



CITY OF HENDERSONVILLE WATER SEWER ADVISORY COUNCIL

Operations Center - Assembly Room | 305 Williams St. | Hendersonville NC 28792
Monday, October 25, 2021 – 6:00 PM

AGENDA

1. **CALL TO ORDER**
2. **PUBLIC COMMENT**
3. **APPROVAL OF AGENDA**
4. **APPROVAL OF MINUTES**

A. July 26, 2021 Minutes

5. **NEW BUSINESS**

A. Adoption of Annual Schedule of Meetings 2022

B. Presentation of Wastewater Treatment Plant Master Plan - *McKim and Creed Consulting Engineers*

6. **STAKEHOLDER COMMENTS**
7. **ADJOURNMENT**

The City of Hendersonville is committed to providing accessible facilities, programs and services for all people in compliance with the Americans with Disabilities Act (ADA). Should you need assistance or an accommodation for this meeting please contact the City Clerk no later than 24 hours prior to the meeting at 697-3005.



CITY OF HENDERSONVILLE WATER SEWER ADVISORY COUNCIL

Operations Center - Assembly Room | 305 Williams St. | Hendersonville NC 28792
Monday, July 26, 2021 – 6:00 PM

MINUTES

Present: County Commissioner & Chairman Daniel Andreotta, City of Hendersonville Council Member & Vice Chair Jeff Miller, Village of Flat Rock Council Member David Dethero, Henderson County Water/Sewer Customer Representative Andrew Riddle, Town of Laurel Park Council Member Paul Hansen

Participating Electronically: City of Hendersonville Water/Sewer Customer Representative Chuck McGrady

Absent: Town of Fletcher Council Member Sheila Franklin, Town of Mills River Council Member Roger Snyder, Chamber of Commerce Business Representative Wade Anderson, City of Saluda Council Member Stan Walker

Vacant Seat: Partnership for Economic Development Representative

Staff Present: City Manager John F. Connet, Assistant City Manager Brian Pahle, City Clerk Angela Reece, Communications Manager Allison Justus, Budget Manager Adam Murr, Utilities Director Lee Smit, Utilities Engineer Adam Steurer, Assistant to the Utilities Director Drew Finley, and others.

Others Present: Mills River Town Manager Daniel Cobb, Laurel Park Town Manager Chris Todd, City of Saluda City Manager Steve Orr, County Engineer Marcus Jones, Larry Rogers PEP

1. CALL TO ORDER

Chairman Daniel Andreotta called the meeting to order at 6:28 p.m. and welcomed those in attendance. A quorum was established with five members in physical attendance and one member in attendance electronically.

2. APPROVAL OF AGENDA

Chuck McGrady moved to approve the agenda as presented. A unanimous vote of the Council Members followed. Motion carried.

3. APPROVAL OF MINUTES

A. April 26, 2021, and May 24, 2021- Minutes – Angela Reece, City Clerk

Vice Chairman Jeff Miller moved to approve the minutes of April 26, 2021, and May 24, 2021, as presented. A unanimous vote of the Council Members followed. Motion carried.

4. PUBLIC COMMENT

There were no comments.

5. NEW BUSINESS

A. Presentation of Updated Charter & Rules of Procedure – John Connet, City Manager

At the request of this Council, City Manager John Connet presented a draft charter amendment and rules of procedure which allows participating governments to appoint alternate membership to assist in establishing quorum. Manager Connet advised the charter has been formatted for consistency with other city advisory board charters and includes rules of procedure as outlined in Roberts Rules Newly Revised.

Council Member Chuck McGrady moved to accept and recommend for adoption by the Hendersonville City Council the proposed Charter and Rules of Procedure for the Water & Sewer Advisory Council as presented. A unanimous vote of the Council Members followed. Motion carried.

B. Presentation of Proposed Water and Sewer Strategic Plan –Assistant to Utilities Director Drew Finley, Utilities Director Lee Smith

Mr. Drew Finley Presented an overview of the proposed Water and Sewer Strategic Plan to the Council and discussed areas of septic transition as depicted below.

CITY OF HENDERSONVILLE | Sanitary Sewer Asset Inventory and Assessment

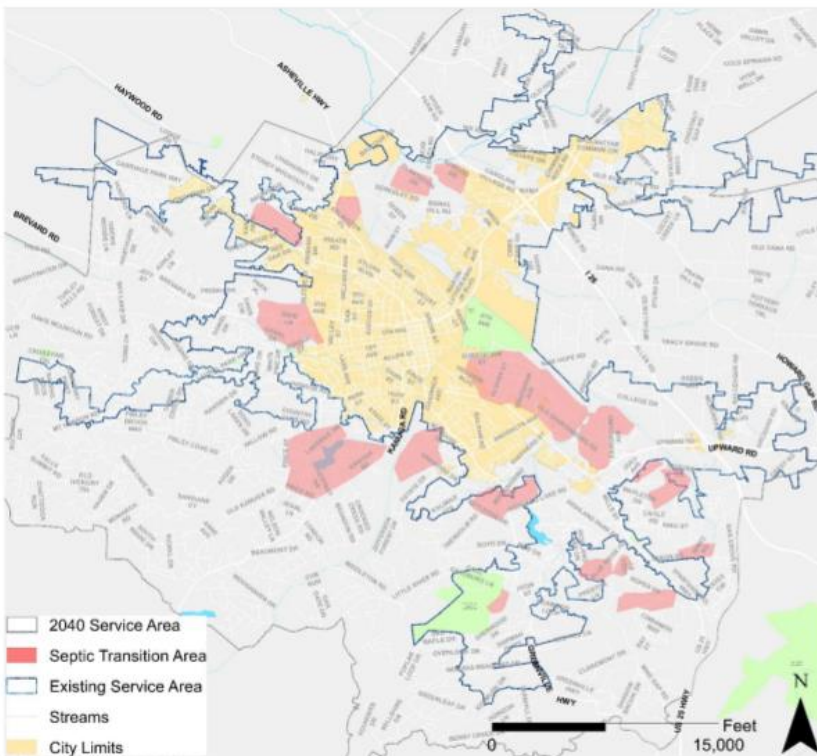


Figure 4-7 Areas of Septic Transition

City Manager John Connet discussed revenue and rate priorities stating this helps to cover the cost of existing debt service payments and will allow developers and new growth to buy into the system. Manager Connet stated this is an opportunity to repair aging and failing infrastructure to improve public health and water quality.

