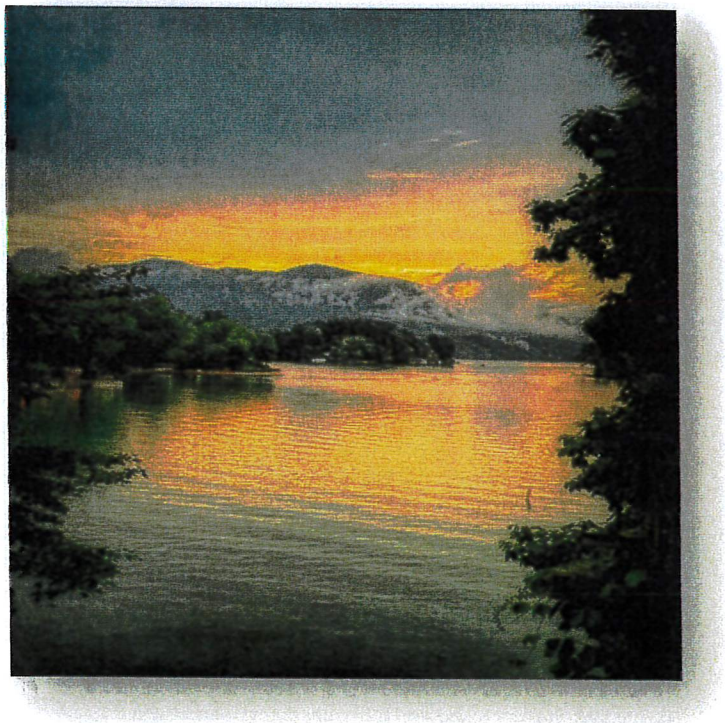
Town of Lake Lure
est. 1927 North Carolina

Community Forum

Town of Lake Lure Vision Statement:
"Lake Lure, the gem of the Carolinas, is a mountain lake community that has a harmonious balance of interests of our citizens, businesses and visitors, achieved through open communication and managed growth that emphasizes fiscal responsibility and stewardship of our natural beauty and environment."



July 28, 2020
Lake Lure Classical Academy

Town of Lake Lure
Special Community Meeting

Tuesday, July 28, 2020
Three Sessions: 10:00 a.m.; 2:00 p.m.; 6:00 p.m.
Lake Lure Classical Academy Gymnasium

Agenda

1. Call to Order
    - Invocation
    - Pledge of Allegiance

2. Agenda Adoption

3. Welcome and Opening Remarks – Mayor Pritchett
    - Ground Rules – Moderator Scott Dadson

4. Sewer System Alternatives Presentation – LaBella Associates

5. Dam Alternatives Presentation – Schnabel Engineering

6. Dredging Overview – Kurt Wright

7. FY 2020-2021 Budget Overview – WithersRavenel

8. Lobbying Services – Steve Metcalf and John Metcalf – The Policy Group

9. Question and Answer Session (Questions via Comment Cards)

10. Adjournment

Town of Lake Lure
Special Community Meeting Panels

Consultants (Left table on stage):
1. Carol Pritchett , Mayor, Town of Lake Lure
2. Kurt Wright, SDG Engineering
3. Reese Walsh, LaBella Associates

Podium: Scott Dadson (Moderator) Executive Director, Isothermal Planning and Development Commission

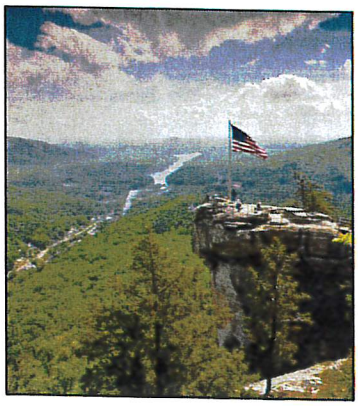
Consultants (Right table on stage):
4. Jonathan Pittman, Schnabel Engineering
5. Steve Metcalf, The Policy Group
6. John Metcalf, The Policy Group
7. Seth Robertson, WithersRavenel/WR Martin

Lake Lure Town Council (Left table in front of stage):
8. John Moore, Mayor Pro Tem
9. Patrick Bryant, Commissioner
10. David DiOrio, Commissioner
11. John Kilby, Commissioner

