performance indicators to respond to changing needs. This requires active and diligent executive-level monitoring, guidance, and support.


Pumping Station No. 3
Effluent Building
Storage Building No. 2
Storage Building No. 1
Maintenance Shop No. 2
Service Building
Maintenance Shop No. 1
Biosolids End Use Facility
Aeration Control Building No. 4
Electrical Substation U2
Blower Building No. 1
Sludge Dewatering Building
Blower Building No. 2
Operations Building
Aeration Control Building No. 1
Aeration Control Building No. 2
Electrical Building U15
Aeration Control Building No. 3
Metrogro Pumping Station
Storage Building No. 3
Sludge Control Building No. 1
Gas Control Building
Headworks Building
Electrical Building U1
Boiler Building
Primary Sludge Pumping Building No. 2
Sludge Control Building No. 3
Struvite Harvesting Building
DAF
DAF Building
Thickener
Ferric Chloride Vault Building
GBT
GBT Polymer Building
Sludge Control Building No. 2
Gas Conditioning Skid
WAS Thickening Building
Vehicle Loading Building
Maintenance Facility
901 ft
848 ft
Moorland Rd

# Visioning Activity

## Our Purpose

Protect public health, welfare and the environment by providing efficient and strategic wastewater management on behalf of our owner communities.



# Tour Logistics

## Top 3 biggest issues?

# MEETING NOTES

**To:** Attendees

**Copies To:**

**From:** Kathleen Anglo

**Date:** 11.21.2022

**Reference:** MMSD | Nine Springs Wastewater Treatment Plant
Capital Project Infrastructure Placement Plan – Workshop 01

**TKDA Project No.** 20279.000

**Client No.**

On Nov. 15, 2022 at 9:00 am the following team members met at *Nine Springs Wastewater Treatment Plant* to review CIP Projects for consideration for the Capital Project Infrastructure Placement Plan.

## MEETING ATTENDEES:

| Name | Organization/ Discipline | Email |
|---|---|---|
| MMSD Staff: | | |
| Eric Dundee | Project Champion \| Dir. Operations and Reliability | ericd@madsewer.org |
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| Lisa Coleman | Dir. Engineering | lisac@madsewer.org |
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| Sam McKinney | Stakeholder Engagement | Samantha.mckinney@tkda.com |
| Dana Schumacher | Landscape Architect | Dana.schumacher@tkda.com |
| Brian Dunn | Electrical Engineer | Brian.dunn@tkda.com |

The following items were discussed.

## Meeting Overview:

- Review of projects included in the CIP (Capital Improvements Plan)
- CAD maps are more up-to-date than GIS (MMSD to send TKDA updated CAD maps)

1. Introductions
2. Existing campus overview

a. Capital Project Infrastructure Placement Plan: vision 10-20 years out due to changes in technology, potential regulatory requirements, or other parameters. Potential for too many changes past 20 years.
b. 50 -year Master Plan: typically only gets updated towards end of 50 year span – last updated in 2009.

3. CIP Projects
    a. A01 Liquid Processing 2
        i. No current new buildings are proposed at this time.
        ii. A01.4 West Lower Blower Building 2: potential expansion
            a) Building had construction issues to review during construction prior to proceeding.
        iii. Look at a better process for screening and protection of screens from damage.

    b. A03 Electrical Service Equipment Replacement - MGAE (Madison Gas and Electric)
        i. MMSD to purchase a backup generator to be placed within the footprint by the substation for operation by MGAE.
        ii. Access to substation
            a) Separate entrance to substation exists, but currently it is accessed through plant.
            b) Prefer if access is separate from plant, but not essential.
    b. A04.1 Heat and Power Improvements
        i. Potential for solar.
        ii. Sludge control #2 engines are 35 years old.
        iii. If biomass is going to continue to be pursued, existing space is too small and new area and engines will be needed. Possible locations: next to boiler building or next to boneyard.
            a) Option changes if chosen to connect to MGAE and connection with pipeline.
    c. A07 Metrogro Applicators and Equipment
        i. Change to a Class A or B cake solid
            a) Will require space for additional centrifuge or composting area
            b) Is compost for general public use or will it be handled through select vendors (implications on access to material). How to keep secure?
            c) If it will be compost material, 1/3 of the mix would need about 3 acres to process.
        ii. Additional space for a 4th tank for Class B liquid has been identified.
        iii. Vehicle Loading Building could use covered storage (applicators are stored in 2 areas on campus) and additional shop space.
    d. A10 Liquid Processing phase 3.
        i. A10.1 Headworks screening: no changes to building needed, upgrades to grates/screens
    e. A11 Septage Receiving Modifications

i. Current system of septage receiving doesn't work well – drive in and back up into trough
ii. Haulers are using Gate 4 and Gate 2 (was Gate 1 previously, but that has been closed due to damage)
iii. About 100-120 vehicles per day (2 haulers).
iv. Would like better options for metering and sampling collection.
v. Meeting with septage haulers will be scheduled.

4. Discuss future CIP projects not in the 6-year window
    a. Review Alternatives for large projects (biosolids, LPI, Heat & Power)
    b. Safety and Security
        i. Gates remain open/unlocked during operation hours
        ii. Deliveries arrive haphazardly and there is a lot of coordination to get drivers/visitors to the right place
        iii. Chemical storage needs to be centralized to a few locations and stored properly.
    c. Storage Buildings
        i. In need of repair (approx. $200k estimate to complete repairs to existing structures)
        i. Inefficient use of time moving from one end of the plant to the other to gather necessary tools and supplies
        ii. They have ghost inventory that is not recognized but is a real inventory
            a) This consists of "Extra" and "Salvaged" items.

**The above represents the writer's understanding of the meeting. Any errors, omissions, and/or discrepancies should be reported to him/her promptly.**

# MEETING NOTES

**To:** Attendees

**Copies To:**

**From:** Kathleen Anglo

**Date:** 11.21.2022

**Reference:** MMSD | Nine Springs Wastewater Treatment Plant
Capital Project Infrastructure Placement Plan – Workshop 01

**TKDA Project No.** 20279.000

**Client No.**

On Nov. 15, 2022, at 10:15 am the following team members met at *Nine Springs Wastewater Treatment Plant* to review non-CIP Projects and Plant Vision for consideration for the Capital Project Infrastructure Placement Plan.

## MEETING ATTENDEES:

| Name | Organization/ Discipline | Email |
|---|---|---|
| MMSD Staff: | | |
| Eric Dundee | Project Champion \| Dir. Operations and Reliability | ericd@madsewer.org |
| Seth McClure | PM \| Strategic Performance and Policy Advisor | sethm@madsewer.org |
| Michael Mucha | Chief Engineer and Director | michaelm@madsewer.org |
| Mike Lipski | Human Resources Manager | mikel@madsewer.org |
| Marcus Canty | Health, Safety, and Security Leader | marcusC@madsewer.org |
| TKDA Staff: | | |
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| Ben Olson | Project Architect | Benjamin.olson@tkda.com |
| Josh Elder | Architectural Technician | Josh.elder@tkda.com |
| Dan Nesler | Wastewater Engineer | Daniel.nesler@tkda.com |
| Amy Patterson | Civil Engineer | Amy.patterson@tkda.com |
| Jeannine Clancy | Project Advisor \| Strategic Communications | Jeannine.clancy@tkda.com |
| Sam McKinney | Stakeholder Engagement | Samantha.mckinney@tkda.com |
| Dana Schumacher | Landscape Architect | Dana.schumacher@tkda.com |
| Brian Dunn | Electrical Engineer | Brian.dunn@tkda.com |

The following items were discussed.

1. Introductions
2. Other Plans to review:
    a. Homeland Security Report: MMSD to provide for review.
    b. Shop One Strategic Plan: MMSD to provide for review.

3. NSWWTP role as critical infrastructure
    a. Flexibility is needed if the future does not materialize as planned in the CIP to change or adjust to meet those alternatives.
    b. TKDA will incorporate various alternatives outlined in previous planning documents and provide space required for whichever alternative may be chosen.
    c. Resilience is looked at as how quickly MMSD can bounce back from an unplanned event.

4. Workforce needs for future growth, planning and adaptability.

5. Visioning Activity


6. Critical Perspectives and Constraints to meeting MMSD purpose.
    a. Customer Perspective/Constraints = Green post-its
    b. Internal Perspective = Purple post-its
    c. Innovation/Learning = Yellow post-its

Green Post-its (Customer Perspective):

- Wayfinding
- Septage haulers - where do they go? Ease of access
- Gates with entrances open is confusing - Are they allowed to come in or not?
- Deliveries: no central location
- Deliveries: where do they go?
- Deliveries: dock in high traffic area in Maintenance Facility creates conflicts
- Traffic: speed, flow, and safety
- Plant operations hours may not coincide with septage hauler schedules and deliveries
- Visitor entrance is in the middle of campus
- Where is access for bikes, peds, transit users (Gate 3 is closed @ bus stop)
- Visitor Center: start/stop for tours
- Roads: dangerous, conflicts with trucking, visibility issues
- Central receiving of public
- Central location and flow for tours
- General busing/mail/meeting attendees
- Ops building in the center
- Commission meeting location
- All buildings inside fence line (current condition)
- Fire/police response
- Security

Purple (Internal Perspective):

- Fencing
- Most Buildings are unlocked - easy to access critical infrastructure
- No room large enough to comfortably accommodate all staff
- Staff is in multiple buildings (decentralized)
- Storage of equipment
- Decentralized storage
- Separate building that houses employees
- Lockers for women
- Equipment for women, varied sizes
- Limited meeting space and office space
- Chemical storage safety
- Worker safety - working alone at night or off-hours
- Chemical storage
- Access after-hours and Emergency call-in
- Crosswalk to lagoon area
- Separation of staff leads to Ops vs Maintenance mindset
- Isolation of staff between buildings (Ops vs Maint vs Metrogro)
- Traffic - walking and biking combined with semi traffic
- Ease of access to parking
- Traffic-- through to lab (volunteer drop-off), for operators, hazards

- Access to parking, ADA, navigation of plant
- Communication - PA system upgrades, Emergency Alert system
- Distance of travel to move equipment and chemicals
- Shipping and receiving/mail-- all deliveries
- Health and wellness spaces for staff: outdoor tables, trails, etc
- Safe walking space on roads or separate paths

Yellow (Innovation and Learning):

- Training area: forklift, vehicle areas not on road
- Priority of strategic performance areas
- Collaborate + shared workspaces
- Shop One is underutilized
- Storage area in "wood shop" underutilized
- LEED Design: natural light for all
- No answer as to what the security plan is - where does the fence go? What is inside and what is outside?
- Rehab part of building does not get upgrade?
- District as landlord
- Houses we manage on campus
- No cohesive plan on to where buildings should go
- Welcoming experience "Environmental Park"
- Use of space outside of plant campus

7. OTHER ITEMS (Not included in a Plan or CIP)
    a. Meeting Rooms
        i. Commissioning Meeting Room in Maintenance Building is set up and torn down for each type of meeting that happens in that space. Tailored for each meeting.
        ii. Need to have a better meeting space for plant meetings. The only space big enough right now is the garage.
        iii. No central location for flow of tour groups, public education
    b. Access and Wayfinding
        i. No secured entrance (free flow of vehicles/people in and out of plant)
        ii. No command center
        iii. Haulers, vendors, delivery drivers, and visitors have a challenging time knowing where to go.
        iv. Only one address for the entire plant. How do emergency vehicles know where to go?
        v. Fog – happens regularly and affects visibility, safety
        vi. No crosswalk to lagoon area
        vii. Most buildings are unlocked. Only the operators have badge access.
        viii. General circulation
            1. Roads are narrow and large semis pass each other regularly
            2. Blind spots!
            3. Speed can be a concern
            4. Where do peds/bikes go?
        ix. Gate 1: closed due to damage
        x. **Gate 2:** major entry point for staff, visitors, vendors, haulers, MG&E access, and deliveries.
        xi. Gate 3: closed once Gate 4 was installed with Maintenance Facility

xii. **Gate 4:** major entry point for staff, visitors, vendors, haulers, Metrogro, and deliveries.
    1. The majority of hauler and delivery traffic enters the plant here.
    2. Traffic gets stopped and backed up when a delivery truck backs up to the dock at the Maintenance Facility.
xiii. Additional access for residential house – sometimes left open

c. Metrogro
    i. Staff tend to be isolated and left out of discussions or meetings.
    ii. They are part of the maintenance group.
    iii. This is partially due to Metrogro being across the street.
d. Personal Storage/Wellness
    i. Lack of lockers, some of the female staff have given theirs up for other females to use.
    ii. Maintenance Building: 54 male lockers, 6 female lockers
    iii. Field operators/ workers get two lockers.
    iv. Wellness room at the Maintenance Facility, low-key workout space in Ops bldg. (dungeon-like space)
e. Plant Storage
    i. Chemicals stored through-out, sometime in not ideal locations
    ii. Storage is spread through-out, inefficient use of time moving about the plant to find things
    iii. “ghost” inventory: storage of items not essential to plant function, not inventoried stock
    iv. Need for a chemical room where deliveries can be done close by
f. Communication system
    i. The system is outdated and does not reach all areas. after hours call-in is unsafe
g. Sustainability
    i. Buildings on campus to be LEED certified moving forward.
    ii. Need to be efficient with use of space.
h. Training Facilities
    i. Need a space for confined space training, operations, and plant process training
i. Operations Building
    i. First floor recently remodeled, ADA upgrades from parking lot to first floor
    ii. ADA access in basement isn’t ideal
    iii. Only 2 female lockers
j. Shop One
    i. Abundance of underutilized space.
    ii. Updated community room, remaining space has been mothballed.
    iii. Programming and event management
    iv. Not ADA accessible
k. Security
    i. What is inside/ what is outside the fence?
    ii. Consider removal of non-essential plant activities (residential uses, public education)
l. Three things to think about during plant tour:
    i. Shop One
    ii. Headworks (hauler circulation)
    iii. Operations (nerve center of campus)
    iv. We are not set up for tours

# MEETING NOTES

**To:** Attendees

**Copies To:**

**From:** Kathleen Anglo

**Date:** 11.21.2022

**Reference:** MMSD | Nine Springs Wastewater Treatment Plant
Capital Project Infrastructure Placement Plan – Workshop 01, Mtg 03

**TKDA Project No.** 20279.000

**Client No.**

On Nov. 16, 2022 at 8:30 am the following team members met at *Nine Springs Wastewater Treatment Plant* to review Communications/RT/Ecosystem Service needs for consideration for the Capital Project Infrastructure Placement Plan.

## MEETING ATTENDEES:

| Name | Organization/ Discipline | Email |
|---|---|---|
| MMSD Staff: | | |
| Eric Dundee | Project Champion \| Dir. Operations and Reliability | ericd@madsewer.org |
| Seth McClure | PM \| Strategic Performance and Policy Advisor | sethm@madsewer.org |
| Janelle Werner | Executive Coordinator | janellew@madsewer.org |
| Kathy Lake | Pollution Prevention Manager | kathyl@madsewer.org |
| Amanda Wegner | Communications and Public Affairs Manager | amandaw@madsewer.org |
| Martye Griffin | Dir. Ecosystem Services | marting@madsewer.org |
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| Amy Patterson | Civil Engineer | Amy.patterson@tkda.com |
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| Sam McKinney | Stakeholder Engagement | Samantha.mckinney@tkda.com |
| Dana Schumacher | Landscape Architect | Dana.schumacher@tkda.com |
| Brian Dunn | Electrical Engineer | Brian.dunn@tkda.com |

The following items were discussed.

1. Introductions
2. Work group location
    a. Operations building: Business Services 1st floor, Pollution Prevention 2nd floor.

3. Pollution Prevention
    a. Shop One: give tours, education, community events, etc.
    b. Ecosystems department includes lab and Pollution Prevention.
    c. Metrogro is partially under this group.
    d. Education = community engagement.

   e. Samples collected in the lab are primarily by volunteers. Approx. 30 volunteers along with rotating researchers
   f. Sample drop- off location is in the Operation building for lab.
   g. Hauled waste is in multiple locations and some are outside the fence.
   h. Pretreat and waste coordinator handles most of the hauled waste drop-off around campus.

4. Business Services and Communications
   a. Large Meeting room, Shop One and Maintenance Facility garage are for used meeting spaces.
   b. This team is the hub when people need to know what is going on around campus and is done out of the operations building
   c. Admin. Guidelines for security measures? Seth will release to TKDA.
   d. They are super- users that understand how meeting spaces work.
   e. Maintenance Facility building and Shop One meeting rooms need to be ready to receive the public.
   f. Connection locations within meeting rooms don't work as well as should for functionality.

5. These two teams serve as "marketing" for the District and each have a lot of inventory and storage needs. There are items for display that go off-site and can use alternate storage location.

6. Location of personal and user groups are important.

7. Site location within the plant is not as important to where the user group is, but to be together.

8. Maintenance and operations are too far separated and engagement between the two divisions is preferred. Currently the campus has two hubs, not one.

9. Site navigation is a challenge. No street names and no wayfinding signage.
   a. Delivery location is confusing. RFP's are an issue for bidding when delivered to different locations.
   b. Business Services gets call for help to navigate users, but staff can't leave the Ops desk.
10. Would like to move Ped. and Bike traffic off the roadways.
   a. Look at walking loops that consider tour routes.
   b. MMSD will pass along tour routes to TKDA.

11. Business service has concerns RE: enough space to house staff. The team is a hub and would like to have team located in same building. Review job roles/responsibilities.
12. Security:
   a. Some buildings have keys and others have card access.
   b. One person is security for Business Service.
   c. Some staff may be uncomfortable in a Security role or when working alone.
   d. Many are people out on work orders through the day and very few are around campus.
   e. Cell service doesn't work well in tunnels.
   f. If a security guard shack is proposed, then consider the vehicle queueing space needed for haulers and deliveries off the main road.
13. There are now multiple workflows in place for the hybrid workforce, this can make some work responsibilities challenging.