C. Capital Projects Update - Various Staff

Adam Steurer, Utilities Engineer presented water and sewer updates to the Council. City Manager John Connet asked Council Members to share the power point with their governing boards. The public may learn more by visiting the Water & Sewer CIP Story Map at <https://hendersonville.maps.arcgis.com/apps/MapJournal/index.html?appid=4b557a3381624750bf66e320aa241693> Below are excerpts from the presentation:

Sanitary Sewer Inflow and Infiltration Reduction Projects:

- WWTP Master Plan – Assessment of existing facility complete, plan will be complete fall 2021
- Clear Creek Interceptor Replacement – Under construction, completion mid 2022
- Mud Creek Interceptor Replacement – SRF funding awarded, under design, construction early 2023

Projects Under Construction:

- Etowah Area Water Improvements - Estimated completion fall 2021, 90% complete, approximately \$8M
- Northside Water Improvements - Estimated completion fall 2021, 70% complete, approximately \$5.4M
- NCDOT I-26 Project (Water and Sewer Improvements) - estimated completion fall 2021, 70% complete (road project completion ~2024), approximately \$4.0M
- Hebron Water Pressure Zone Improvements – construction nearly complete, approximately \$400,000
- French Broad River Intake - Contract award fall 2021 with construction complete early 2024, approximately \$16M, SRF funding
- NCDOT Project U-5887 Highland Lake Road - Bid May 2021, water construction fall 2021, approximately \$500,000
- Ewart Hill Reservoir Rehabilitation - Bidding fall 2021 with construction complete late 2021, approximately \$500,000
- Ashe/4th Water and Sewer Improvements - Bidding fall 2021, approximately \$2.6M, SRF funding
- Church Street Water and Sewer Improvements - Bidding fall 2021, approximately \$5M
- 7th Avenue Streetscape Water Improvements – Bidding summer 2021, approximately \$300,000

Brent Detwiler, City Engineer provided an update on Halfway Tree stating they have been delayed in completing the sanitary sewer installation and have been waiting for a specialty groundwater dewatering contractor to come in and lower the groundwater elevation so they can continue construction.

6. OTHER BUSINESS- NONE

7. ADJOURNMENT

The meeting was adjourned at 6:49 p.m. upon assent of Council Members present.

ATTEST:

Daniel Andreotta, County Commissioner & Chairman

Angela L. Reece, City Clerk

NOTICE

City of Hendersonville Water/Sewer Advisory Council | 160 Sixth Avenue East Hendersonville, NC 28792

CITY OF HENDERSONVILLE

Water & Sewer Advisory Council

ANNUAL SCHEDULE OF REGULAR MEETINGS 2022

The following Regular Meetings of the City of Hendersonville **Water & Sewer Advisory Council** are held **Quarterly on the fourth Monday of July, October, January, and April at 6:00 p.m.** in the Assembly Room of the City Operations Building located at 305 Williams St. Hendersonville NC. The regular meetings will be conducted in person.

The following Water & Sewer Advisory Council meetings have been scheduled for 2022.

January 24, 2022

April 25, 2022

July 25, 2022

October 24, 2022

Meetings are open to the public.

Chairman

The Water and Sewer Advisory Council is a requirement of the 2002 Mud Creek Sewer District Purchase and Interlocal Cooperation and Settlement Agreement with Henderson County.

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Posted 10/26/2021

<https://www.hendersonvillenc.gov>





CITY OF HENDERSONVILLE

Wastewater Treatment Facility Master Plan

October 2021

Today's Outline

- Purpose of the WWTF Master Plan
- WWTF by the Numbers
- Existing and Future Flows/Loads
- Summary of Major Facility Needs
- Implementation Timeline



WHY IS THE MASTER PLAN NEEDED?

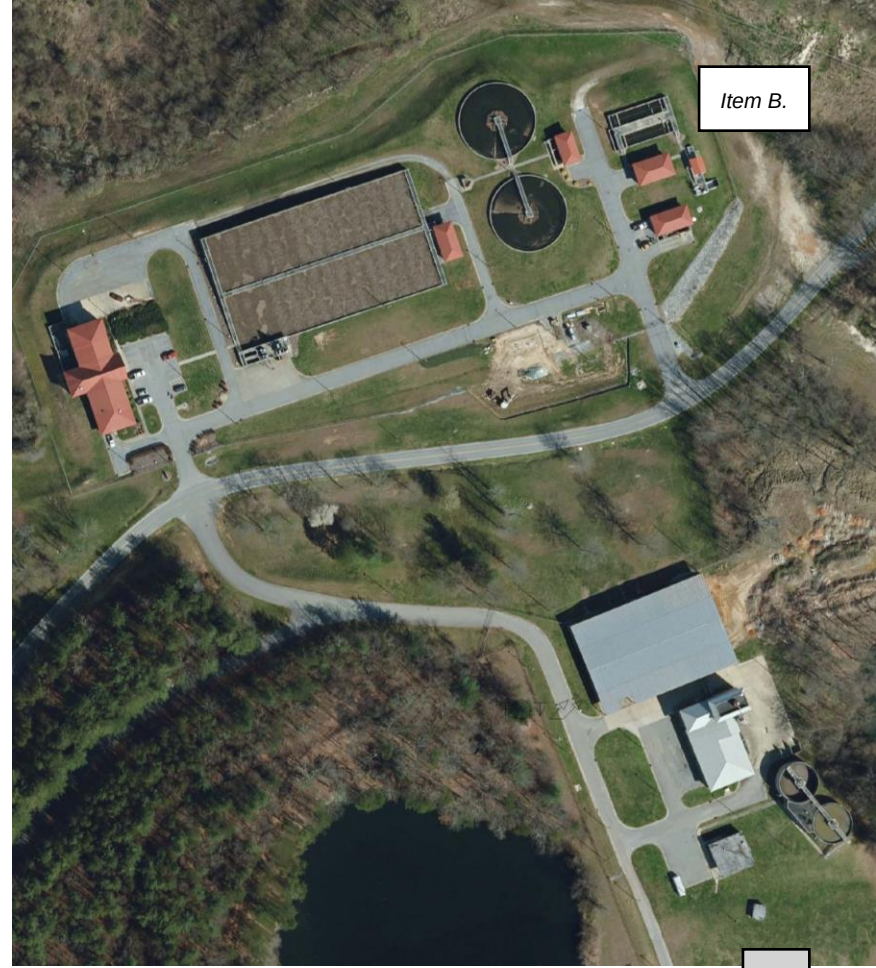
1. Wastewater treatment needs are dynamic
 - No full-scale evaluations have been completed since original 2001 construction
2. Aging infrastructure
 - Most equipment reaching end of useful life
3. Capacity Limits
 - 90% of permitted capacity projected to be reached by 2025
 - Hydraulic capacity of the WWTF impacts frequency and volume of SSOs
4. Satisfies regulatory requirements
 - Satisfies engineering evaluation requirements of 80/90% rule for future expansion (15A NCAC 02T .0118)