Technical Representatives (Right table in front of stage):
12. Shannon Baldwin, Town Manager, Town of Lake Lure
13. Sam Karr, Finance Director, Town of Lake Lure
14. Landon Davidson, NCDEQ, Water Resources - Water Quality Regional Operations
15. George Eller, NCDEQ Dam Safety Officer

Town of Lake Lure Department Heads and Staff
16. Mitchell Anderson, Assistant Community Development Director
17. David Arrowood, Public Works Director
18. Dean Givens, Parks, Recreation, and Lake Director
19. Sean Humphries, Police Chief
20. Michelle Jolley, Town Clerk
21. Laura Krejci, Communications Specialist
22. Dean Lindsey, Dam and Hydro-Electric Plant Director
23. Linda Ward, Customer Service Specialist
24. Dustin Waycaster, Fire Chief/Emergency Management Coordinator

Investing in Lake Lure for Future Generations
By: Lake Lure Town Council
July 2020



Your Town leadership is dedicated to keeping Lake Lure beautiful for generations to come. We are at a nexus of infrastructure needs. A significant investment in key infrastructure areas is critical if the Town of Lake Lure is to thrive in the future. We cannot do this alone, but we must do our part. The 1927 Lake Lure dam and sewer system are quickly approaching the end of their service life and we must act quickly to preserve the Lake. The aging infrastructure threatens local economic prosperity, property values, and our overall quality of life. The state regulatory authorities for Water Quality and Dam Safety have both mandated the refurbishment of our sewer system and dam to meet contemporary engineering standards. We have partnered with the best engineering firms available and worked closely with the state agencies to develop a long-term infrastructure plan. The Town is working to resource the plan from multiple sources, but it is clear that we must pursue additional funding from our local residents to move ahead. The Town has successfully implemented efficiency measures to mitigate the financial stresses on local taxes and user fees, but more is required. Higher user fees, water and sewer rates, and taxes are needed to build a strategic infrastructure reserve and provide vital seed money.

The task is daunting. Lake Lure is surrounded by the exquisite rocky and steep mountainous landscape that is subject to sedimentation, prone to landslides, and hinders construction access. Since the Town acquired the Lake in 1965, the low population density and overwhelmingly skewed residential tax base (95%), combined with the minimal investment that has historically been made to support the Town's infrastructure, a substantial investment is now unavoidable to achieve the large scale repairs and improvements that are required. These investments cannot be delayed. We have time to respond, but preserving our Lake will require an aggressive plan to foster federal and state legislative support, promote public-private partnerships, and tax payer investment to set the conditions for our long-term success.

Lake Sustainment: The Town has been working to create self-sustaining operational enterprises to maintain a balanced budget and increase our capacity to assume infrastructure debt. Basic Lake maintenance and operations are funded from Lake user fees and taxes. Parks, Recreation, and Lake Operations are about 95% self-sustaining (funded from non-tax related fees) and is projected to be fully sustainable within two years. Increased Lake user fees, (commercial and residential boat permits, marina and golf concessions, boat slip fees etc.) will be required to supplement revenues for Parks, Recreation, and Lake Operations, including annual dredging. Despite efforts to limit sedimentation and debris from entering our Lake, it is estimated that more than 40,000 tons or 33,000 cubic yards of sediment move through the watershed and into Lake Lure each year. This requires an annual contribution of approximately $425k per year going forward to conduct maintenance dredging.

Sewer: The 1927 Lake Lure gravity fed subaqueous (under lake) sewer system (SASS) collects and conveys sewage within submerged pipes. This is a one-of-a-kind sewer system; the only one in NC. There are only a handful similar to this in the USA. The SASS, which treats sewage downstream, is plagued with massive lake water infiltration and outdated equipment. The unique collection and chemical treatment systems protect the Lake environment but does not meet contemporary water quality standards. A phased rehabilitation and eventual system replacement approach is necessary to maintain sewage service while improving system performance. The design and implementation of a state-of-the-art engineering solution is challenging because it is under the Lake (subaqueous).