14. Large event space and space for tours are a needed along with a welcoming front door to the plant.
   a. Things have changed to educate the community regarding the plant processes vs. staying hidden.
   b. School tours may have up to 200 kids at one Time. Many times it's just a class of 20-30.
   c. Small group tours happen regularly.
   d. School buses pull-in and drop-off students at Shop One. (where should they park?)

e. They identify or ask for volunteers for tour specific types. Ideal would be to start and end at Shop One. Plant is not set up for a fully accessible tour. Currently the start point of a tour can change due to type of tour.

15. Key focus across campus is to get to a “we” and not so much as an “us and them”.

16. Meeting space, multipurpose room on first floor of operations building is the one space to use currently.
    a. Could use more meeting rooms like this, with up-to-date A/V equipment. Current sound quality in this room is poor.
    b. However sound quality from this room is poor.

17. Current work environment is not ideal for Business Services because they are a hub and they provide support to the district.
    a. They are on the phone most of the day.
    b. Need more space for future growth.
    c. HVAC needs improvements in current areas.
    d. Office supplies and back office items are scattered and should to be centralized.

**The above represents the writer’s understanding of the meeting. Any errors, omission, and/or discrepancies should be reported to him/her promptly.**

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# MEETING NOTES

**To:** Attendees

**Copies To:**

**From:** Kathleen Anglo

**Date:** 11.21.2022

**Reference:** MMSD | Nine Springs Wastewater Treatment Plant

Capital Project Infrastructure Placement Plan – Workshop 01, Mtg 04

**TKDA Project No.** 20279.000

**Client No.**

On Nov. 16, 2022 at 10:30am the following team members met at *Nine Springs Wastewater Treatment Plant* to review Operations/IT/Engineering needs for consideration for the Capital Project Infrastructure Placement Plan.

## MEETING ATTENDEES:

| Name | Organization/ Discipline | Email |
|---|---|---|
| MMSD Staff: | | |
| Eric Dundee | Project Champion \| Dir. Operations and Reliability | ericd@madsewer.org |
| Seth McClure | PM \| Strategic Performance and Policy Advisor | sethm@madsewer.org |
| Alan Grooms | Operations Manager | alang@madsewer.org |
| Michelle Stranksy | Purchasing and Inventory Assistant | michelles@madsewer.org |
| Lisa Coleman | Director of Engineering | lisac@madsewer.org |
| Brady Lessner | Facility Maintenance Supervisor | bradyl@madsewer.org |
| Mickey Bowman | Network Administrator (IT) | michaelb@madsewer.org |
| Ben Seibel | Network Administrator (IT) | bense@madsewer.org |
| Matt Schuman | Reliability Process Manager | matthews@madsewer.org |
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| Kathleen Anglo | PM \| Landscape Architect | Kathleen.anglo@tkda.com |
| Ben Olson | Project Architect | Benjamin.olson@tkda.com |
| Josh Elder | Architectural Technician | Josh.elder@tkda.com |
| Dan Nesler | Wastewater Engineer | Daniel.nesler@tkda.com |
| Amy Patterson | Civil Engineer | Amy.patterson@tkda.com |
| Jeannine Clancy | Project Advisor \| Strategic Communications | Jeannine.clancy@tkda.com |
| Sam McKinney | Stakeholder Engagement | Samantha.mckinney@tkda.com |
| Dana Schumacher | Landscape Architect | Dana.schumacher@tkda.com |
| Brian Dunn | Electrical Engineer | Brian.dunn@tkda.com |

The following items were discussed.

1. Introductions
2. IT and Programming (Ben and Mickey)
    a. Our strength is our people, long-term employees
    b. Data Centers in operations building and at Metrogro.
    c. Have switches in 20 additional buildings across campus.

d. Two separate networks: “operation and control” and then everything else.
e. Responsible for A/V setup in meeting rooms.
f. Prefer offices over cubes, but do not mind break out areas.
g. Currently they are not close to others for collaboration with other departments.
h. Lack storage areas.
i. Most work/people connection between operations and maintenance Buildings.
j. Dedicated UPS and back-up generator.
k. Lack fire suppression.

3. Engineering (Lisa)
    a. Located in Operations Building.
    b. Prefer offices for space needs and closets for items in the field.
    c. Personnel are on construction sites or in offices. In the field during warmer months and in the office during colder months.
    d. No expansion space available for additional staff.
    e. The current office size is sufficient; cube spaces are small.
    f. The engineers prefer to be isolated, have quiet space to work out complex problems. Offices with doors preferred.

4. Planning/purchasing does inventory management across the district (Michelle)
    a. Manages deliveries and does the work orders.
    b. Currently inventory is spread across the plant, at the Maintenance Facility (SW corner) and in the storage areas in the NE corner.
    c. All work order picks are done on paper, not electronic. Automated would be good.
    d. Preference is to have inventory at one location on campus, at one level and accessible.
    e. Freight dock in the Maintenance Facility is too small (inside) for unloading/stacking purposes.
    f. Concerns about delivery locations and inconsistent security measures throughout the plant.

5. Operations (Alan)
    a. Works with IT and programming.
    b. Coordinates with Engineering and small project needs.
    c. Good central work area in new Maintenance Facility (open worktables), but space is limited for expansion.
    d. Want to have better access for tool locations to do the job near the location of primary use, but not to be as visible. However, it needs to be identified for location.
    e. Need a better system for storage of large bulk bag items and chemicals that cannot be out in the elements. Storage space is insufficient. Struvite pallets and bags are tucked in multiple locations.
    f. The layout of campus is inefficient, and roadways are narrow.

6. Facilities maintenance (Brady)
    a. Roles include domestic plumbing, small engine, small internal construction, ground keeping at campus and 18 lift stations.
    b. Those are served by the storage buildings and areas scattered.
    c. Strengths of the department are the crew members themselves.
    d. Planning and scheduling for items needed to complete a job is poor. Again, items are still scattered and not in one spot to grab to complete the job and it would be ideal.
    e. In process orders use WAM scheduler for CMS.
    f. Regarding efficiency they are supplying redundant tools from two separate locations and not a central location, which is what would be preferred. The second option would be purchasing items in one location and campus storage into one location.
    g. Mechanics perform daily fleet vehicle maintenance in Storage 2 building.

7. General Concerns

a. Access/Circulation
    i. Would like to see a separate entrance for haulers and staff/visitors.
    ii. Gate 3 has a bus stop but is closed due to new Gate 4.
    iii. Haulers liked entering through Gate 3 due to drivability and of lack congestion to various locations.
    iv. Concerns about delivery locations and inconsistent security measures throughout the plant.
    v. Need wayfinding.
    vi. Additional storage for inventory should be located near Maintenance Facility Building-off Gate 3 for convenient delivery access.
    vii. Provide more car charging locations, even if it must be paid for by the employee.

b. Operations Building
    i. Like the operations break room, lack of meeting room spaces.
    ii. Would like to see a few personal phone rooms for those that work in cubes and need to take a private call.
    iii. Like having lockers and showers places to clean up. Lockers are running out in operations building for both genders.
    iv. More would use workout if in a more inviting location and space.

c. Maintenance Facility Building
    i. Appreciate that staff have their own workstation.
    ii. Good breakroom.
    iii. Need a large meeting space for all-staff meetings, currently using the truck bay garage.
    iv. The building is to last 50 years and is running out of workstations, lockers, storage, and garage space.

**The above represents the writer's understanding of the meeting. Any errors, omission, and/or discrepancies should be reported to him/her promptly.**

JE: kwa

# MEETING NOTES

**To:** Attendees

**Copies To:**

**From:** Kathleen Anglo

**Date:** 11.21.2022

**Reference:** MMSD | Nine Springs Wastewater Treatment Plant
Capital Project Infrastructure Placement Plan – Workshop 01, Mtg 04

**TKDA Project No.** 20279.000

**Client No.**

On Nov. 16, 2022 at 10:30am the following team members met at *Nine Springs Wastewater Treatment Plant* to review Operations/IT/Engineering needs for consideration for the Capital Project Infrastructure Placement Plan.

## MEETING ATTENDEES:

| Name | Organization/ Discipline | Email |
|---|---|---|
| MMSD Staff: | | |
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| Martye Griffin | Ecosystem Services | marting@madsewer.org |
| Matt Seib | Process and Research Engineer | matts@madsewer.org |
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| TKDA Staff: | | |
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| Dana Schumacher | Landscape Architect | Dana.schumacher@tkda.com |
| Brian Dunn | Electrical Engineer | Brian.dunn@tkda.com |

The following items were discussed.

1. Introductions
2. Process Operations
    a. Campus is not laid out well to go from one process to the next.
    b. Sludge processing (MetroGro) utilizes two locations, could be consolidated into one.
    c. Look at alternate locations for hauling, not in the best location now. Limited loading capabilities.

3. Records
    a. Record locations are in multiple locations and challenging to keep track.
    b. Consolidation would be good.
    c. Many do not know some exist.
    d. Should archive process be changed from paper to digital?

4. Maintenance
    a. Maintenance Facility Building is too small, no charging facilities.
    b. Inventory is scattered across campus and could be consolidated.
    c. Lack of garage storage that is protected, covered.
    d. Would like to have equipment in one area along with mechanics.

5. Lab
    a. The current space on the first floor of operations is sufficient.
    b. Limited expansion capability if additional lab space is needed due to district or regulatory requirements in the future.
    c. The lab could have better ventilation and air flow.
    d. Limited hood space.
    e. Lab workers are on top of each other during the summer (summer interns)
    f. Lost walk-in incubator in remodel. Now have a stand-alone incubator that is loud (located outside of Lab Manager's office)
    g. Locating items to lab storage is challenging.
    h. The lab should NOT be near the cafeteria. What if we drop/spill chemicals while walking through?
    i. Prefer private offices

6. Visitors/Tours
    a. There is not one good tour route over the campus, tours should be more consistent.
    b. The current lab is not set up for tours.
    c. Shop One is a challenge to receive tour groups as it is now.

7. Operations Building
    a. Should this be moved? Towards the perimeter.
    b. Limit access to the heart of the plant both for employees, visitors, haulers, etc.
    c. Move people spaces to edges of campus (public vs. private functions)
    d. Operations building removed, could provide location for heat and power improvement project in lieu of by head works area.
    e. Operations are on site 80% of the time.
        i. Operations and Engineering prefer private working areas, but they do not necessarily need to be dedicated spaces for each staff member.
    f. Building Spaces could be better utilized across campus for employee and business usage.

8. Access/Circulation
    a. Campus has Wayfinding and parking issues.
    b. Move septic hauling and receiving to the outer limits of campus.
    c. Connect the tunnels for easier access across campus, especially in the colder months.
        i. Reference to Green Bay being all underground.
    d. Physical space is limited for expansion.
    e. Safety access is a concern to rooms, bldgs., and the overall campus.
    f. Accessibility complacency has limited movement of groups to other locations on campus.

9. Storage
    a. Do not have adequate facilities to store all chemicals.

b. Location of storage isn't as important as having the physical indoor space required.
c. Delivery location depends on the chemical being delivered.
d. Need more storage in Struvite Harvesting Building.
e. Need a space for lubricant storage on site.
    i. Currently placed in old Headworks bldg (Storage Building No. 3)

10. Maintenance Facility Building
    a. Would like expanded office space for technicians and common work areas.
    b. Need a larger space for all plant staff meetings or events (80 -100+ people)
        i. Community use.

11. General Plant Process Expansion
    a. Any process expansion should follow the topography for gravity flow through process (to the west). Wetlands will be an issue.
    b. Septage receiving building is in a bad place. Too much traffic. Move to the outer edge.
    c. Biosolids End Use facility and Metrogro could move to the outer edge, too.
    d. Chemical storage – proximity is not important but it would be nice to have it all in one place.

**The above represents the writer's understanding of the meeting. Any errors, omission, and/or discrepancies should be reported to him/her promptly.**

JE: kwa

# MEETING NOTES

To: Attendees

Copies To:

From: Kathleen Anglo

Date: 12.02.2022

Reference: MMSD | Nine Springs Wastewater Treatment Plant
Capital Project Infrastructure Placement Plan – Septage Receiving

TKDA Project No. 20279.000

Client No.

On Dec. 02, 2022 at 8:00 am the following team members met via Teams to review existing Septage Receiving operations for the Capital Project Infrastructure Placement Plan.

## MEETING ATTENDEES:

| Name | Organization/ Discipline | Email |
|---|---|---|
| MMSD Staff: | | |
| Eric Dundee | Project Champion \| Dir. Operations and Reliability | ericd@madsewer.org |
| Seth McClure | PM \| Strategic Performance and Policy Advisor | sethm@madsewer.org |
| Julie Maas | | juliem@madsewer.org |
| Martye Griffin | Dir. Ecosystems Services | marting@madsewer.org |
| TKDA Staff: | | |
| Kathleen Anglo | PM \| Landscape Architect | Kathleen.anglo@tkda.com |
| Ben Olson | Project Architect | Benjamin.olson@tkda.com |
| Amy Patterson | Civil Engineer | Amy.patterson@tkda.com |
| Jeannine Clancy | Project Advisor \| Strategic Communications | Jeannine.clancy@tkda.com |
| A-1 Sewer Service: | | |
| Lisa & Jim Thompson | Owners | A1sewerservice15@yahoo.com |
| | | |

The following items were discussed.

1. Background Information (O&M group): Eric
    a. Looking at the best location for septage receiving in the future.

2. Circulation/Use:
    a. Typical size, style, and number of trucks a day
        i. A-1 Haulers, 5 trucks daily (6-7 x/day) looking at around 60 trucks/day (2x includes Honeywagon)
        ii. Not expected to grow operations within the next year
        iii. Honey-Wagon (not in attendance @ meeting)
        iv. Two different types of trucks. 90% of A-1 trucks dispose out of the back



v. Tractor-trailer also dispose off the back end
vi. Different sizes of hoses for discharging (3", 4", 6")
vii. Largest truck is 7,000 gal. (different hauler)
viii. Trying to get away from the RV deliveries
    1. Haulers are getting calls from RV owners to come out and pump the RV for them
ix. Portable toilets can be discharged at the receiving area: issues with dump angles over the trench wall

b. Ingress and egress to the plant site (see markup on map)
    i. Typically enter/exit through Gate 1, conflicts with Metrogro @NW corner of site
    ii. Tight roadways, sometimes must pull off to let other trucks pass
    iii. Blind spots
    iv. Currently: Enter through Gate 4 and leave through Gate 2 (typically leave through Gate 1, but it's closed)

3. Operation Hours:
    a. Haulers work around each other
    b. A-1 works earlier in the mornings and others work later into the evening
    c. Weather and staffing affect arrival/delivery times
    d. Not a lot of waiting time (20 minutes, if 4-5 trucks are in front of you)
    e. 4-4:30 am arrival (A-1), other haulers show up later in the evening
    f. Emergency calls on weekends

g. Established operating hours: 6am -6pm M-F, gates are closed on the weekends, but staff will come and open gates
h. Plant will try to be as accommodating as possible: Gates open at 5am

4. Permits
   a. MMSD issues permits to haulers, establishes T&Cs on receiving waste, drivers, etc. Renewed once/year
   b. Only haulers who have a permit can bring waste to site

5. Delivery Area:
   a. Staging/queueing area: stage to the north of the dock
   b. Operations would like 3 bays (Eric)- in case 1 went down then 2 are still operational
   c. Grease can get mixed in with the septic waste and get trapped in the trench, more slope would be good
   d. Heated slabs to prevent freezing
   e. All flow goes to screens by gravity currently from the receiving trough
   f. Wall around trench can become a problem for haulers, based on dump angles (Jim has been hauling for 34 years)
      a. Hoses can get kinked
   g. Need to get portable toilet trucks to a separate spot, it's a tangled mess of hose
      a. They use a 3" hose, they leave a MESS
      b. Hoses and clean-up freezes and it becomes a safety issue
   h. Different area for catch-basin waste (sumps from a Vactor truck) is preferred so grit and larger debris does not get caught in the grease and to protect the screens
   . Lighting is good.
   a. The ramp is good, although it could be an even greater slope to help with emptying the trucks

6. Sampling:
   a. A-1 is fine with current sampling system
   b. Take a sample, leave it in the room with a fridge in the Headworks building

7. Amenities:
   a. Heated floor or ramp is preferred due to icy conditions in the winter when hosing down equipment
   b. Access to a restroom is a nice-to-have, handwashing station is required
   c. Hoses for clean-up is a must (although it gets icy in the winter)
   d. Inside a drive-thru building?
      1. 60 trucks/day - maintenance on overhead doors may be an issue if it's inside a building, but the heated space would be a nice-to-have
8. Misc Discussion
   a. Wildlife/birds in canopies - protected species/nesting times
      1. Solid canopies where the birds can't nest
   b. Two locations in the past 34 years, each location has only had 2 bays
   c. Prescreening
      1. Rock traps for grit and large debris
      2. Screen 4 gets beat up
      3. Equalized flow

d. Schedule for implementation: Design of liquid processing phase 3 is at least 3 years out (Jim and Lisa may be retired?)

**The above represents the writer's understanding of the meeting. Any errors, omission, and/or discrepancies should be reported to him/her promptly.**

# MEETING NOTES

**To:** Attendees

**Copies To:**

**From:** Kathleen Anglo

**Date:** 12.14.2022

**Reference:** MMSD | Nine Springs Wastewater Treatment Plant
Capital Project Infrastructure Placement Plan – Metrogro

**TKDA Project No.** 20279.000

**Client No.**

On Dec. 08, 2022 at 1:00 pm the following team members met via Teams to review existing Metrogro operations for the Capital Project Infrastructure Placement Plan.