MASTER PLAN APPROACH

1. Review previous engineering reports and flow projections
2. Assess condition of existing facilities
3. Evaluate capacity of existing treatment processes and major equipment
4. Evaluate alternatives for replacement/rehabilitation, improvement, and expansion needs
5. Provide a capital improvement plan to ensure wastewater treatment needs are met over the next 20 years

WWTF – BY THE NUMBERS

- Construction completed in 2001
- 4.8 million gallons per day (MGD) permitted capacity - monthly average
- 12 MGD hydraulic capacity
- 3.0 MGD average influent flow
- Average biological oxygen demand (BOD) and total suspended solids (TSS) removal >97%
- NPDES Permit includes effluent limitations for future 6.0 MGD capacity



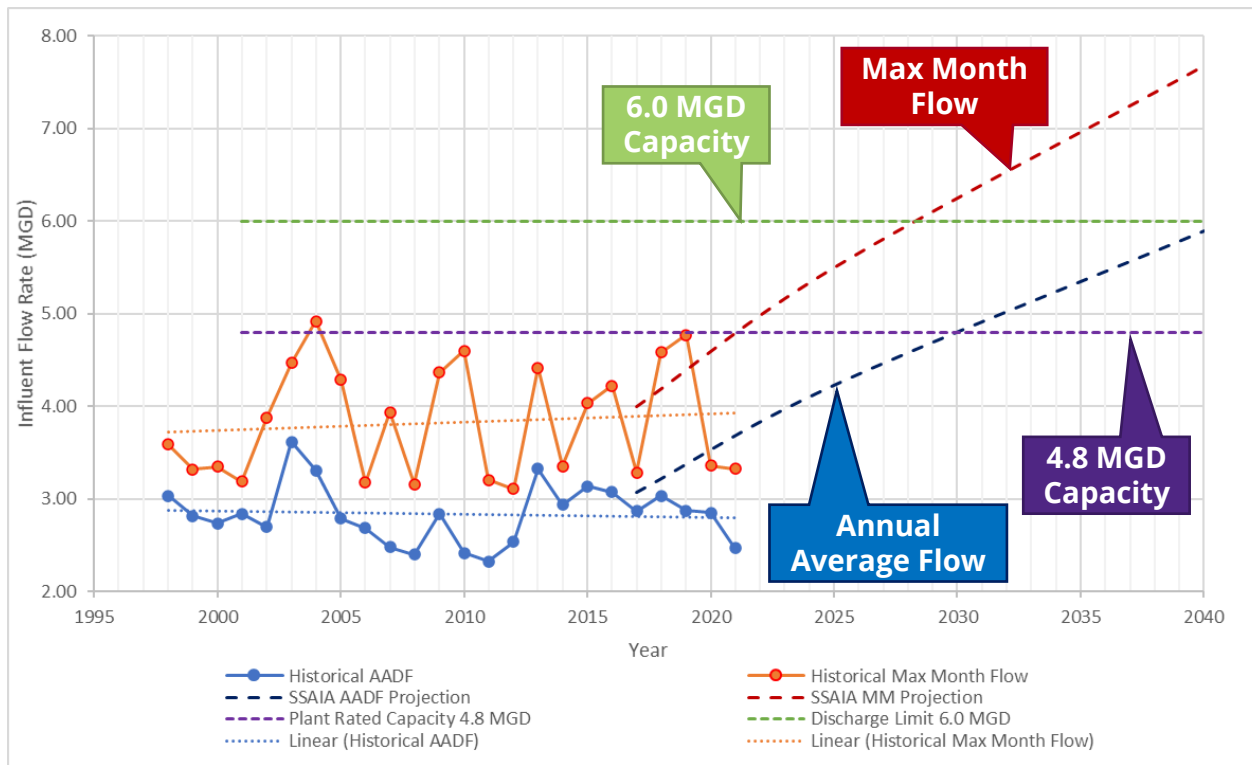
NPDES PERMIT REQUIREMENTS

Item B.