The Town is working closely with the NC Dept. of Environmental Quality – Division of Water Resources and has hired LaBella Associates, a firm specializing in wastewater infrastructure, to develop a sequential

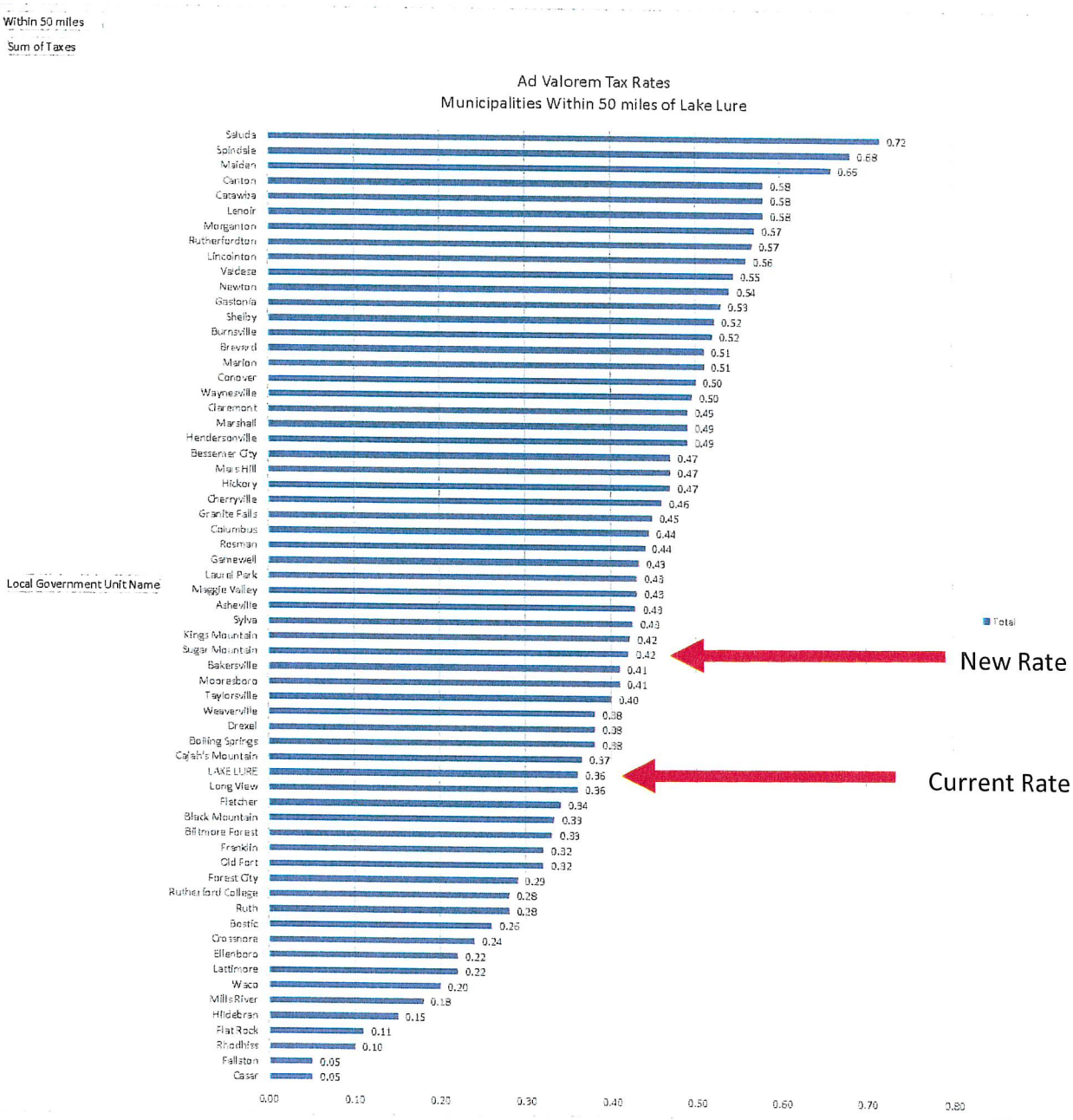
engineering solution that leverages modern sewage collection and treatment technology. In February 2020, LaBella developed and analyzed twelve alternative engineering solutions that are currently under review. A modern subaqueous collection and treatment system is feasible, but the costs for a new system is anticipated to be in excess of $40M. This investment will require a 30% increase in water use and sewer rates to support a long-term loan debt service. This budget involves a transfer to the Water and Sewer Fund in the amount of $551,442.