## MEETING ATTENDEES:

| Name | Organization/ Discipline | Email |
|---|---|---|
| MMSD Staff: | | |
| Eric Dundee | Project Champion \| Dir. Operations and Reliability | ericd@madsewer.org |
| Seth McClure | PM \| Strategic Performance and Policy Advisor | sethm@madsewer.org |
| Zac Thompson | Metrogro | zacT@madsewer.org |
| Chad Liddicoat | Metrogro | chadL@madsewer.org |
| Ross Hollfelder | Metrogro | rossh@madsewer.org |
| TKDA Staff: | | |
| Kathleen Anglo | PM \| Landscape Architect | Kathleen.anglo@tkda.com |
| Amy Patterson | Civil Engineer | Amy.patterson@tkda.com |
| Jeannine Clancy | Project Advisor \| Strategic Communications | Jeannine.clancy@tkda.com |

The following items were discussed.

## Notes

1. **Introductions**

2. **Project Intro - Eric**
    a. About putting the puzzle pieces together (Plan and CIP recommendations aligned with efficient plant site design)
        i. Heat and power
        ii. Septage receiving/ headworks
        iii. Storage buildings (equipment, VLB)

3. **Metrogro 101**
    a. Vehicles:
        i. Applicators (8): Oxbo 5105 (36'L x 10'-5"W x 12'H) (3) and Ag-Chem (5)


metrogro

ii. Semi-tractor (6): Ford (4) and International (2)
iii. Tanker Trailers (17): Brenner (3), STE (6), Presvac (2) and IME (6)
iv. Nurse Tanks (4)
v. 12' Trailer with a water tank
vi. Future Fleet?
    1. Additional trailer in 2023
    2. Additional applicator toolbar in 2023

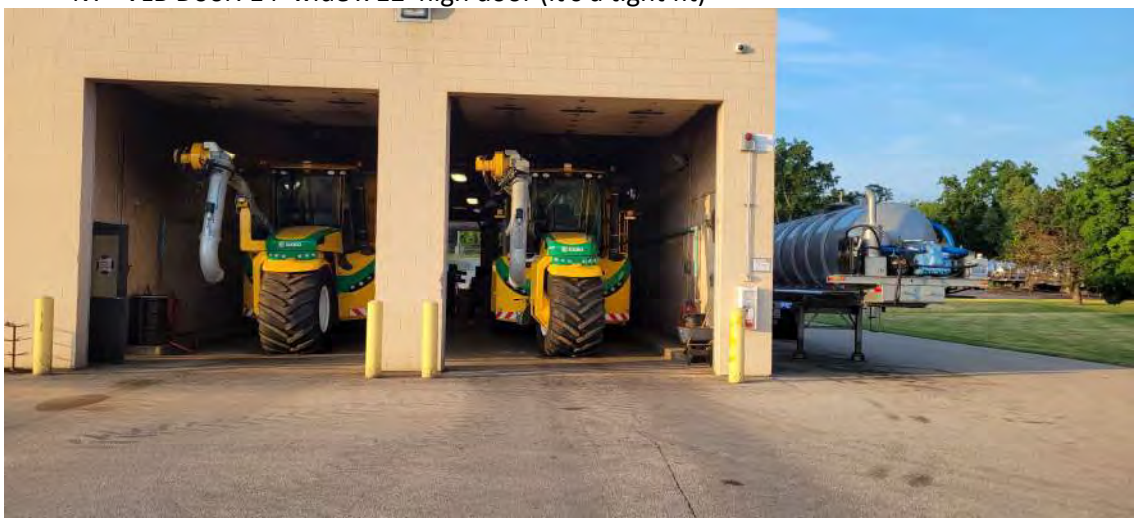
b. New applicator machines can load off a semi
c. In the off- season the nurse trailers are stored in the vehicle loading building (Metrogo VLB) parking lot. Nurse tanks are custom.
d. Nurse tank trailers can hold 2 semi-trailer loads (wide, tall and long) –
e. Mechanic trucks (2) fitted with fuel tanks + parts
f. Pick-up trucks (3)

2. **Months/Days/Hours of Operations:**
    a. All 17 semis come to VLB in the am, get orders and then either load at VLB or Metrogro pump station
    b. Loading:

i. Season (dependent on weather): April 5-10th thru first week in June, summer, then again late July - freeze-up (Thanksgiving)
ii. Hours: 6am - 6/6:30p (last load out at 6:30p)
iii. Days of Week: Haul 7 days/week in spring
    1. Summer: 5 days
    2. Falls: 7 days
    3. Will work weekends if it's wet during the week
    4. Can modify to later times if needed, but not desired
iv. Loading sites: 2 at VLB, 2 at Metrogro pump station (see below 3.)

c. Contractors: 17 contractors @ 10-12 trips per day per contractor = 170-204 trips daily
    i. Time between loads (vehicles stay within 30 miles of the plant) 45 minutes is a short round, 1.5 hours for a longer round
d. 4 maximum applications sites at a time
    i. If running 4 sites, each site uses their own trailer load out location (see 2.b.iv.)

3. **Loading Locations**
    a. VLB
        i. 2 loading sites (inside building)
        ii. Vacuum loading only
        iii. Only 8 trailers (pressure vac) can only load at VLB due to type of loading (suction to load-no pumping)
        iv. VLB Door: 14' wide x 12' high door (it's a tight fit)



        v. Video: https://youtu.be/wS2c6cvyWGM
        vi. VLB Bay: 43' long
        vii. The median in the drive aisles are difficult for the large trucks and equipment to maneuver around
        viii. Trucks often block the bike path and bicyclists are hard to see

    b. Metrogro (within plant site)
        i. 2 loading sites
        ii. All trucks can load here

iii. During colder months, have to heat piping and values with torches to use loading stations
iv. IDEAL if all loading was like this location (but inside like VLB)
v. Biosolids Management Plan shows two additional loading stations at this location

4. **Storage**
    a. General:
        i. Metrogro has no storage
        ii. VLB has limited storage
        iii. Spare tillages (zimmerman, conskill), tractor, mower (batwing mower with a plow equipment)
        iv. 3 rippers - would like a space for storage of spare parts
        v. Would like to have more storage space for older equipment stock/parts
        vi. Storage in mezzanine (but not convenient)
    b. Vehicles
        i. Generally, store machines everywhere they can
        ii. Parking to accommodate all of the semis in the morning @ VLB (could be up to 20) trucks park everywhere
        iii. Heated space to keep trailers warm during the colder months
        iv. Maint Facility can fit 6 trucks to keep warm so they don't freeze up
        v. Some contractors can take equipment home to keep warm, this is limited and not typical
    c. Flammables
        i. Used Oil storage: 1,000 gal.
            a. Used oils in the same room (oil waste cube) - needs vehicular access to extract used oil out the side of the bldg
            b. Oil room should be close to the shop, outside wall to extract used oil
        a. Fuel: 10,000 gal. fueling tanks
            a. Keep diesel and regular fuel separate but could consolidate locations to an extent. Don't want regular fuel dispensed instead of diesel and vice versa.

**5. Maintenance**
    a. Existing Maintenance is done inside the VLB
        i. (only 1 machine in the building at a time) - can't physically move around the applicator machines (Oxbo) to work on them
        ii. Not sufficient headroom or an overhead crane to get around the machines
        iii. Need a 35' wide bay to work around the injectors (Zimmerman)
    b. PREFER:
        i. Wide vehicle bays with large OH door
        ii. Storage to park 12-14 trailers, heated to 40 degrees (just keep it above freezing) – Could look at using heat from effluent?
        iii. Wash bay - all equipment needs to be washed - VLB is currently only building with wash bay. The rest of the plant is able to use the wash bay, but since the

nurse tanks have to be cleaned off immediately following use the bay isn't always available for everyone to use

iv. Crane with a 10- ton capacity

v. Load out at Metrogro is metered, but load out at VLB is done by operator's best judgement. A scale at each of the load out locations is desired. A shared weigh station would be ok, but would slow down the process and incur additional driver fees.

**6. Personnel Space**

a. Offices, maintenance

i. Its small, but it works. Bathrooms, shower (staff is on-site for little time)

ii. Years ago they would take lunch, but now they don't take lunch and work the contractors throughout the day

iii. Additional office space is needed for Metrogro staff in VLB and offices should be near each other

iv. Mechanics desks are out in the shop, which isn't ideal

v. Conditioned shop desired

b. Zach and Ross should be adjacent

**7. Security**

a. Current operator's rates are $120/hr, so waiting for a security gate to open would affect costs.

**The above represents the writer's understanding of the meeting. Any errors, omission, and/or discrepancies should be reported to him/her promptly.**

# Capital Project Infrastructure Placement Plan

WORKSHOP 02
JANUARY 31, 2023

Madison Metropolitan Sewerage District

# Agenda

**8:30 -10a** **Workshop 01 Recap and Discussion**

1. Introductions
2. Project Goals
3. Schedule
4. What we heard from Workshop 01 and questionnaire
5. Existing conditions
6. Draft Program
    a. CIP
    b. Staff Input

**10:00 -10:15a** **Break**

**10:15 – 11:30a** **Alternatives Presentation**

1. Evaluation Criteria
2. Options 1 -3

**1-2:30** **Alternatives Small Group Discussion**

1. Discuss each Option with regards to project goals and evaluation criteria

**2:30-2:50** **Break**

**2:50-4:00p** **Alternatives Review Report Back and Revisions**

1. Report back on small group discussions, Alternatives Pros/Cons
2. Revisions made during discussions
3. Final thoughts on Alternatives and Program

# Project Goals

1. Locate new infrastructure projects aligned with strategic priorities
2. Consider future infrastructure and maintenance needs
3. Allow for safe movement of staff and visitors

# Plan Considerations

- Growth in staff/ office space needs
- Modern office and IT needs
- Safety and security
- Public access

# The plan will…

- Consider general placement of program/strategic infrastructure priorities
- Provide planning level cost estimates

## The Plan won't…

- Design of buildings, initiatives, or efforts identified in approved plans that require additional investigation
- Analysis of alternatives identified in previous plans
- Financial impact analysis

# Success Criteria and Strategy…

## Strategic Performance Areas

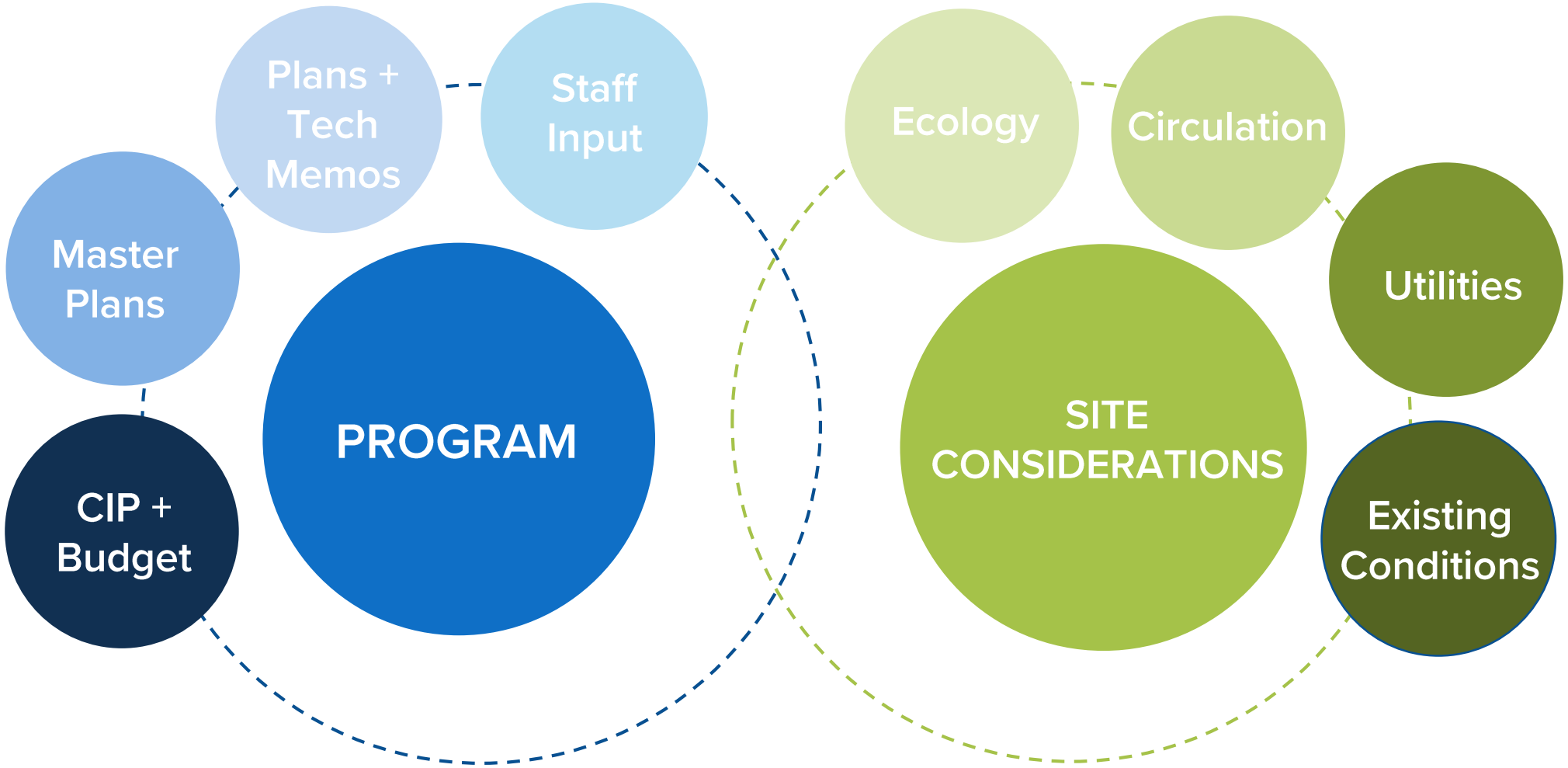

## What does Plan success look like?

- Helps prepare for the 2024 Capital Improvements Plan
- Is implementable, provides data-based information to guide decision-making
- Is relatable and easily presented

# Schedule


Organize/Review Background Info. Fall 2022
Project Introduction Workshop 01 Nov. 15-16, '22
Site Analysis/ Draft Alternatives
Alternative Analysis Workshop 02 Jan. 31, 2023
We are here
Alternatives Refinement February 2023
Final Alternative Review Workshop 03 TBD
Final Capital Project Infrastructure Placement Plan April 2023

# How do we start?

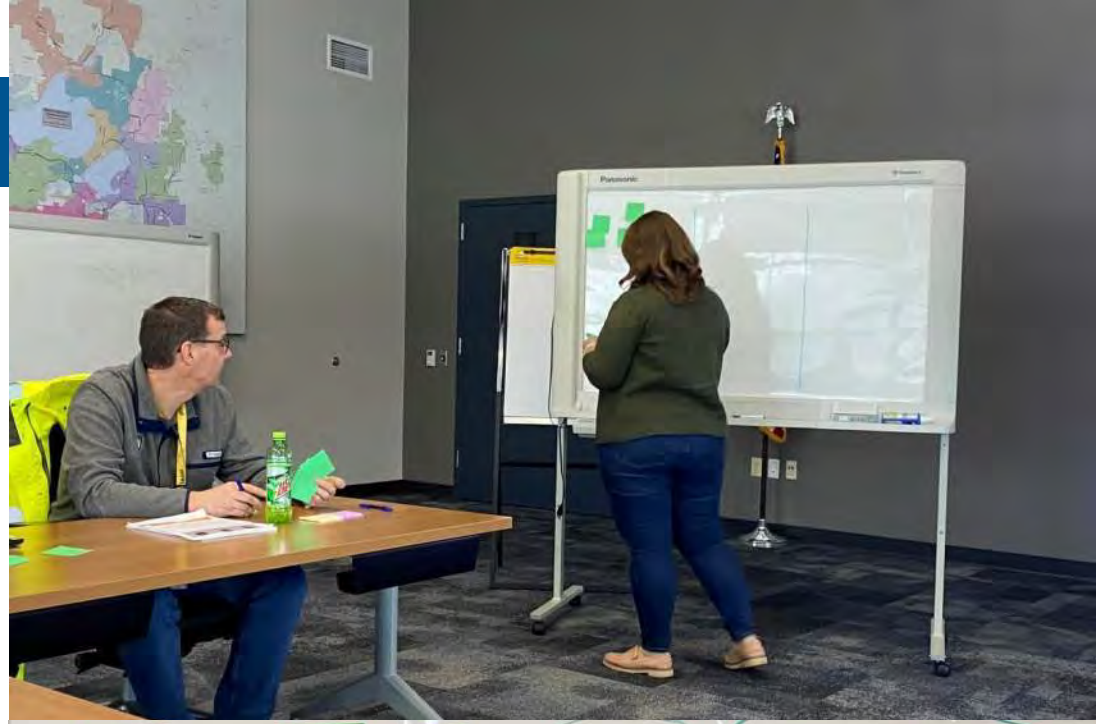


# Visioning Session

**Our Purpose**

Protect public health, welfare and the environment by providing efficient and strategic wastewater management on behalf of our owner communities.

| | To Our Customers<br>Customer Perspective | To Our Internal Processes<br>Internal Perspective | With Our Ability to Innovate<br>Innovation and Learning |
|---|---|---|---|
| What does a successful plan look like? | | | |
| What are the critical constraints? | | | |
| What are the physical requirements? | | | |