- No limits for total nitrogen (TN) or total phosphorus (TP), nutrient removal not currently required
- Future effluent limits for 6.0 MGD expansion already established
- Stricter effluent limits to include TN or TP may be possible in the future

Effluent Characteristics	Monthly Average	Weekly Average
Flow	4.8 MGD	
<i>Flow (future)</i>	<i>6.0 MGD</i>	
BOD ₅ (summer)	10 mg/L	15 mg/L
BOD ₅ (winter)	20 mg/L	30 mg/L
TSS	30 mg/L	45 mg/L
NH ₃ -N (summer)	2.0 mg/L	6.0 mg/L
NH ₃ -N (winter)	4.0 mg/L	12.0 mg/L

EXISTING AND FUTURE FLOWS



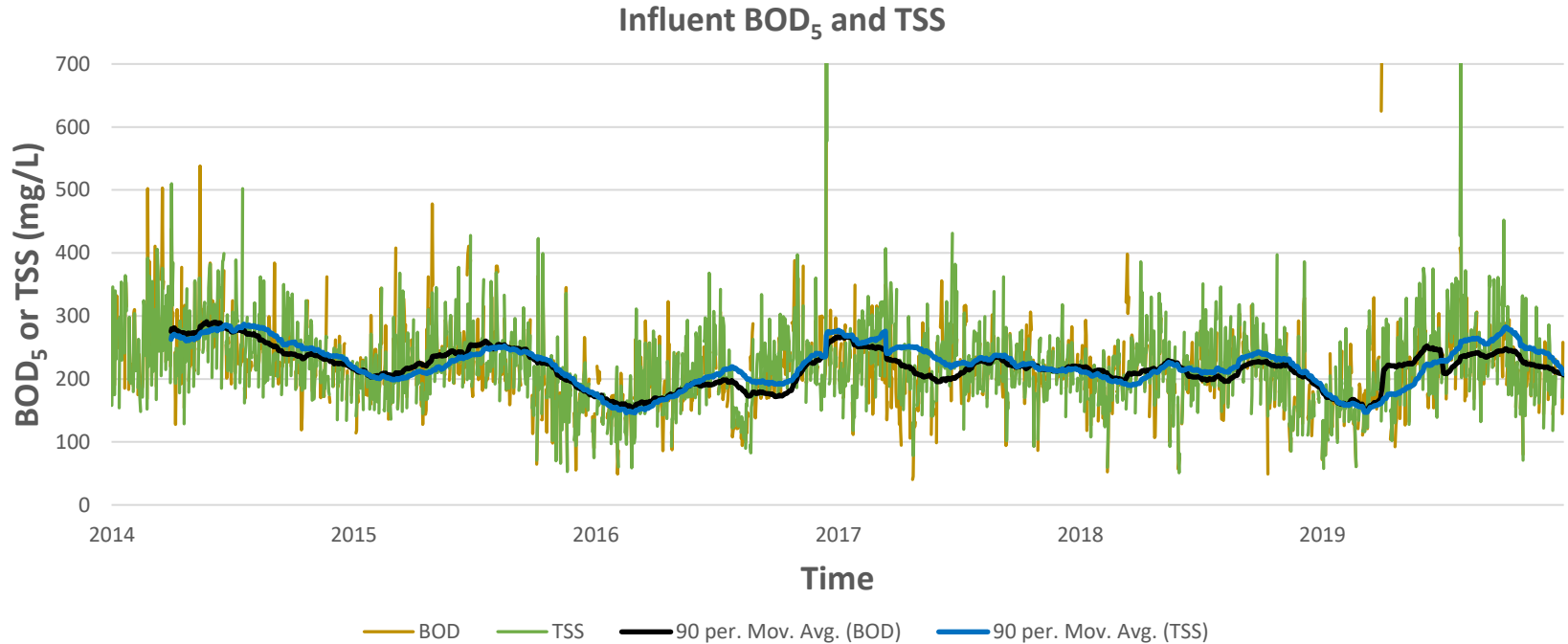
BREAKDOWN OF FLOW PROJECTIONS

- Historical flows have been very consistent
- Future flow projections can be highly variable depending on:
 - Population/industrial growth
 - Service area expansion
 - Private system conversions
- Monitor influent flows consistently and update projections periodically
- Proactive inflow/infiltration (I/I) reduction program can help reduce future flows and wet weather peaks
- Timing of growth impacts timing of WWTF expansion needs (80/90% rule)

Permitted WWTF Capacity (MGD)	AADF at 90% of Permitted Capacity	Year WWTF Expansion Required
4.8 (current capacity)	4.32	2025
6.0	5.40	2035
7.8	7.02	2050*

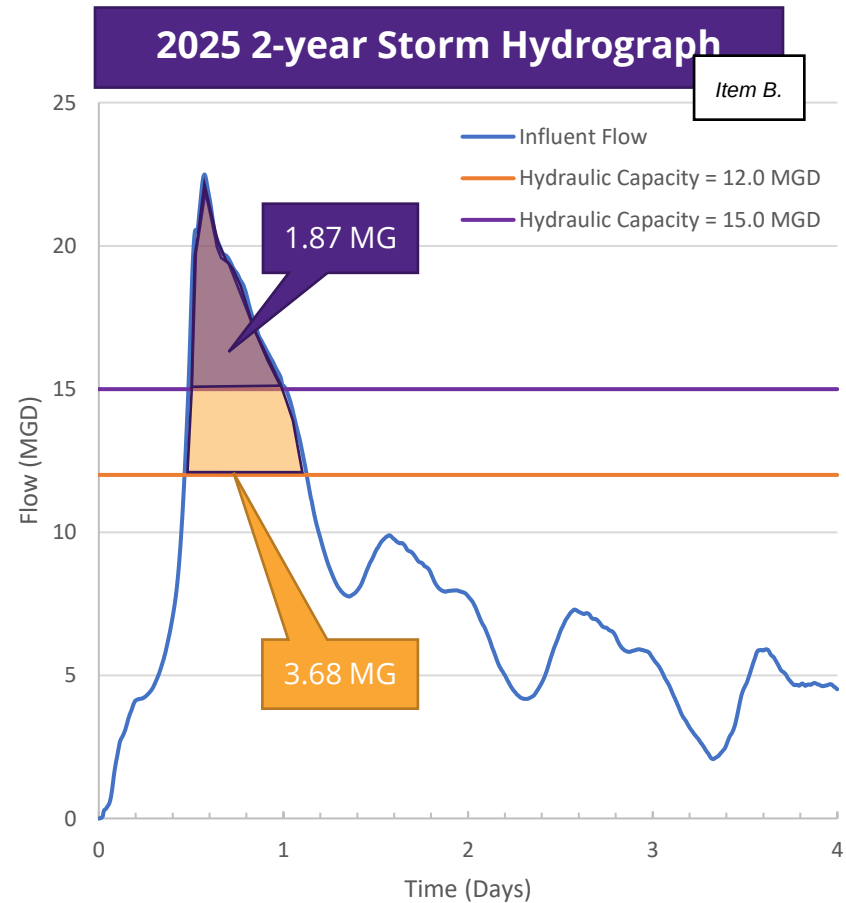
INFLUENT LOADING

Item B.