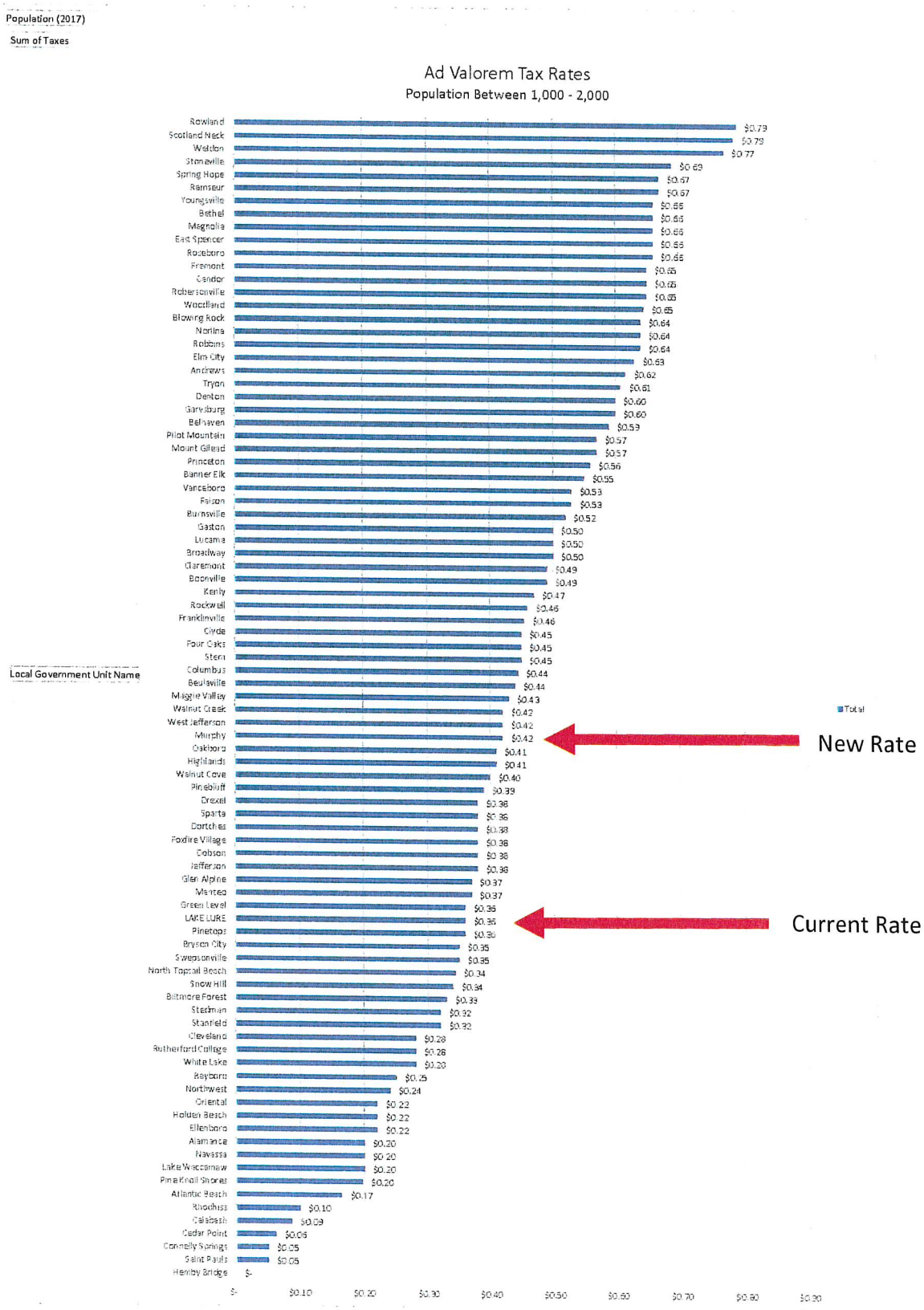
Lake Lure Dam: The original dam and hydro-electric power generation infrastructure, conceived and built in 1926, is near the end of its service life and does not meet contemporary engineering design standards. The Town has been awarded some grant funding to help defray the excessive cost of repairing the Dam; however, additional state funds will be required to meet federal standards. The Town has hired Schnabel Engineering, a nationally recognized dam engineering firm, who is currently pursuing engineering alternatives for Town Council's review. It is clear that a keystone of any solution is the installation of a low-level outlet (reservoir drain/sewer access valve to provide a capacity to drain the Lake to facilitate the sewer system replacement and serve as an emergency release valve in case of an epic seismic or rain event. This is a requirement of the NC Dam Safety Office. This valve will provide a measure of safety in the near-term until a final dam solution is designed and resourced.