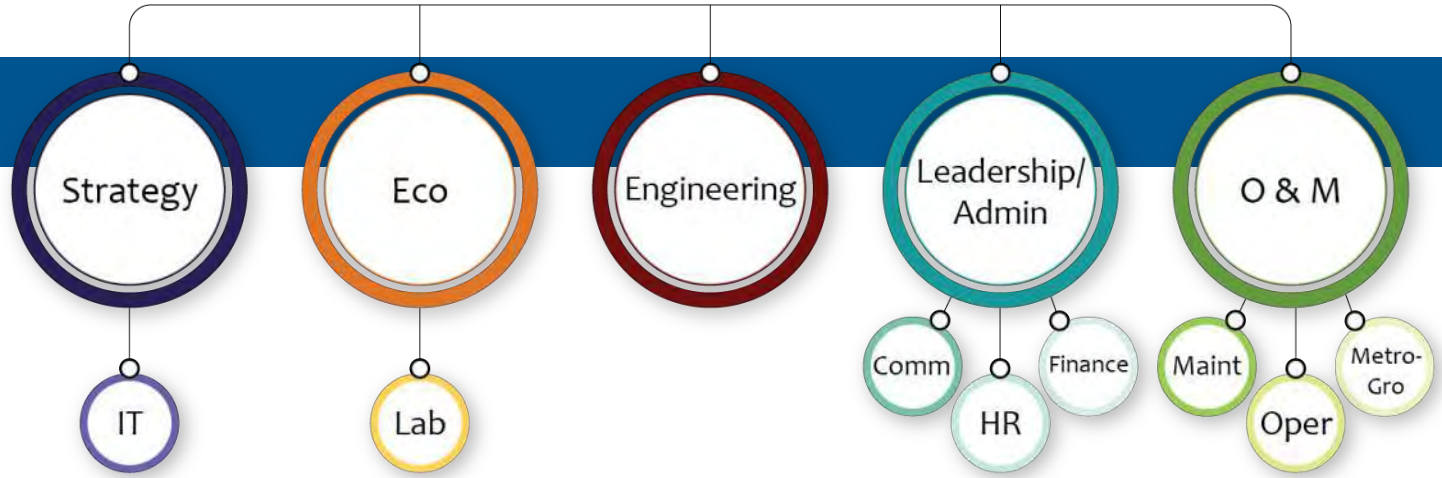


# What does success look like for our customer?

# What does success look like for internal processes?

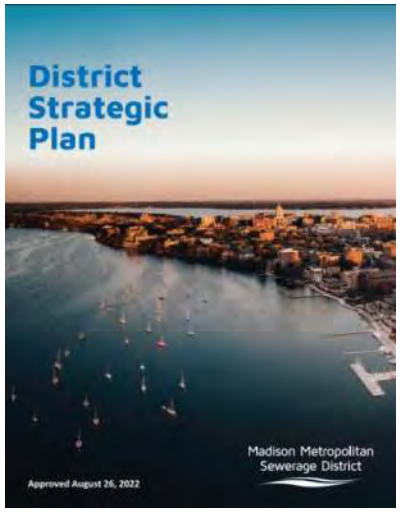
# Ability to innovate?

# Questionnaire

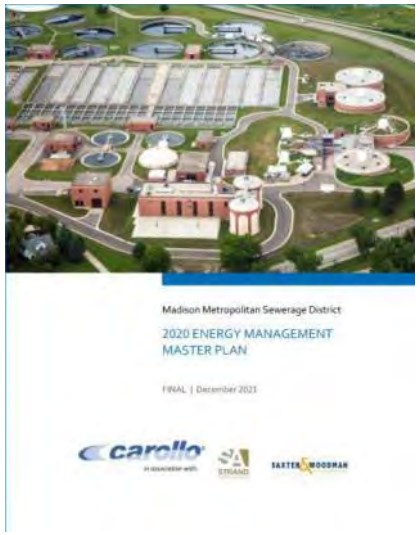



- No room for expansion (consistent comment)
- Storage is unsightly, lacking, or in the wrong place
- Separation of work spaces and congregating areas
- Upgrade health/wellness areas
- Separate public access and secured work areas – upgrade security
- Wayfinding!
- Upgrade IT infrastructure (meeting room design & set-up)
- Staff area comfort: views, break-out spaces, and natural light
- Need additional support spaces (lockers, PPE storage, appropriate chemical storage)

# PLANS, PLANS, PLANS







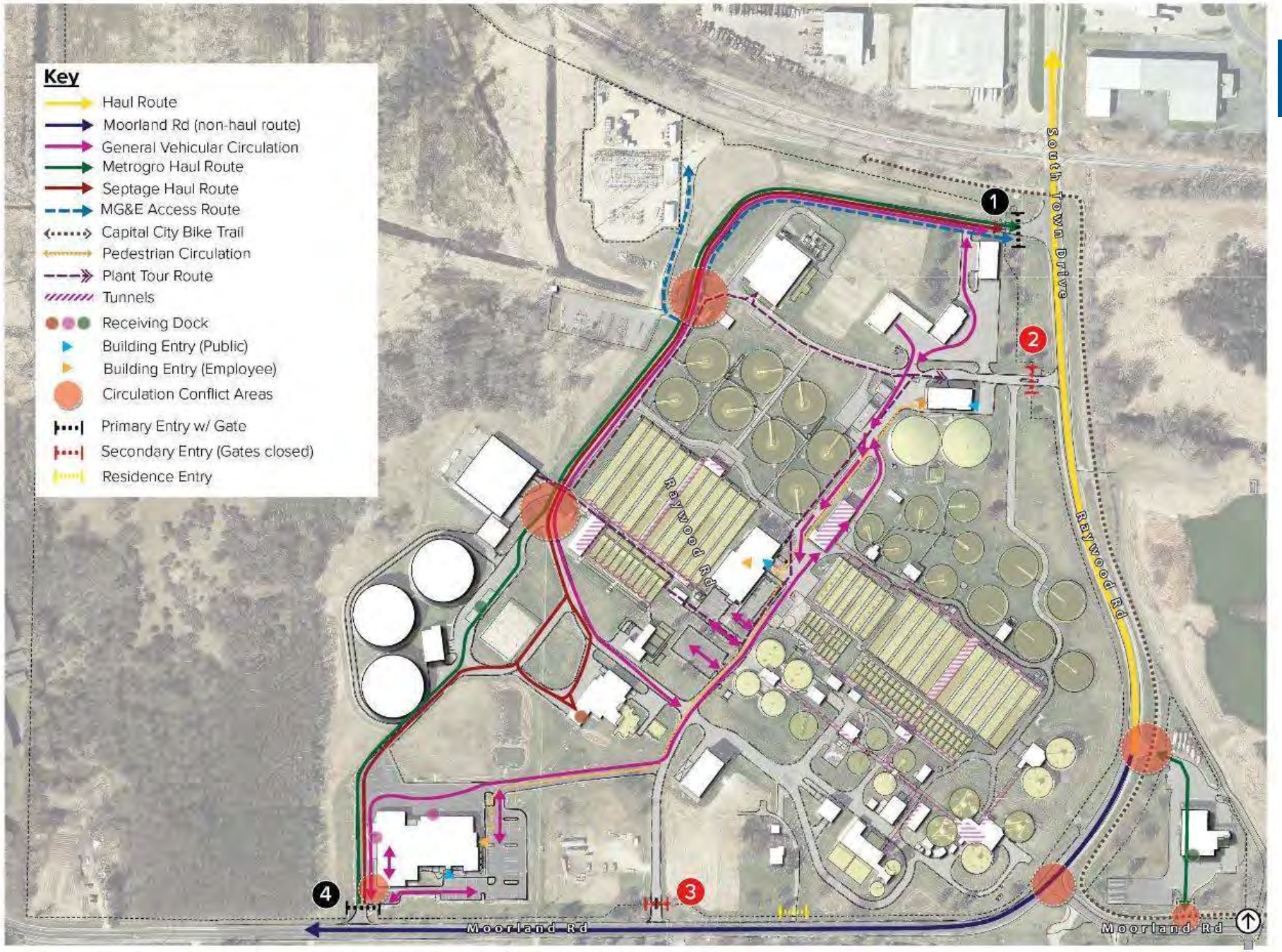

- 2016 Liquid Processing Facilities Plan: Septage Receiving Improvements and West Blowers Replacement
- Biosolids Management Plan: Metrogro Improvements
- 2020 Energy Master Plan: Heat and Power Improvements

# Site Context

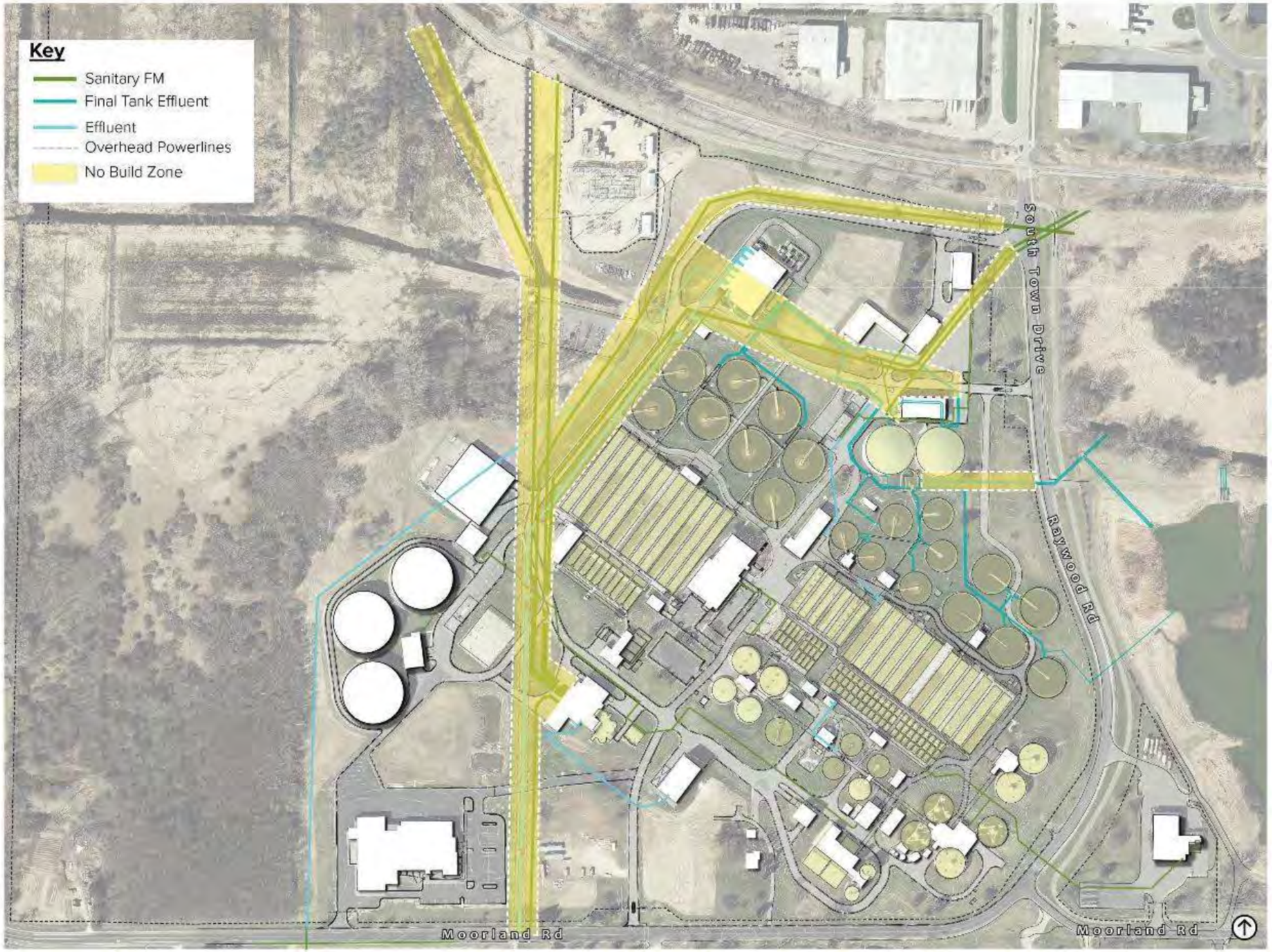
# Ecology


Key
Viewshed
High Point
Stormwater flow
Steep Slopes
Wetland
Woodland
South Town Drive
Raywood Rd
Moorland Rd
Moorland Rd

# Circulation



# Utilities


Key
Sanitary FM
Final Tank Effluent
Effluent
Overhead Powerlines
No Build Zone
South Town Drive
Raywood Rd
Moorland Rd
Moorland Rd

# Parking/Fleet Storage

**Fleet Storage**

| | |
|---|---|
| 1986 GMC | #468 Truck |
| 2018 New Holland | T5.110 |
| John Deere | End Loader |

**Metrogro Fleet Storage**

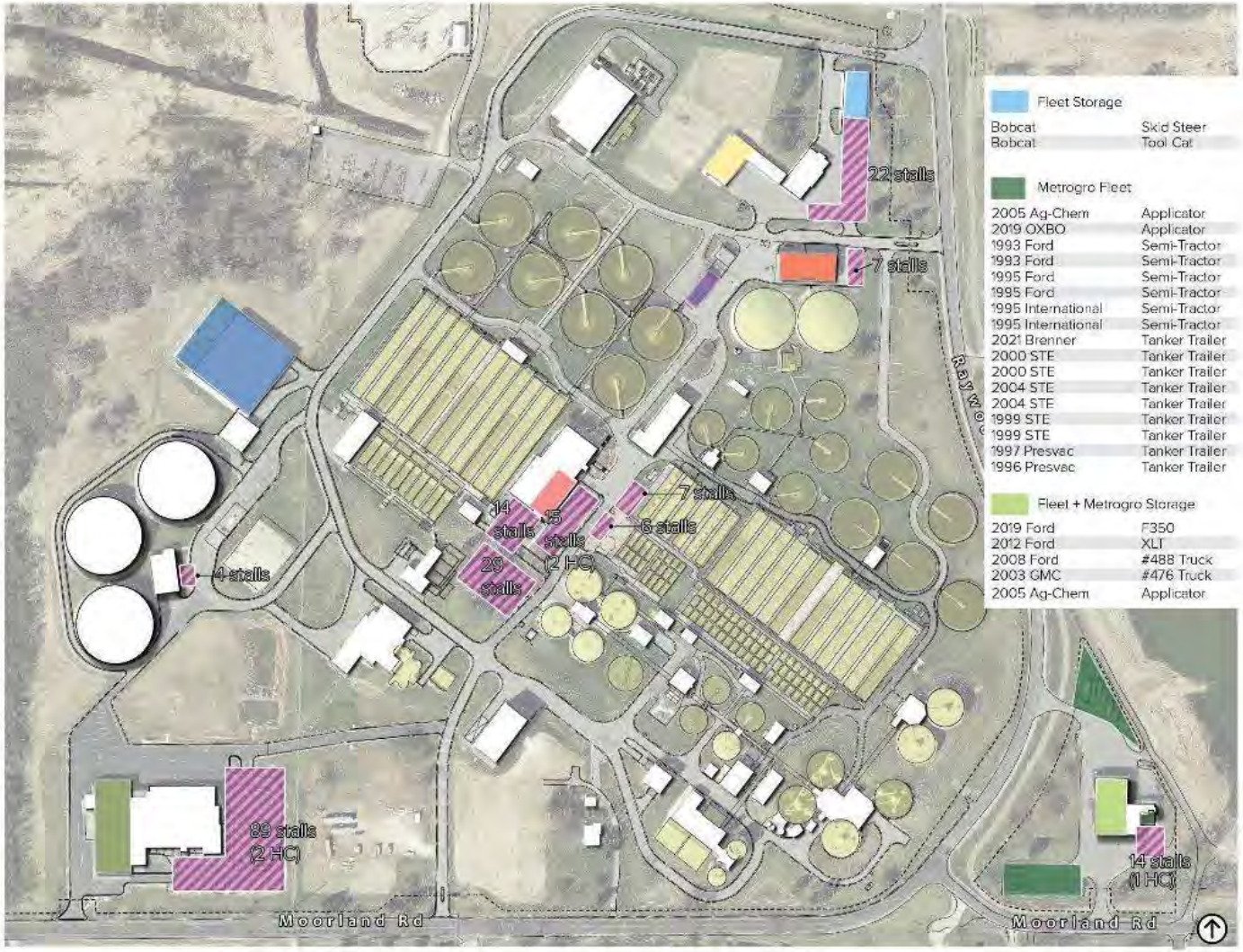
| | |
|---|---|
| 2021 OXBO | Applicator |
| 2004 Ag-Chem | Applicator |
| 2006 Ag-Chem | Applicator |
| 2008 Ag-Chem | Applicator |
| 2022 OXBO | Applicator |
| Unknown | Nurse Tank |
| Unknown | Nurse Tank |
| Unknown | Nurse Tank |
| Unknown | Nurse Tank |

**Fleet Storage**

| | |
|---|---|
| 2019 Ford | #497 F350 |
| 2012 Ford | #458 Truck |
| 2011 Ford | #453 Truck |
| 2016 Ford | F250 XL |
| 2019 Ford | #489 Pickup |
| 2017 Ford | Promaster |
| 2015 Ford | Transit Van |
| 2014 Ford | Econoline Van |
| 2008 Ford | #452 Truck |
| 2008 Ford | #451 Truck |
| 2012 Ford | Truck |
| 2009 Ford | #424 Van |
| 2005 GMC | #498 Truck |
| 2003 GMC | #467 Truck |
| 2019 Nissan | Frontier |
| 2019 Nissan | Frontier |
| 2020 Dodge | Ram 3500 |
| 2006 Dodge | #461 Caravan |
| 2017 Dodge | Van |
| 2020 Ram | 2500 |
| 2020 Nissan | NV200 SV |
| 2014 Ford | Transit Van |
| Electric Cars | 6 Total |

**Fleet Storage - Operations Below Parking Area**

| | |
|---|---|
| 2020 Dodge | Ram 1500 |
| 2004 Ford | #457 Truck |
| 2005 Chev | #421 Truck |
| 2005 Chev | #466 Van |
| 2008 Chev | #456 Truck |
| 2021 GMC | Canyon |
| 2016 Nissan | Leaf Electric Car |
| Electric Cars | 3 Total |