FACILITY HYDRAULIC ANALYSIS

- Current and future peak hour flows exceed WWTF hydraulic capacity
- Flow equalization needed to store wet weather peaks
- Design 6.0 MGD expansion for 15 MGD hydraulic capacity
 - I/I reduction program can reduce peaks and EQ volume needed
- Failure to provide flow EQ or expand WWTF hydraulic capacity will lead to more sanitary sewer overflows (SSOs) or NPDES permit non-compliance
 - *Not the only solution to SSOs*





SUMMARY OF MAJOR FACILITY NEEDS

DEVELOPMENT OF MASTER PLAN RECOMMENDATIONS

Item B.

IDENTIFY NEEDS

- Condition assessments
- Capacity evaluations
- Previous studies



DEVELOP ALTERNATIVES

- Baseline option
- Feasible technologies
- City's preferences



COMPARE ALTERNATIVES

- Cost (Capex/Opex)
- Constructability
- Effluent quality
- Maintenance
- Energy efficiency
- Env. impacts



PRIORITIZE NEEDS

- Remaining life
- Regulatory compliance
- Capacity
- Reliability / operational flexibility



OVERALL GOALS:

1. Ensure that maintaining and expanding the WWTF is the most cost-effective method to reliably meet current and future treatment needs.
2. Optimize investments needed to ensure the WWTF continues to reliably meet regulatory limits and accommodate future growth

IMMEDIATE IMPROVEMENTS

Item B.

1. Ultraviolet Disinfection System Replacement
2. Aeration Basin Repairs & Rehabilitation

UV DISINFECTION REPLACEMENT

- Existing equipment unreliable and undersized for future flows
- Past lightning damage
- Construct a new parallel channel with equipment sized for 15 MGD
- New equipment more energy efficient with substantial energy savings
- Maintain the existing equipment as emergency back-up
- Design is underway

**Estimated Total Project Cost =
\$2,800,000**

Item B.



AERATION BASIN REPAIRS & REHABILITATION

- North wall of Aeration Basin No. 2 bowing outward and showing signs of stress fractures
- Perform engineering analysis and complete recommended repairs immediately
- Repair other areas of concrete cracking, spalling, and delamination

**Estimated Total Project Cost =
\$2,000,000**



NEAR TERM IMPROVEMENTS AND 6.0 MGD EXPANSION

Item B.

1. Headworks Improvements & Flow Equalization
2. Biosolids Treatment Improvements
3. Tertiary Filter No. 2 Replacement
4. Blower Building Improvements

HEADWORKS IMPROVEMENTS & FLOW EQUALIZATION

- Influent pump station, screening, and grit removal undersized for current and future peak wet weather flows
- Flow equalization needed to prevent capacity related SSOs and reduce peak flows through the WWTP
- Relocate screening to protect influent pumps
- Replace grit removal to better protect equipment and improve efficiency

Year	Permitted WWTF Capacity (MGD)	WWTF Hydraulic Capacity (MGD) (PF = 2.5)	2-Year Storm Peak Flow – Non-equalized (MGD)
Base (2017)*	4.8 (current capacity)	12.0	17.4
2025	6.0	15.0	22.5
2040	7.8	19.5	28.3

HEADWORKS IMPROVEMENTS & FLOW EQUALIZATION

Many combinations of alternatives were evaluated...

1. Upsize existing influent pumps
2. Expand existing influent pump station
3. Construct new influent pump station

1. Expand existing screening equipment
2. Relocate screening ahead of existing influent pump station
3. Relocate screening ahead of new influent pump station

1. Expand existing grit removal equipment
2. Replace existing grit removal with stacked tray vortex equipment
3. Replace existing grit removal with mechanically-induced vortex equipment