**Fleet Storage**

| | |
|---|---|
| Bobcat | Skid Steer |
| Bobcat | Tool Cat |

**Metrogro Fleet**

| | |
|---|---|
| 2005 Ag-Chem | Applicator |
| 2019 OXBO | Applicator |
| 1993 Ford | Semi-Tractor |
| 1993 Ford | Semi-Tractor |
| 1995 Ford | Semi-Tractor |
| 1995 Ford | Semi-Tractor |
| 1995 International | Semi-Tractor |
| 1995 International | Semi-Tractor |
| 2021 Brenner | Tanker Trailer |
| 2000 STE | Tanker Trailer |
| 2000 STE | Tanker Trailer |
| 2004 STE | Tanker Trailer |
| 2004 STE | Tanker Trailer |
| 1999 STE | Tanker Trailer |
| 1999 STE | Tanker Trailer |
| 1997 Presvac | Tanker Trailer |
| 1996 Presvac | Tanker Trailer |

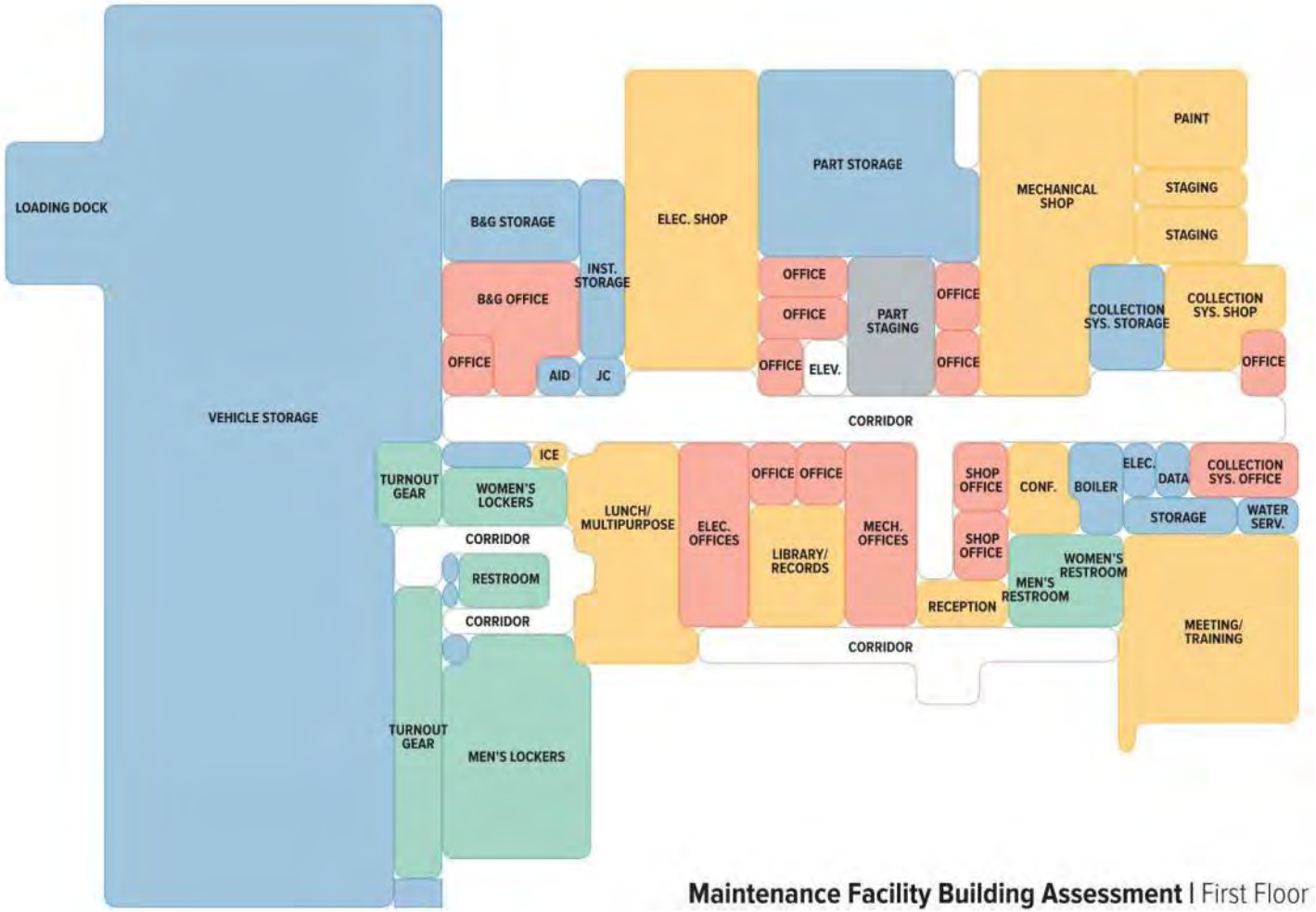
**Fleet + Metrogro Storage**

| | |
|---|---|
| 2019 Ford | F350 |
| 2012 Ford | XLT |
| 2008 Ford | #488 Truck |
| 2003 GMC | #476 Truck |
| 2005 Ag-Chem | Applicator |

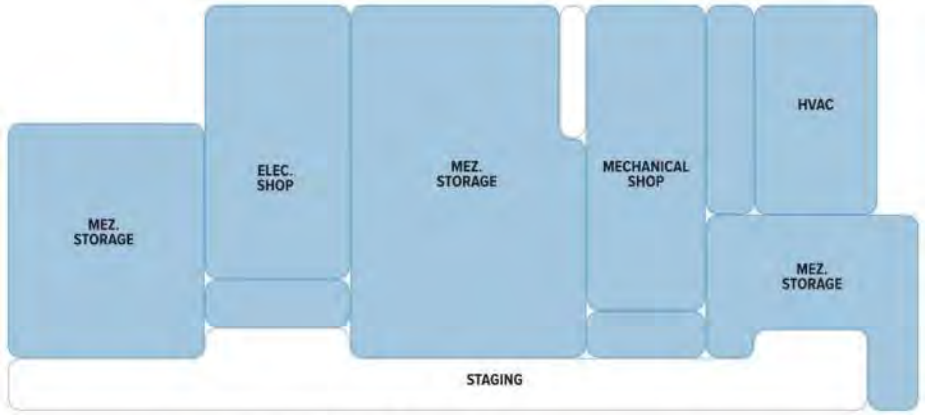
**Metrogro Fleet Storage (located in Pit Area)**

| | |
|---|---|
| 1980 IME | Tanker Trailer |
| 1980 IME | Tanker Trailer |
| 1980 IME | Tanker Trailer |
| 1980 IME | Tanker Trailer |
| 1980 IME | Tanker Trailer |
| 1980 IME | Tanker Trailer |
| 2010 Brenner | Tanker Trailer |
| 2022 Brenner | Tanker Trailer |

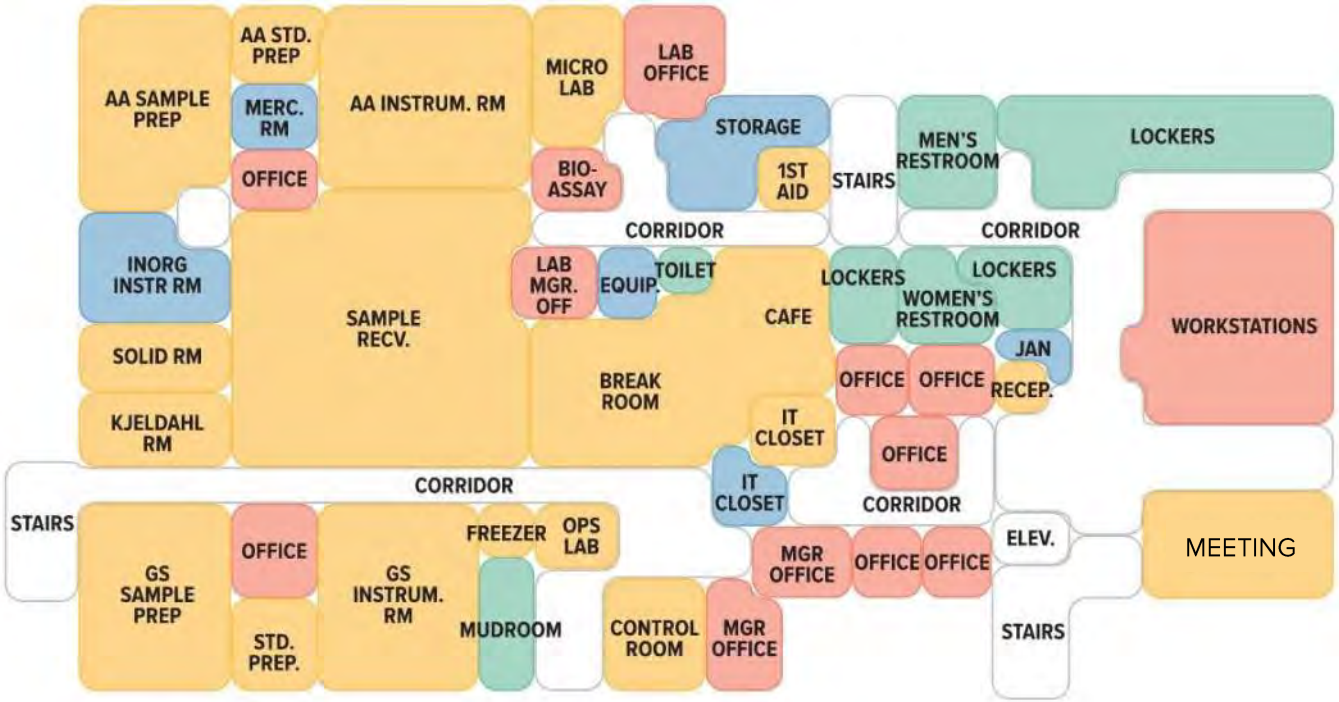
# Building Functions



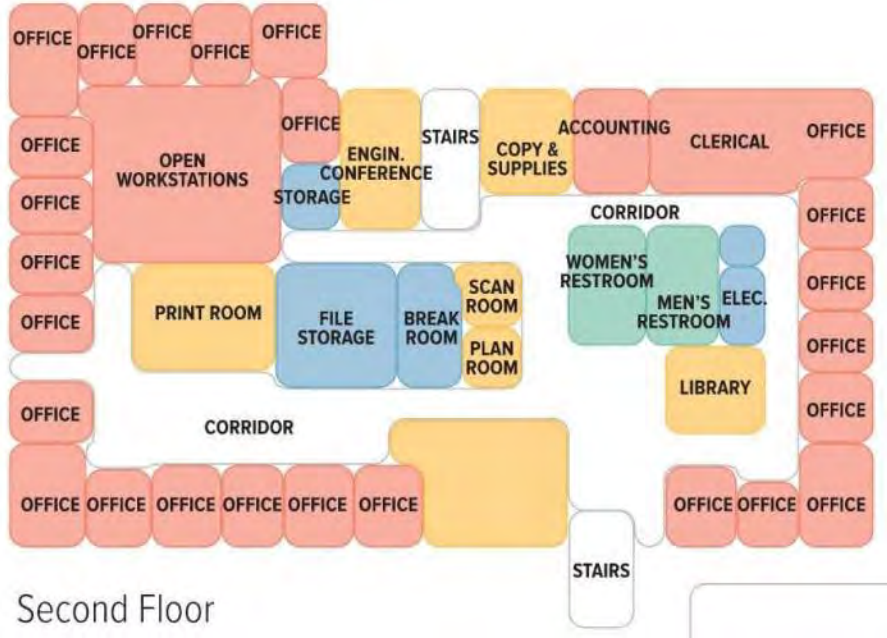

**Maintenance Facility Building Assessment** | First Floor



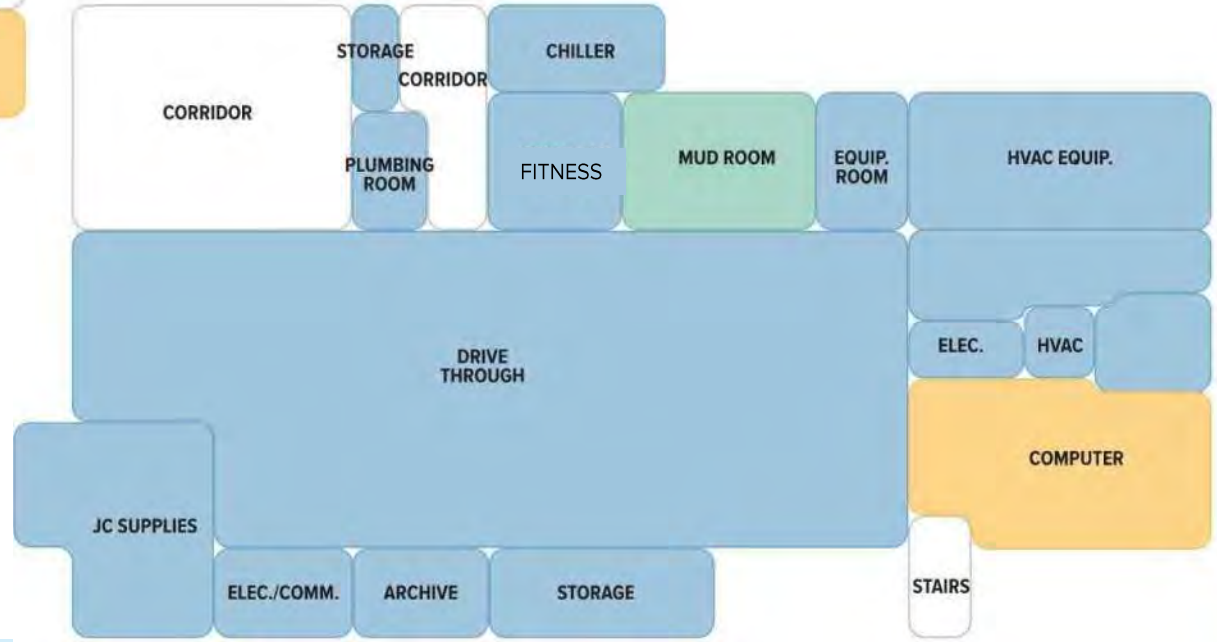

**Maintenance Facility Building Assessment** | Mezzanine



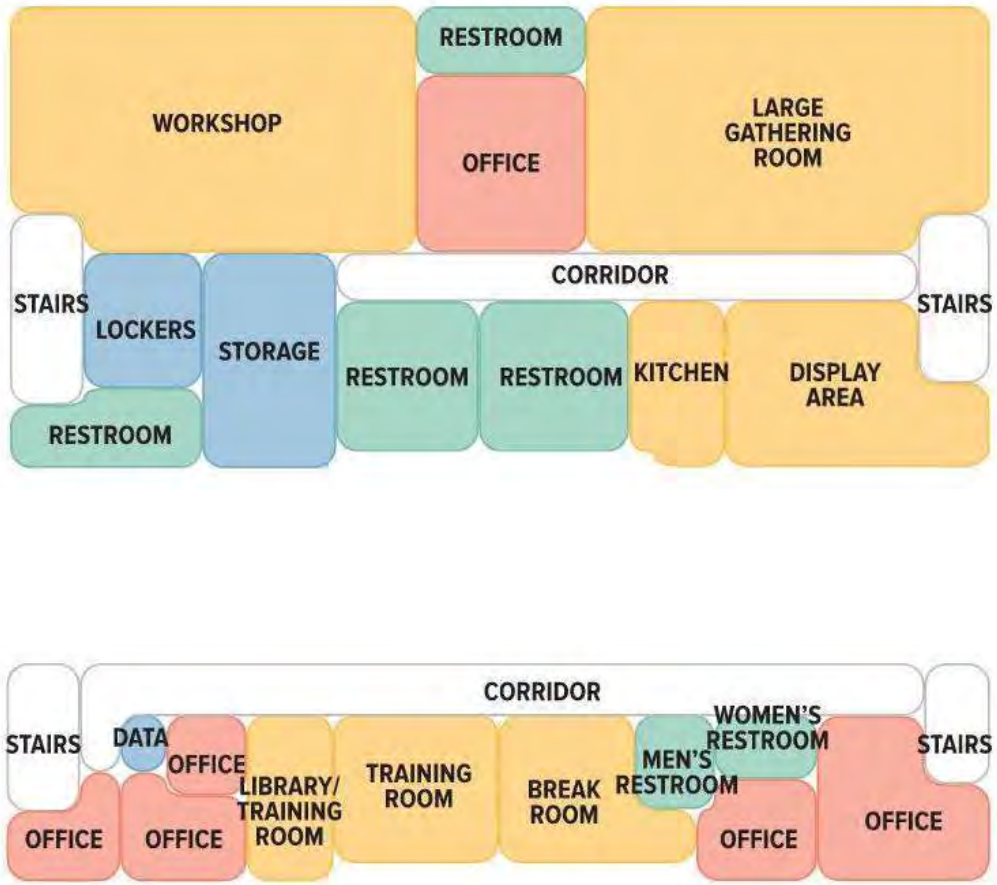

**Operations Building Assessment** | First Floor




Second Floor



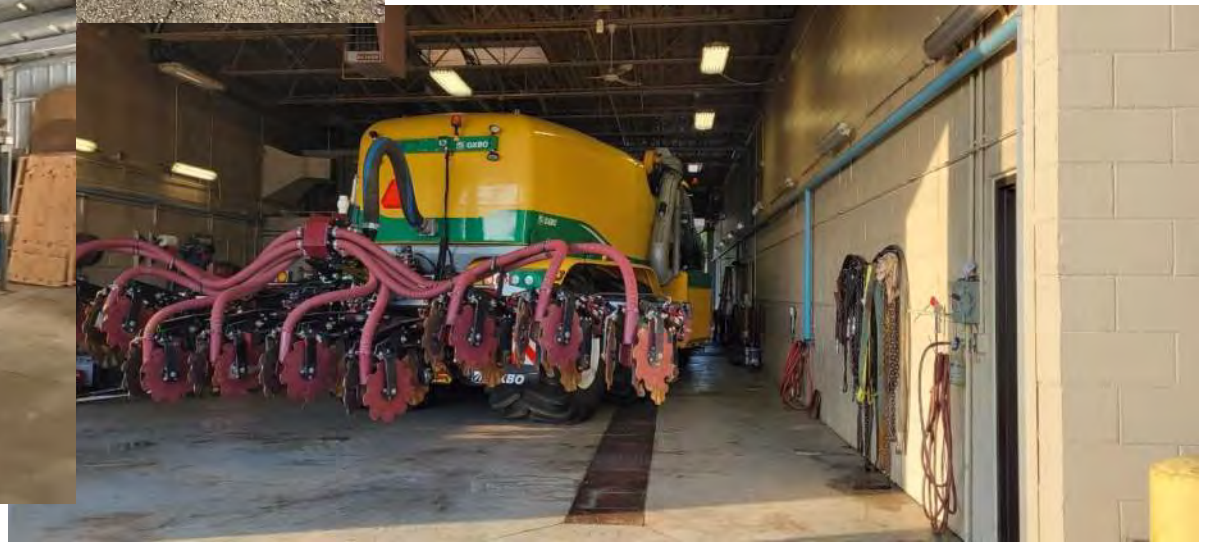

Basement




Shop One

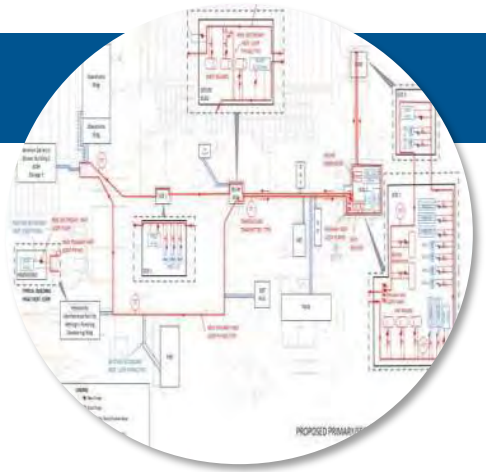

Vehicle Loading Building

# What did we hear?



# Program

West Blowers Replacement



Heat and Power Improvements

Septage Receiving Improvements

Metrogro Improvements

# Program

## Safety/Security Improvements

- Public Access
- Fencing


## Circulation Improvements

- Public Access/Uses
- Pedestrian/Vehicular

## Staff Workplace Improvements

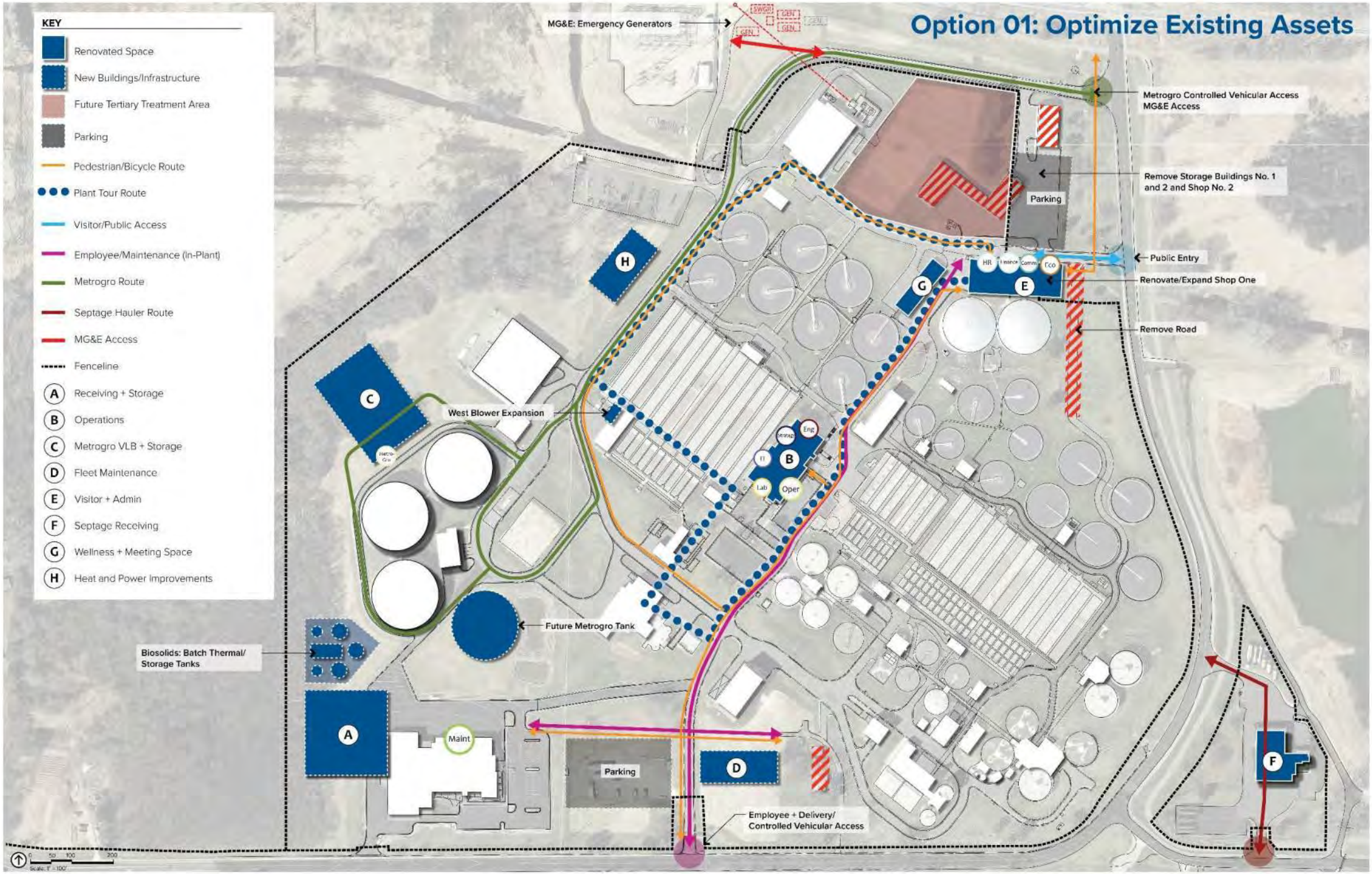
- Expanded work space, locker rooms
- Multi-purpose meeting rooms
- Wellness spaces
- Business services hub

## Storage

- Consolidation of inventory
- Chemicals
- Fleet


PLEASE
STAND BY

# Alternatives Review


Option 01: Optimize Existing Assets
KEY
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New Buildings/Infrastructure
Future Tertiary Treatment Area
Parking
Pedestrian/Bicycle Route
Plant Tour Route
Visitor/Public Access
Employee/Maintenance (In-Plant)
Metrogro Route
Septage Hauler Route
MG&E Access
Fenceline
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B Operations
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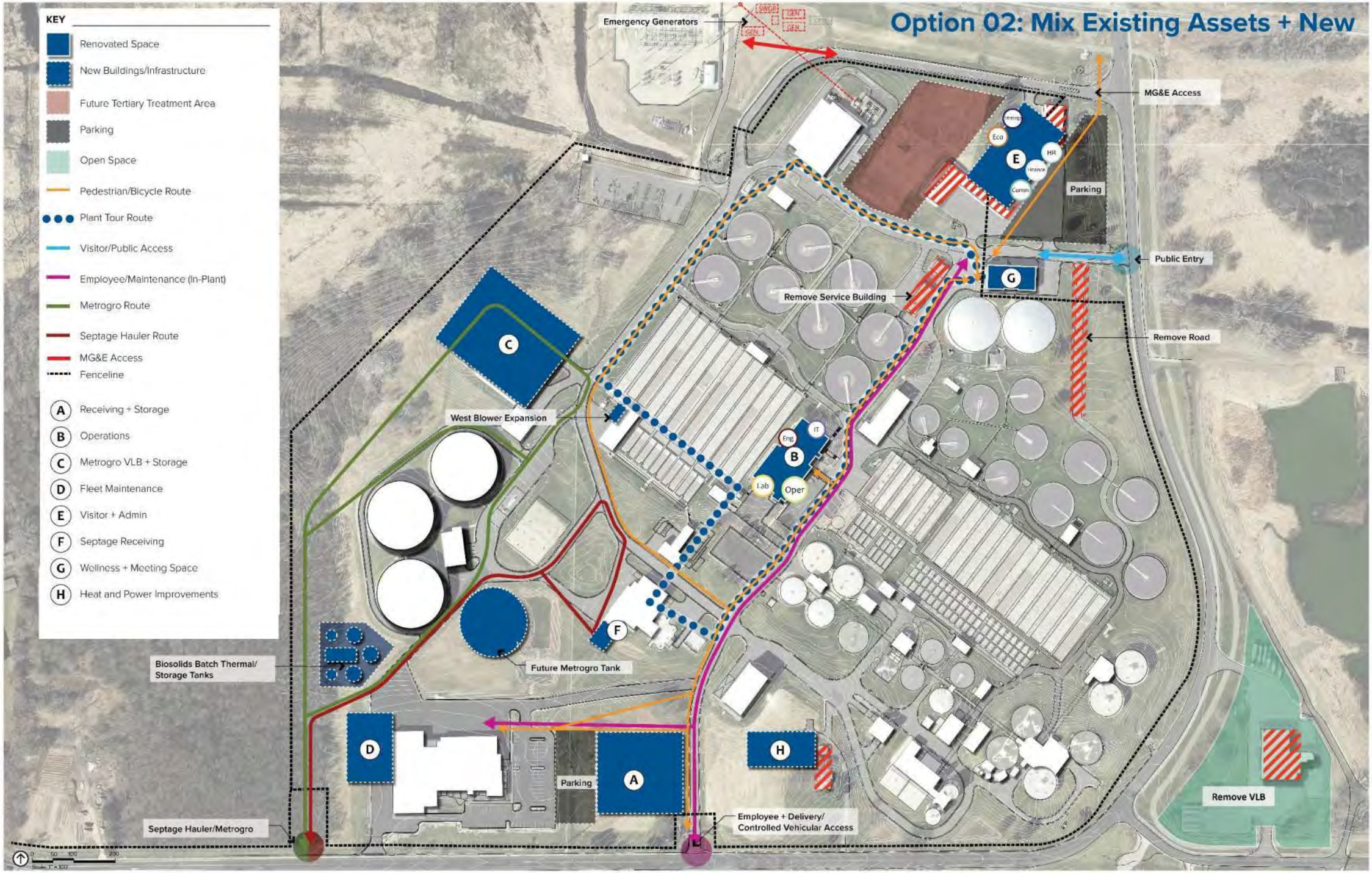
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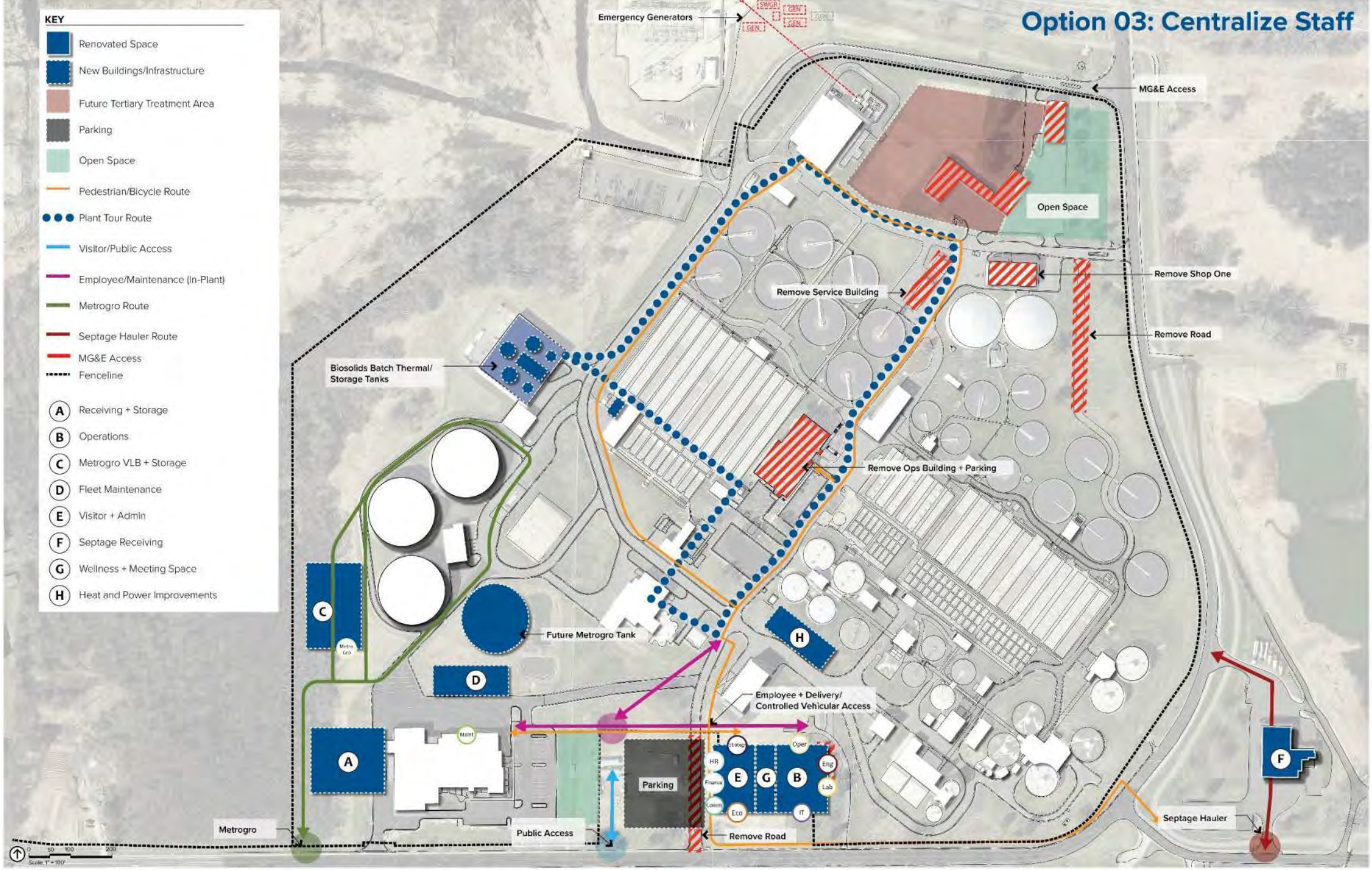
# Option 03: Centralize Staff




PLEASE
STAND BY

# Small Group Discussion

# Right activity/program in the right place?

- No build alternative?
- Workforce Development
  - Does this allow you to do your job more efficiently?
  - Are circulation conflicts addressed?
  - Enough storage?
  - Pros/cons if your work space moves? If it doesn't move?
- Public Trust
  - Is there a clear separation of public vs. plant functions?
  - Do the access points address security strategies?

# Small Group Feedback and Wrap-Up


Thank you!
TKDA

# CIP

CIP ID# **A01.4** West Blowers and Switchgear Replacement

**Start Date**
2022

**Completion Date**
2026

**Project Type**
Plant Improvements – Aeration System

**Location**
Nine Springs Wastewater Treatment Plant

**Description**
This project will replace the west blowers and associated medium-voltage switchgear. These facilities have been in operation for more than 35 years, and they are currently operating beyond their expected lifespan. This project was included in the 2016 Liquid Processing Facilities Plan. It is anticipated that the costs of the project will be funded through the Clean Water Fund.

**Background**
The 2016 Liquid Processing Facilities Plan recommended replacement of the west blowers using a phased approach. The plan called for two blowers to be replaced between 2020 and 2025, and the remaining blower and blower switchgear to be replaced shortly after 2024. Since the plan was developed, the condition of the blowers has deteriorated significantly, and one of the units is inoperable and requires costly repairs. Given the condition and criticality of this equipment, District operations staff is recommending that all three blowers and associated switchgear be replaced as soon as possible to ensure that this critical process continues to operate satisfactorily.

CIP ID# **A04.1** Heat and Power Improvements

**Start Date**
2025

**Completion Date**
2031

**Project Type**
Energy-Related Projects – Use Reduction/Generation

**Location**
Nine Springs Wastewater Treatment Plant

**Description**
The purpose of this project is to identify and replace aging assets associated with the District's energy-producing infrastructure and to optimize the use of energy going forward. These improvements will position the District to use its biogas to generate electricity on site at greater efficiency or to produce a biogas of pipeline quality that can be sold to others. This project was evaluated as part of the 2020 Energy Management Master Plan. Additional facility planning and design phases are expected to precede construction. It is anticipated that all project costs will be financed through a loan from the Clean Water Fund.

**Background**
An energy study was conducted in 2014 by Strand and Brown and Caldwell to provide a roadmap for how the District might achieve energy independence. Areas of focus included ways to reduce energy usage, improve utilization of digester gas and produce more energy. The 2020 master planning study expanded on all these areas and examined the most energy-efficient way to handle and dispose of biosolids. It is anticipated that the master plan will lead to three major projects going forward: (1) Heat and Power Improvements; (2) Biosolids Processing; and (3) Miscellaneous Energy Projects.

CIP ID# **A11** Septage Receiving Modifications

**Start Date**
2024

**Completion Date**
2027

**Project Type**
Plant Improvements – Septage Receiving

**Location**
Nine Springs Wastewater Treatment Plant

**Description**
This project will correct problems encountered with operation of the existing septage receiving facility. Work will include reconfiguration of the existing facility to allow improved traffic flow, better screening equipment upstream of the Headworks Facility and implementation of more security and tracking measures to reduce the potential for unauthorized discharges. This project was included in the 2016 Liquid Processing Facilities Plan. It is anticipated that project costs will be funded through the Clean Water Fund.