1. Rectangular cast-in-place concrete EQ basin
2. Circular prestressed concrete EQ tank
3. Circular bolted steel EQ tank

1. Flow equalization at existing WWTF site
2. Flow equalization at old plant site

1. Inline flow equalization
2. Offline flow equalization

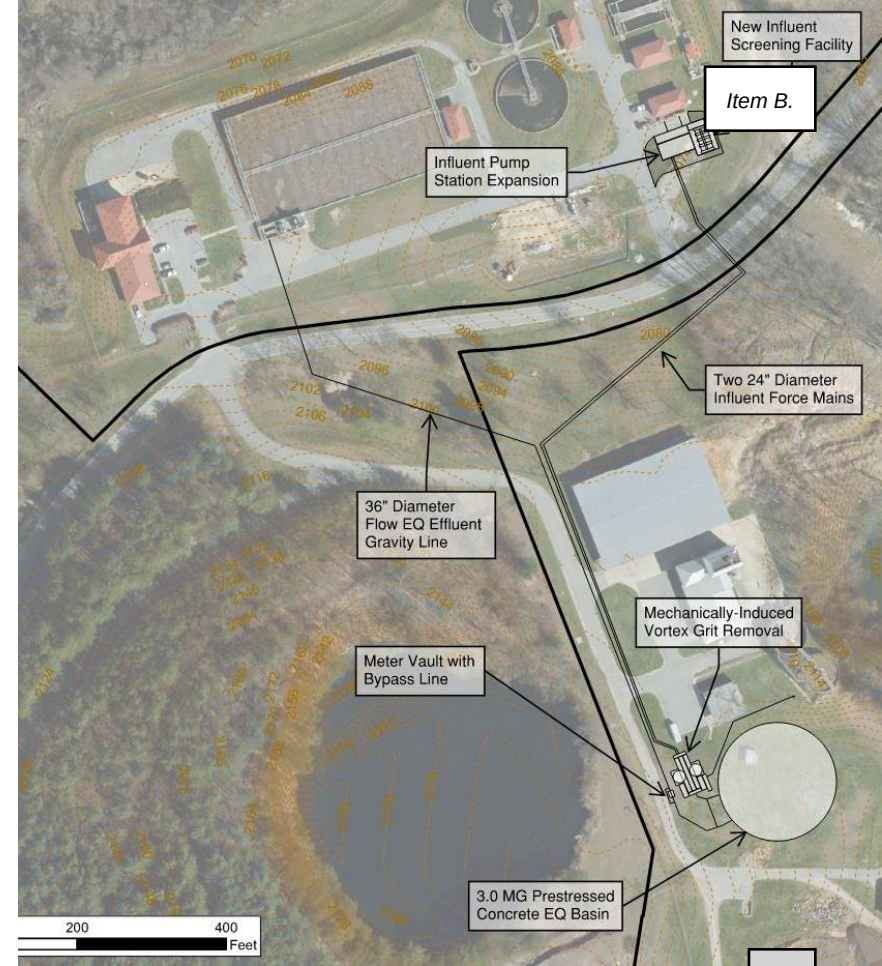
Factors considered:

1. Feasibility
2. Performance
3. Flexibility
4. Effluent Quality
5. Capital Costs
6. O&M Costs

HEADWORKS IMPROVEMENTS & FLOW EQUALIZATION RECOMMENDATION

- Construct 3.0 MG inline flow equalization basin at old plant site
- Inline EQ improves treatment performance reliability
- Screening relocation will extend life of influent pumps
- Better grit removal protects all downstream equipment and basin capacity

**Estimated Total Project Cost =
\$27,000,000**



BIOSOLIDS TREATMENT IMPROVEMENTS

Item B.

- Biosolids (sludge) landfill disposal cost recently increased suddenly
 - \$56/ton to \$96.50/ton
- Landfills can impose additional rate increases, or refuse disposal, without warning
- Construct biosolids thermal drying facility as previously recommended in Solids Management Plan
 - Produces Class A-EQ (exceptional quality) biosolids
 - ~80% reduction in biosolids mass to be disposed

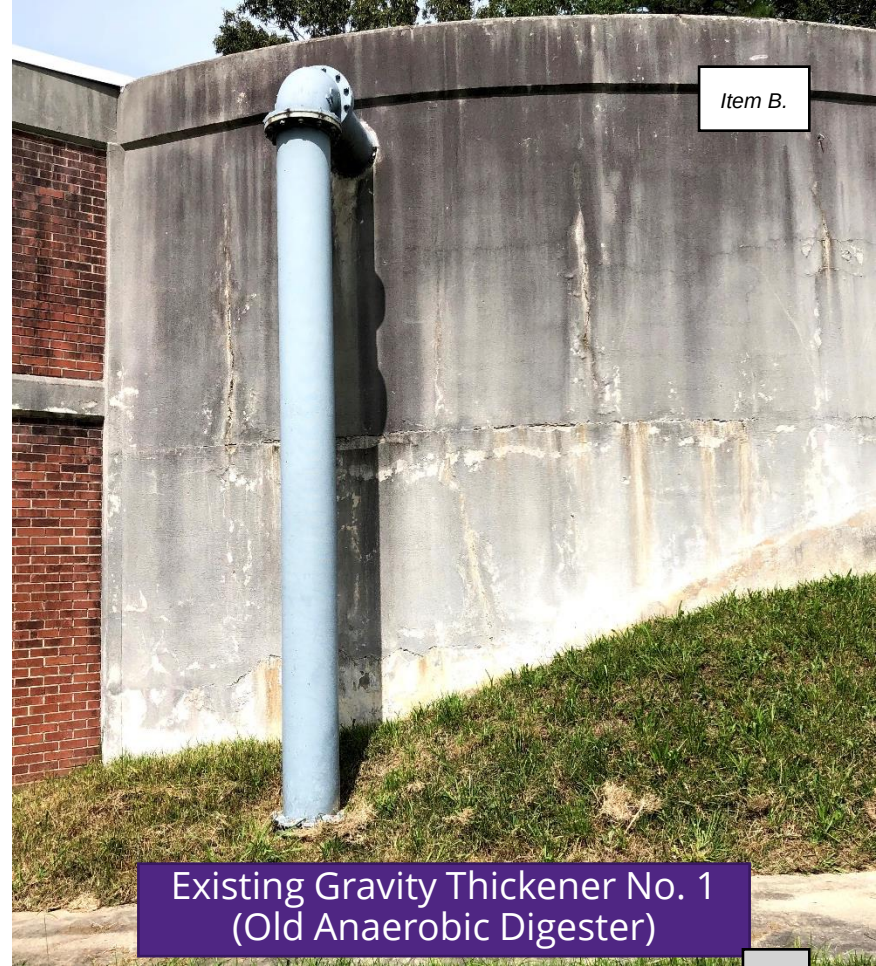


City of Lenoir Lower Creek WWTBiosolids Thermal Drying Facility

BIOSOLIDS TREATMENT IMPROVEMENTS

- Gravity Thickener No. 1 in need of structural repairs
- Aerated thickened sludge holding tanks needed after thickening
- Replace/rebuild existing dewatered sludge cake conveyor
- Complete at time of thermal drying facility construction

**Estimated Total Project Cost =
\$17,000,000**



Existing Gravity Thickener No. 1
(Old Anaerobic Digester)

TERTIARY FILTER NO. 2 REPLACEMENT

- Existing traveling bridge sand filter unreliable and used infrequently
- Replacement needed to provide redundancy for 6.0 MGD permitted capacity
- Replacement to match AquaDiamond Filter No. 1 completed in 2019

**Estimated Total Project Cost =
\$2,200,000**

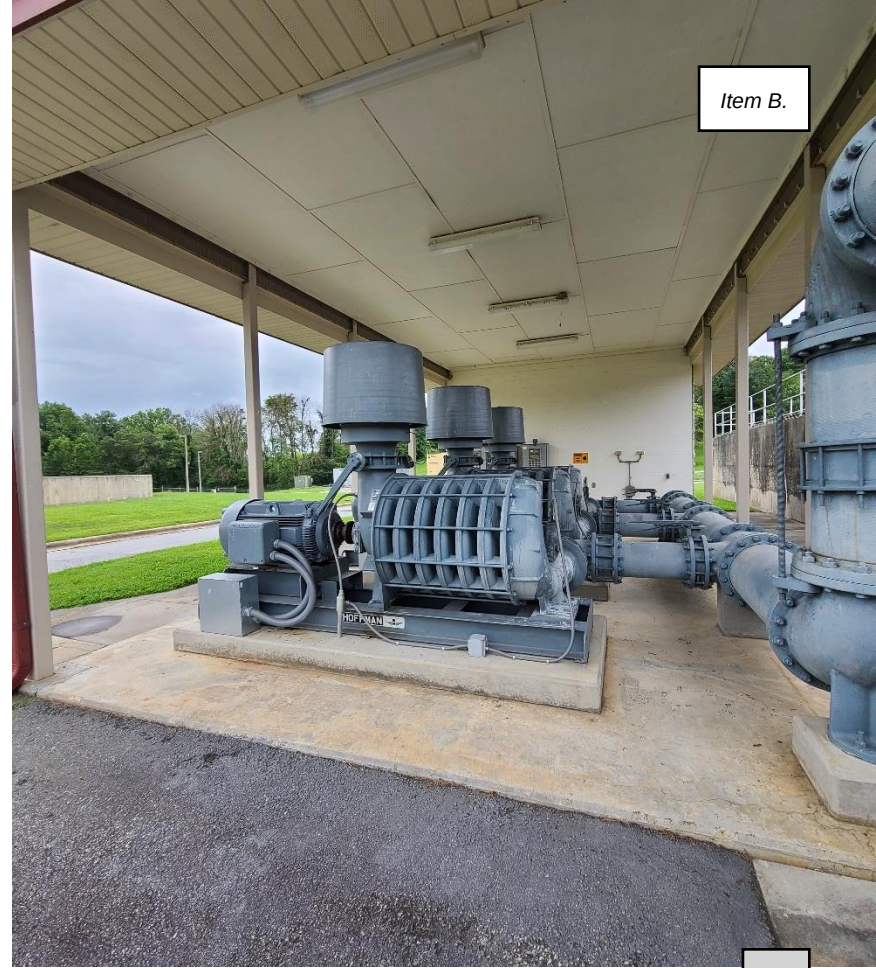


BLOWER BUILDING IMPROVEMENTS

- Replace aging blowers
- Provide variable speed control to improve energy efficiency and treatment process control
 - Costs partially offset by energy savings
- Perform structural repairs and enclose building

**Estimated Total Project Cost =
\$2,300,000**

Item B.



LONG TERM IMPROVEMENTS

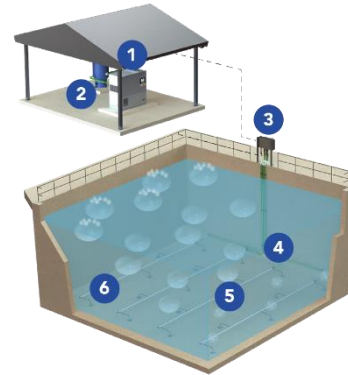
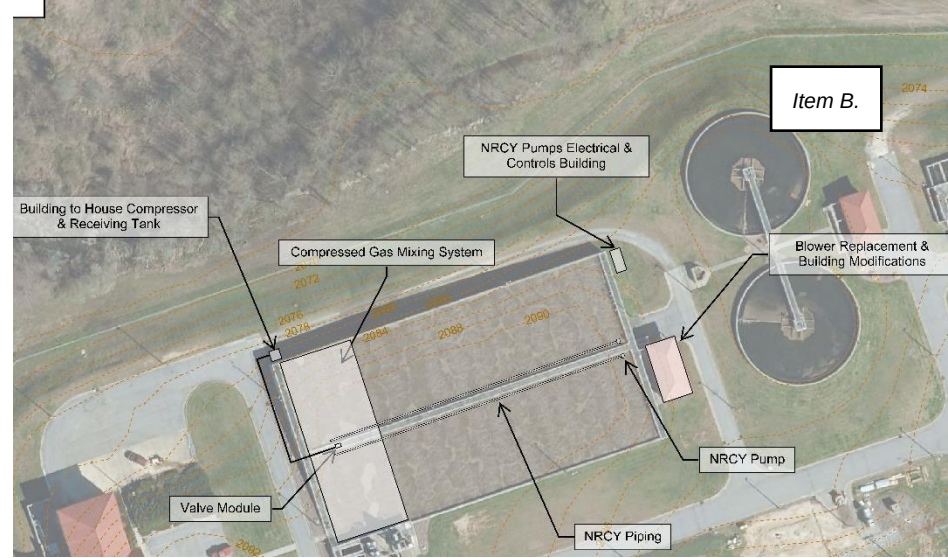
Item B.