**Background**
The septage receiving facility was constructed as part of the Tenth Addition to the treatment plant and has experienced a number of operational difficulties since it was placed into operation. Trucks discharging at the facility have to back up to empty their contents, resulting in congestion during periods of heavy traffic and icy and unsafe conditions in winter. Further, sand and grit accumulate in the discharge trough, which requires manual cleaning by District staff on a frequent basis. Improvements will allow for one-way traffic for haulers and an improved screening system to keep unwanted material out of the screening channel. A space needs study for the treatment plant is planned for 2022-2023, which will help inform the preferred location of the future facility.

# Capital Project Infrastructure Placement Plan

CONCEPT PRESENTATION
April 10, 2023

Madison Metropolitan
Sewerage District

# Agenda

**1:00 -1:30p** **Workshop 02 Recap and Discussion**

1. Introduction
2. Project Goals
3. Recap Workshop 02
    a. Updated program/projects

**1:30 – 2:30** **Infrastructure Placement Recommendations**

1. Biosolids Improvements
2. Septage Receiving Improvements
3. Campus Security
4. Workplace Improvements
5. Regional Stormwater System
6. Solids Digestion Expansion

**2:30 – 3:00** **Discussion and Wrap-up**


EXISTING BUILDINGS
PROPOSED BUILDINGS
EXISTING ROADWAY
PROPOSED ROADWAY
SOUTH TOWN DRIVE
RAYWOOD ROAD
CAPITAL CITY TRAIL
MAINTENANCE FACILITY BUILDING
MOORLAND ROAD

# Project Goals

1. Locate new infrastructure projects aligned with strategic priorities
2. Consider future infrastructure and maintenance needs
3. Allow for safe movement of staff and visitors

# Plan Considerations

- Safety and security
- Public access
- Growth in staff/ office space needs
- Modern office and IT needs

# The plan will…

- Consider general placement of program/strategic infrastructure priorities
- Provide planning level cost estimates

## The Plan won't…

- Design buildings, initiatives, or efforts identified in approved plans that require additional investigation
- Analyze alternatives identified in previous plans
- Analyze financial impact

# Success Criteria and Strategy…

## Strategic Performance Areas

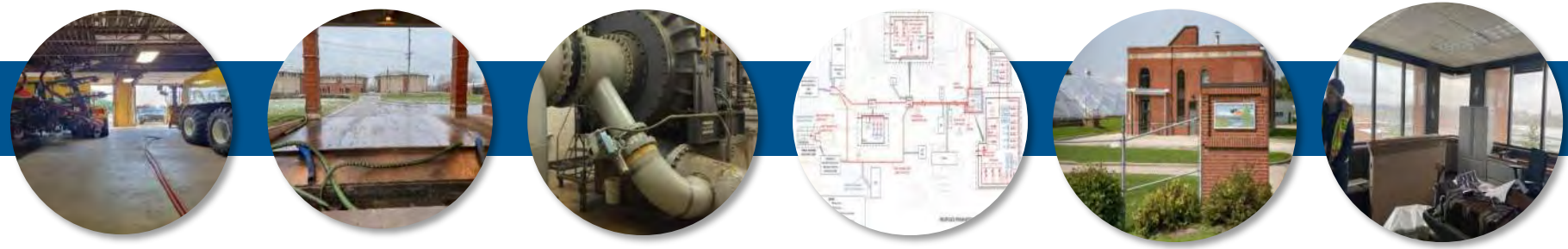

## What does Plan success look like?

- Helps prepare for the 2024 Capital Improvements Plan
- Is implementable, provides data-based information to guide decision-making
- Is relatable and easily presented

# Schedule


Organize/Review Background Info. Fall 2022
Project Introduction Workshop 01 Nov. 15-16, '22
Site Analysis/ Draft Alternatives
Alternative Analysis Workshop 02 Jan. 31, 2023
We are here
Alternatives Refinement February 2023
Final Alternative Review Workshop 03 April 10, 2023
Final Capital Project Infrastructure Placement Plan April 2023

# Site Context



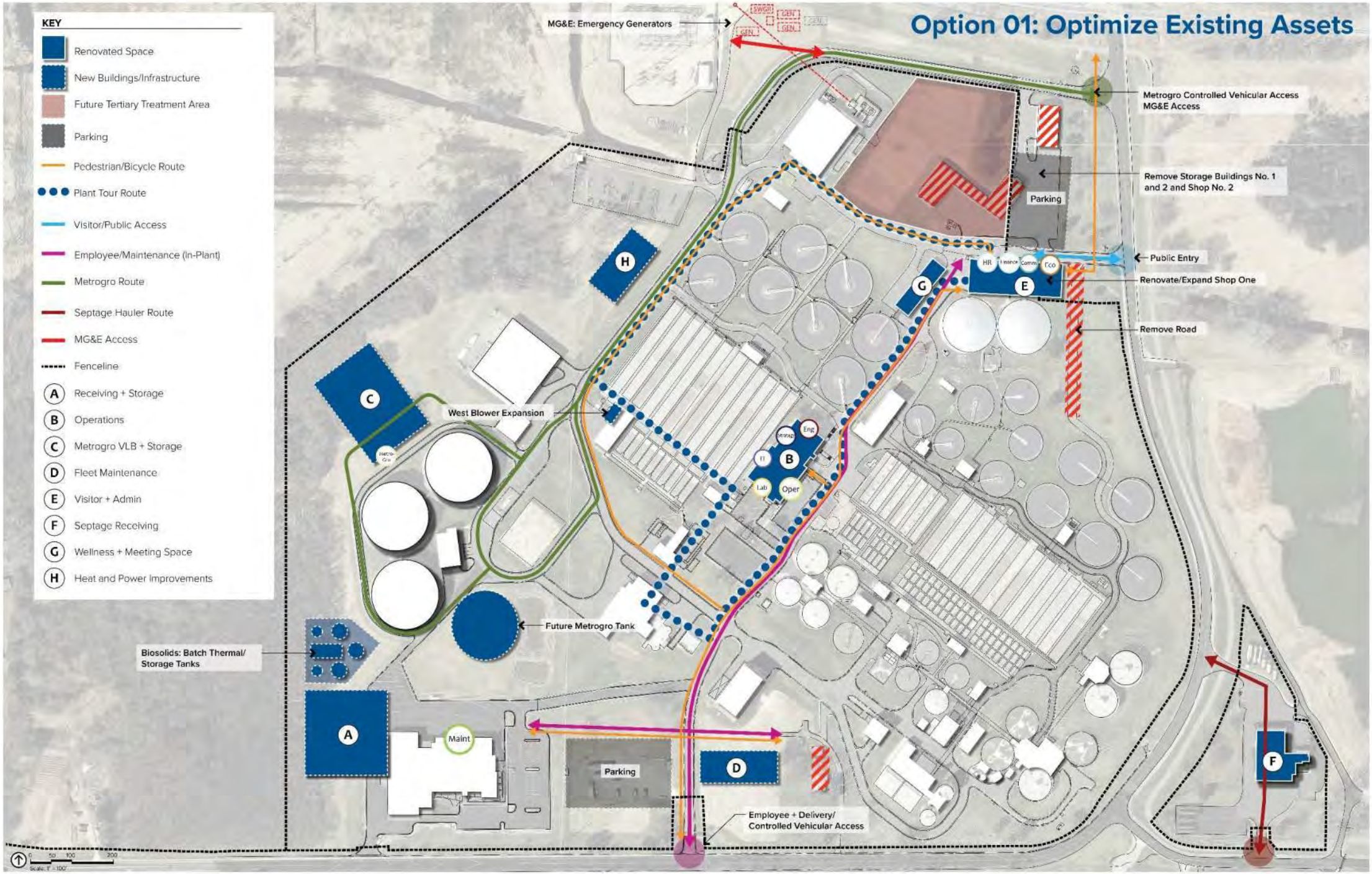
# Program

## CIP Projects

- Electrical Service Upgrade and Backup Generators
- Biosolids Improvements
- Septage Receiving Improvements
- Heat and Power Improvements
- Liquid Processing Phase 2

## New Projects

- Campus Security/Safety Improvements
- General Workplace Improvements
- Plant Expansion/Tertiary Treatment
- Regional Stormwater
- Solids Digestion Expansion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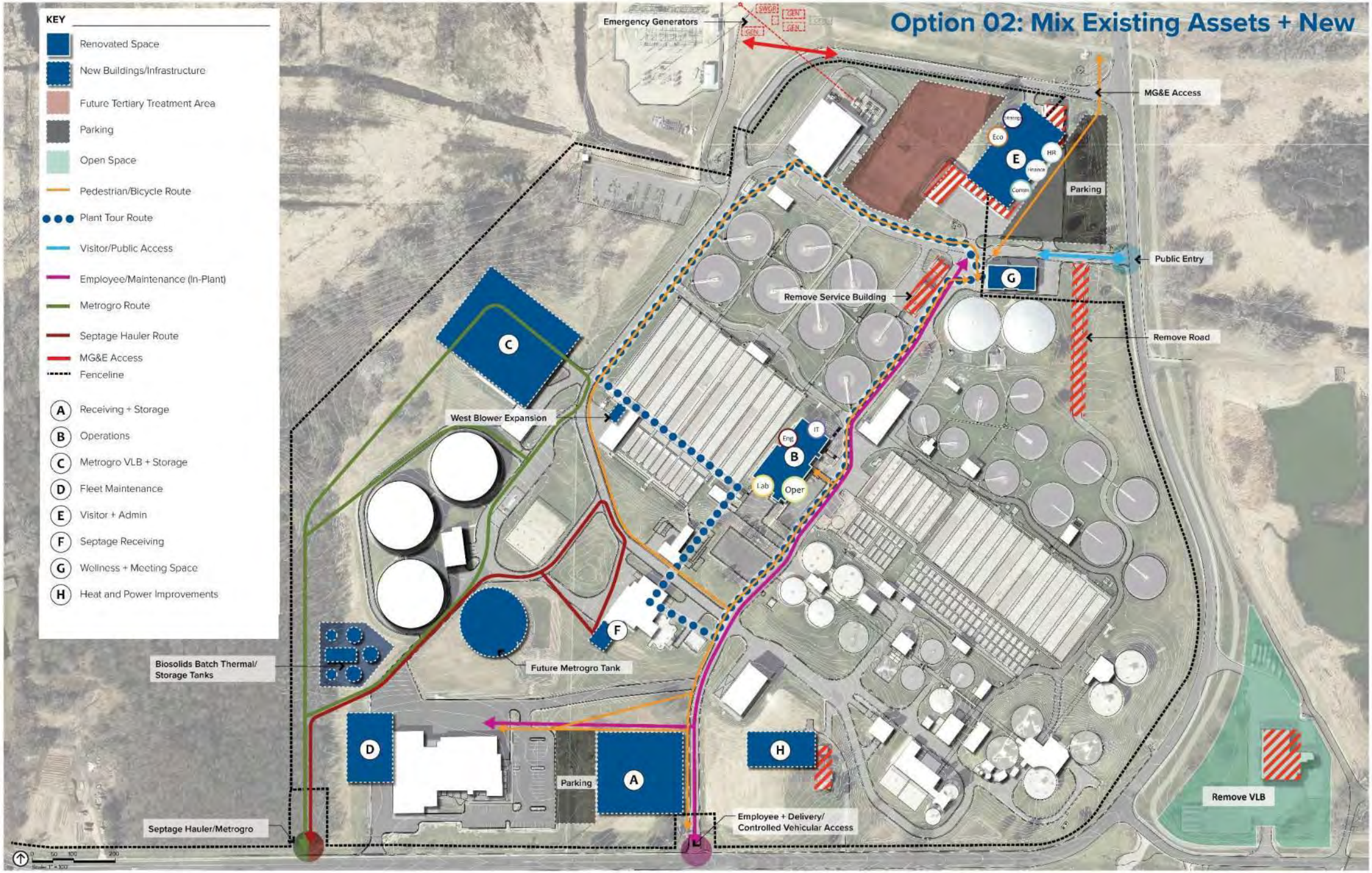
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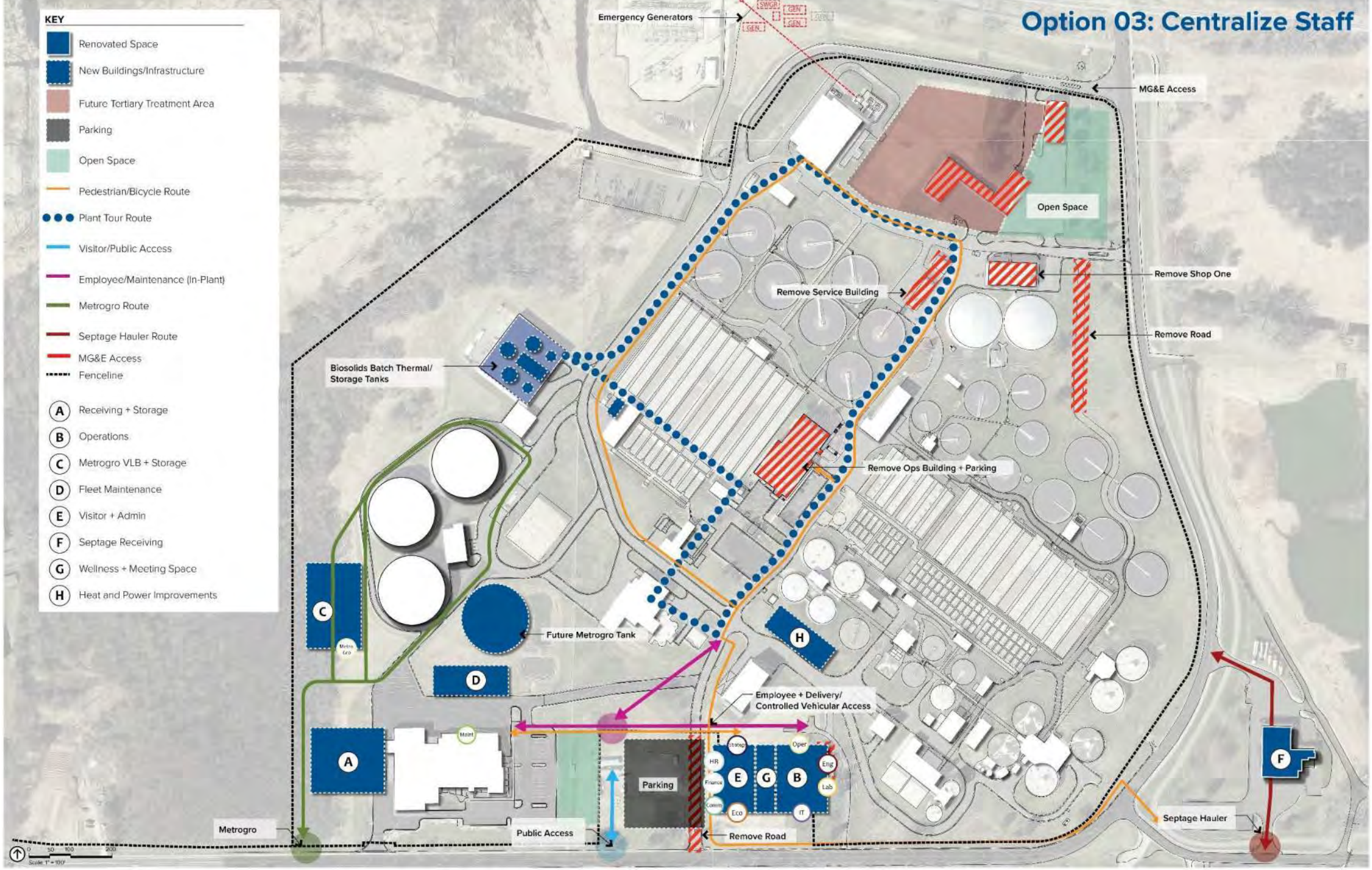
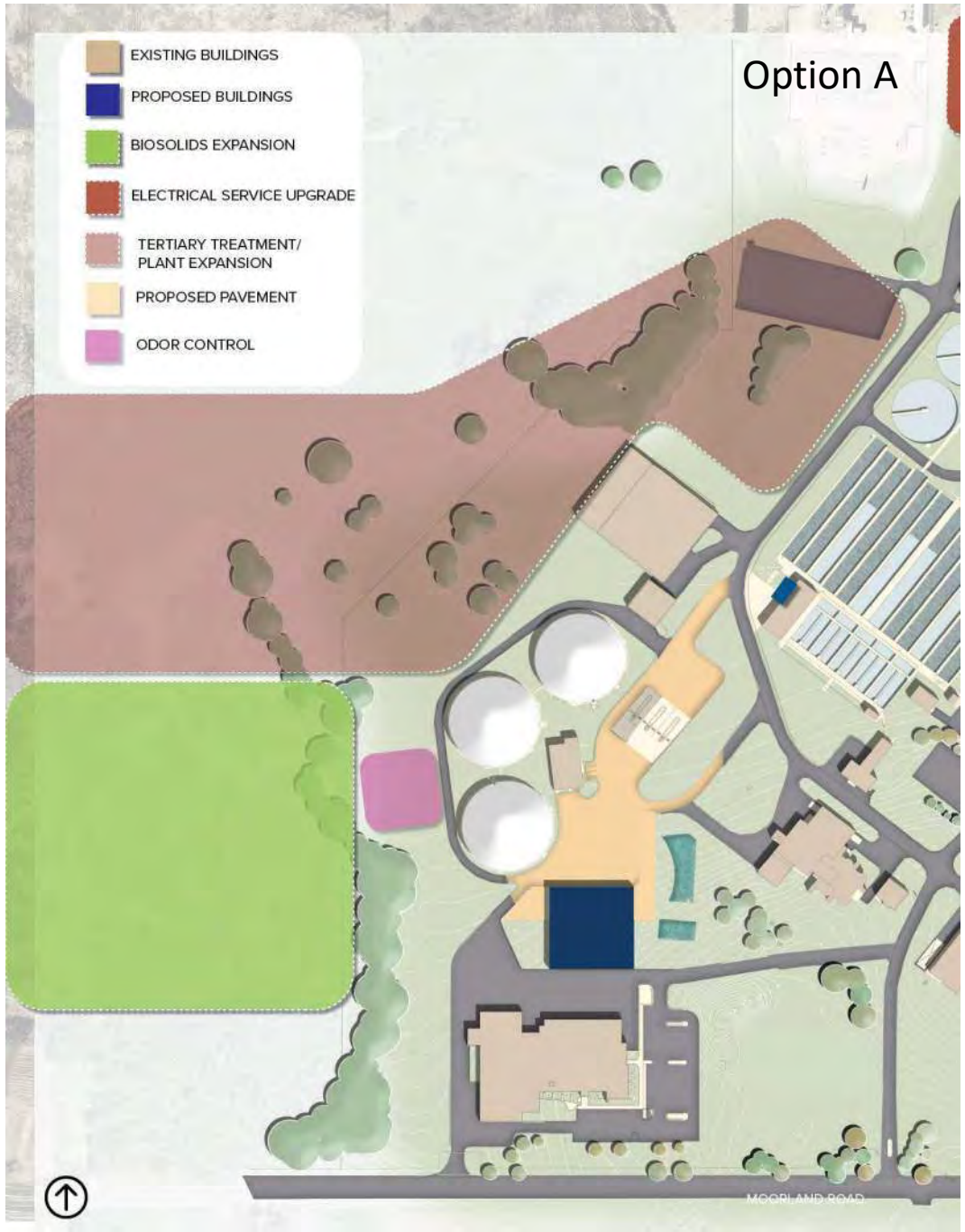