1. Biological Process Conversion
2. Sludge Dewatering Belt Filter Press Replacement
3. Future Expansion to 7.8 MGD

BIOLOGICAL PROCESS CONVERSION

- Convert extended aeration process to MLE process
- Provides nitrogen removal and natural alkalinity recovery
- Convert first diffuser grid to anoxic zone
- Install internal recycle pumps and piping

**Estimated Total Project Cost =
\$1,700,000**



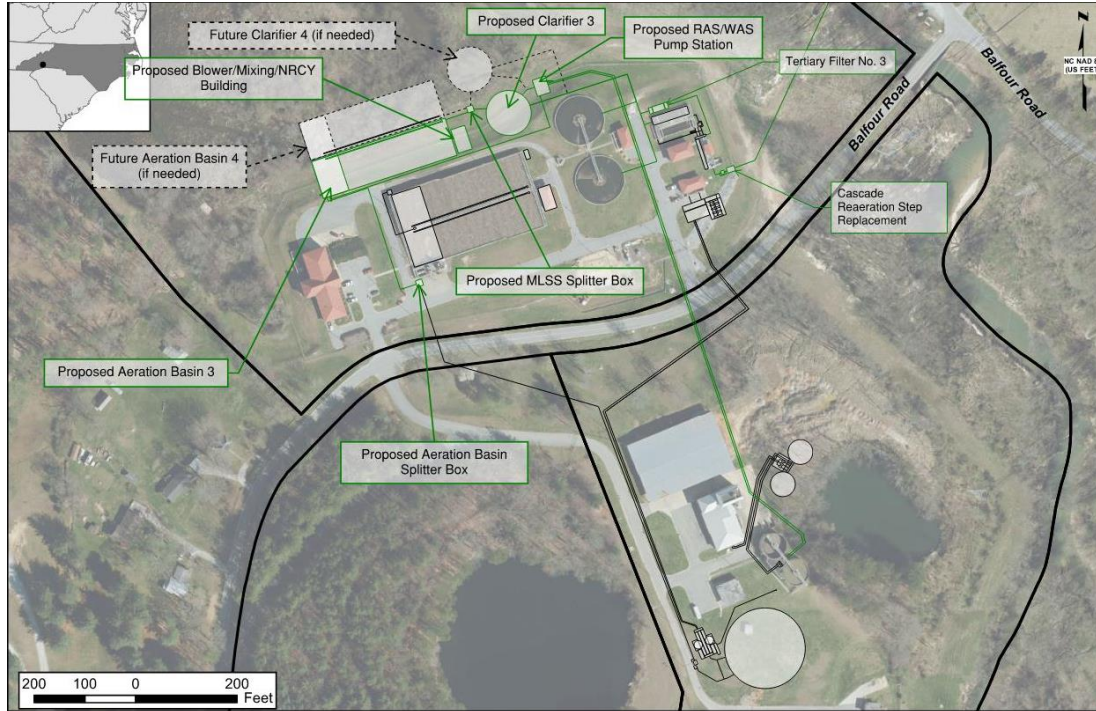
BELT FILTER PRESS REPLACEMENT

- Replace aging equipment
- Expand dewatering capacity in existing footprint
- Automate dewatering operation

**Estimated Total Project Cost =
\$1,800,000**



FUTURE WWTF EXPANSION

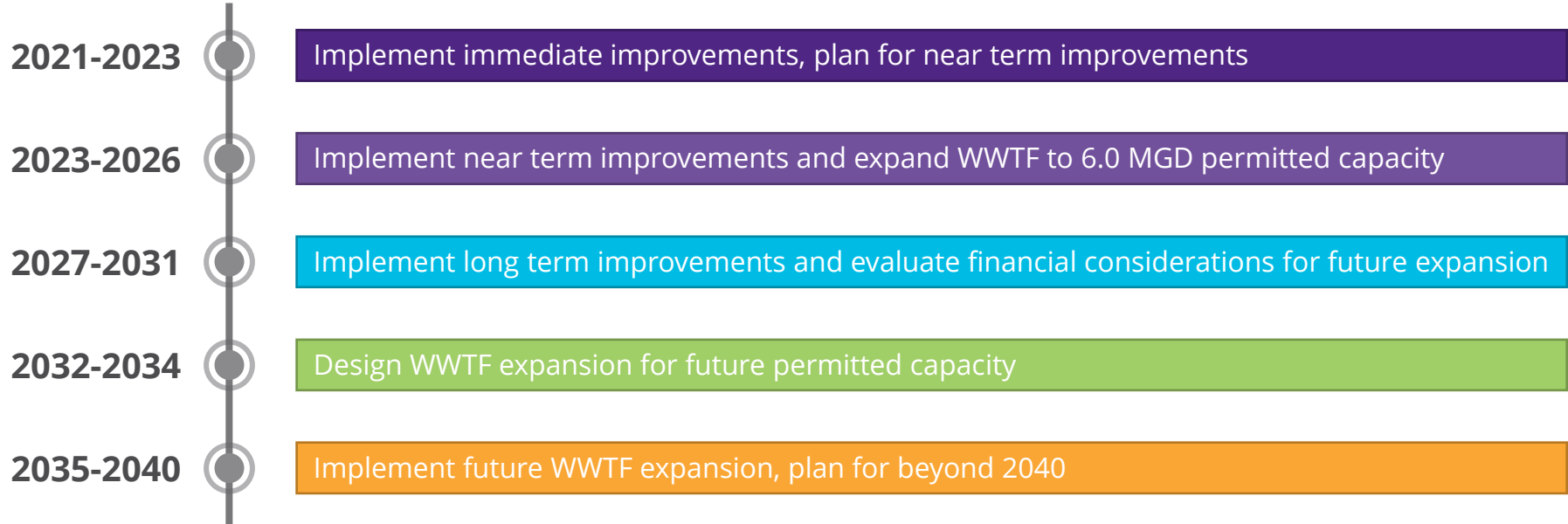


- Expand facility to meet 2040 loading conditions
- Conventional MLE process most feasible compared to IFAS and BioMag processes
- Include accommodations for fourth train if ever needed

**Estimated Total Project
Cost = \$26,000,000**

IMPLEMENTATION TIMELINE

Item B.





**THANK YOU
FOR THE
OPPORTUNITY**