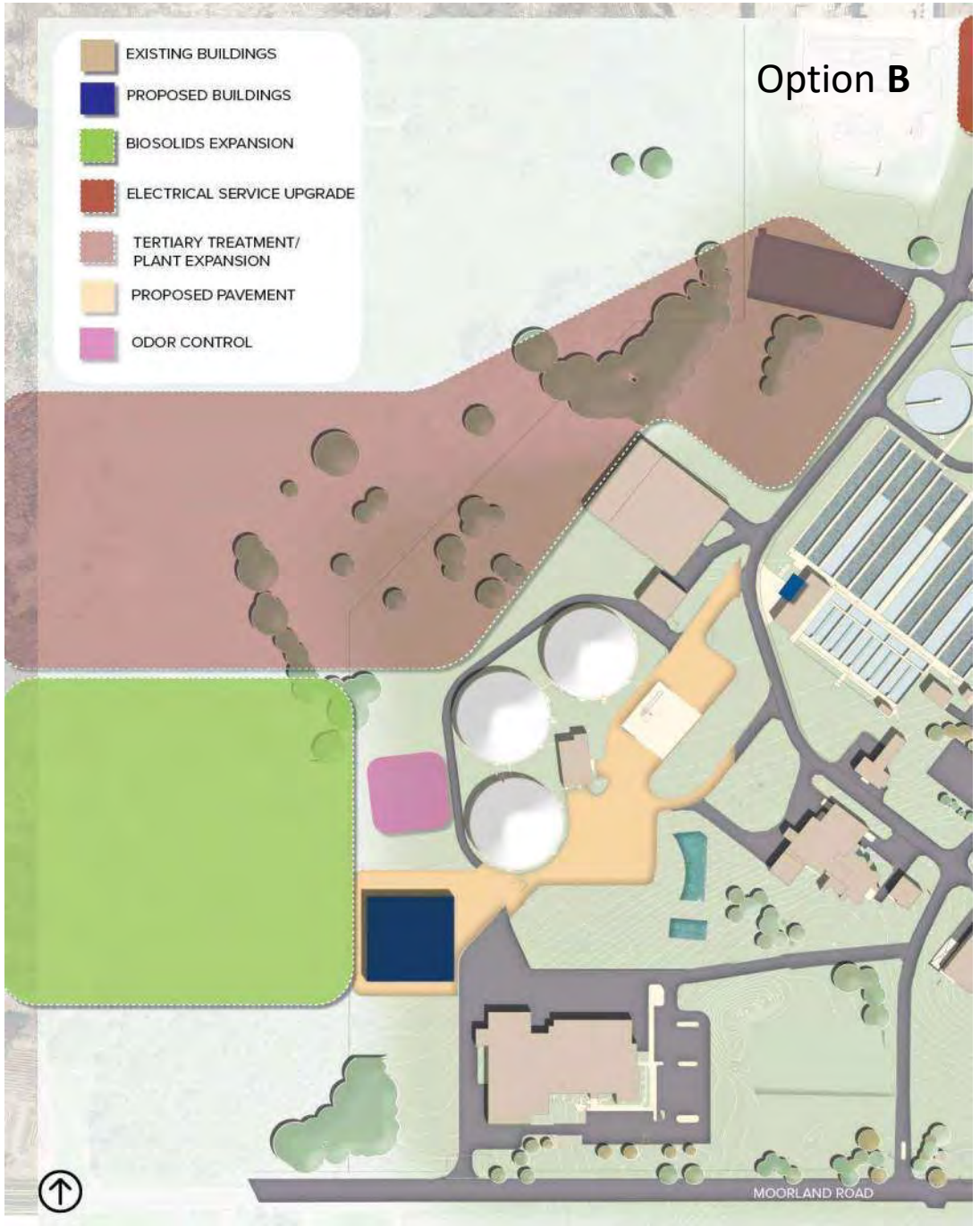
# Existing Conditions

# Future Expansion

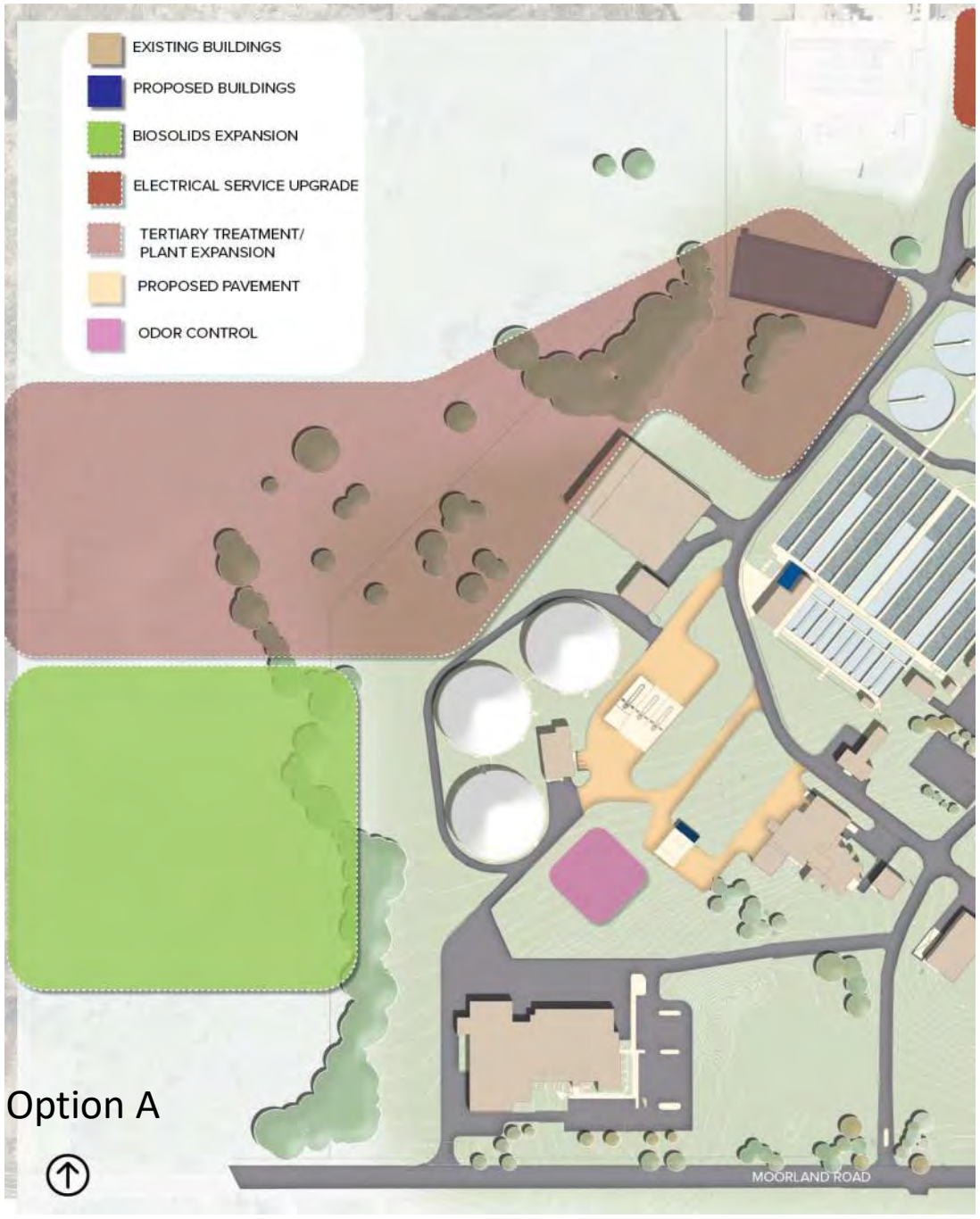
# Biosolids Improvements | Vehicle Loading Expansion

# Biosolids Improvements | Metrogro Storage & Maintenance

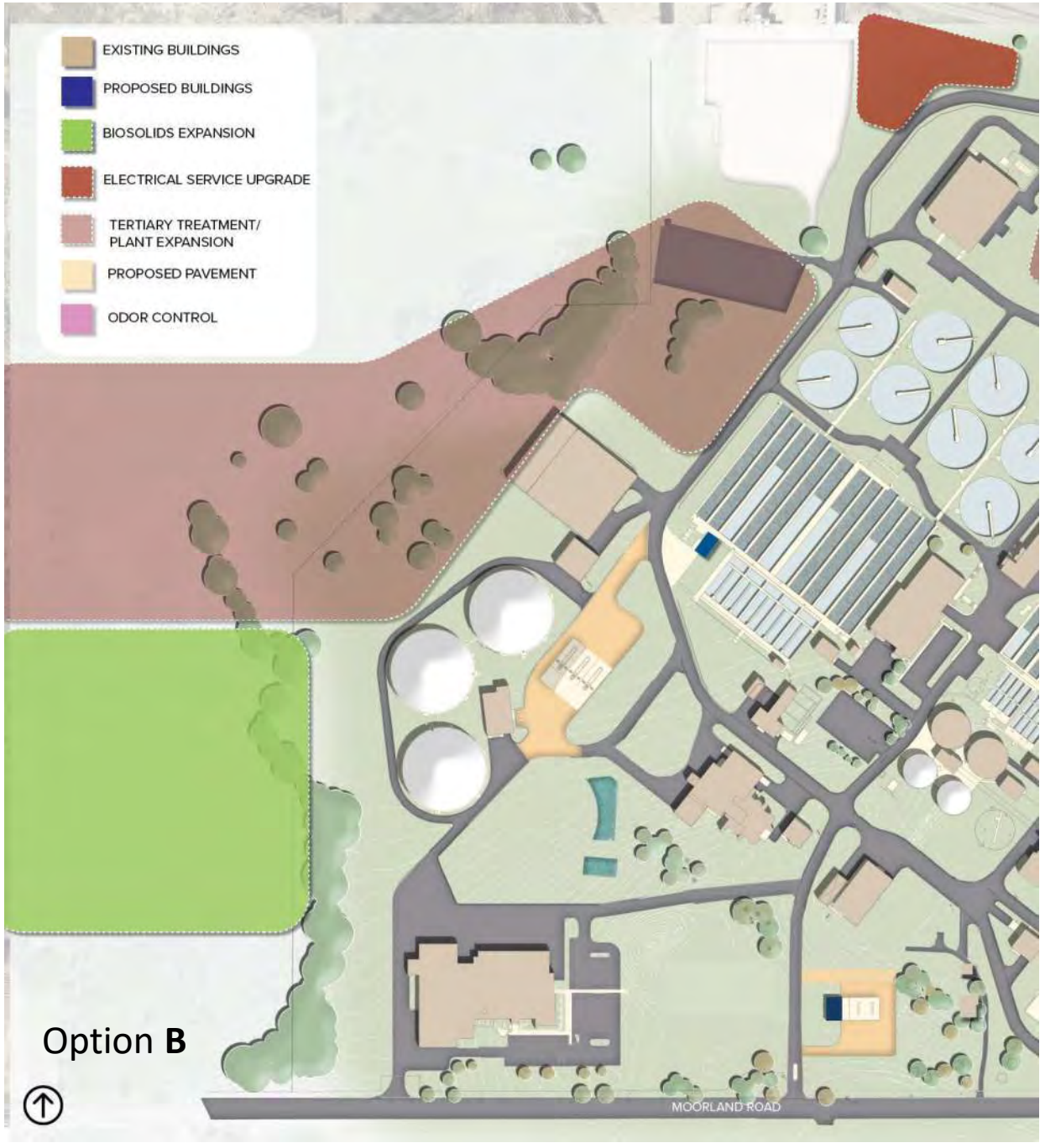


# Septage Receiving Improvements



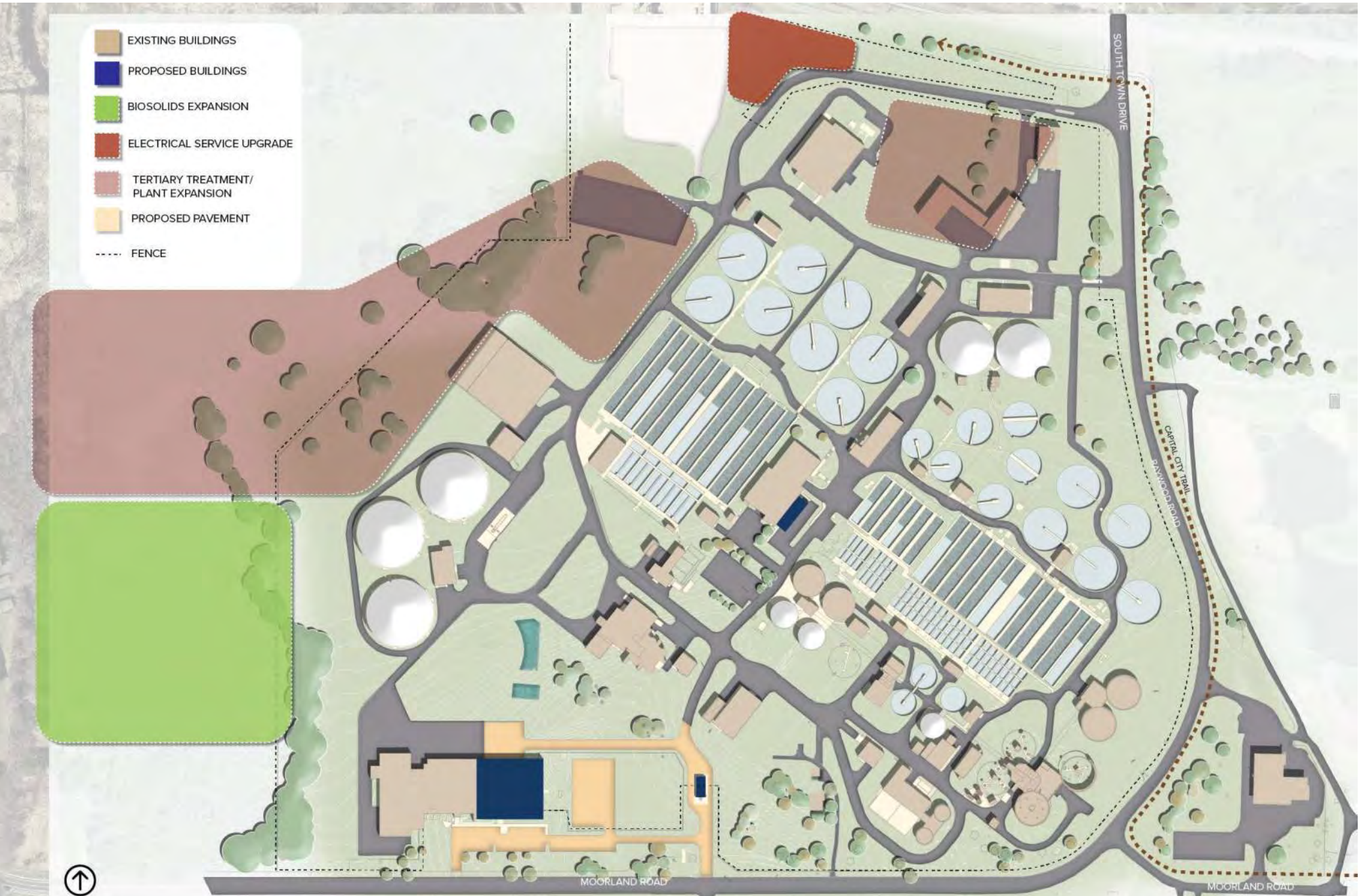

Option A




Option **B**

# Heat and Power Improvements

# Security Improvements - Administration



# Security Improvements – Administration & Circulation

# Workplace Improvements | Receiving Warehouse & Storage

# Plant-wide Stormwater Facility

# Solids Digestion Expansion

# Discussion and Wrap-Up

# Full Build | Land Use

# Full Build | Example


Thank you!
TKDA