Dam Solution: The Lake Lure Town Council and Leadership are fostering federal and state interagency collaboration and pursuing outside investment to design and resource a joint engineering solution. The goal is to reinforce the existing dam or build a new Lake Lure Dam and rehabilitate the Town's sewer system. The Town has partnered with North Carolina regulatory agencies to find the most efficient and cost-effective solution without compromising the environment, system performance or user service. The Town is ready to approve a first phase design and begin construction operations in the winter of 2020-2021. Data from the winter project will inform continued design and implementation decisions for a comprehensive multi-year program.

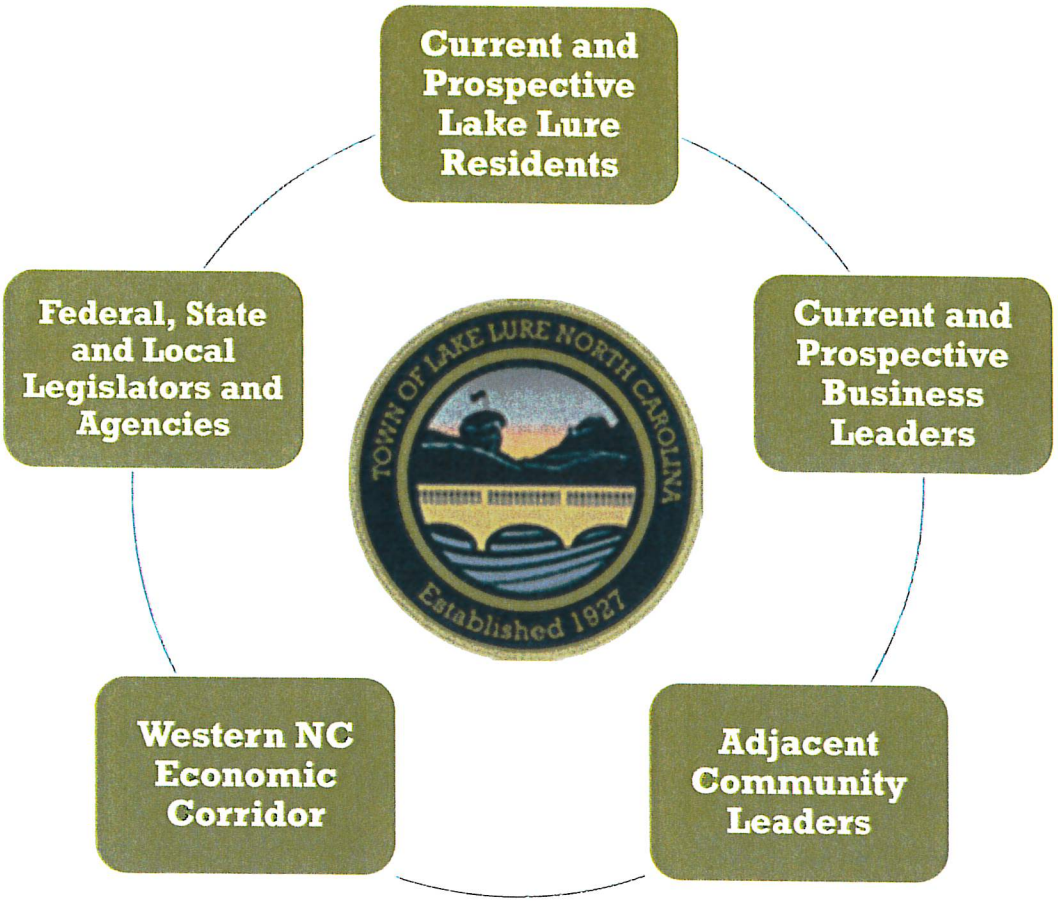
Funding: To leverage external funding sources and solidify state political support, the Town has hired a lobbying firm, The Policy Group, to engage state and federal elected officials to initiate legislative action in support of Lake Lure. Town leaders are also promoting private investment and public-private partnerships to bolster commercial ventures. The Town, working with the local Chamber of Commerce, is also promoting local tourism to stimulate economic activity that will increase the commercial tax base and promote self-sustaining Parks, Recreation, and Lake Operations.

Conclusion: Your Town leadership understands the hardships associated with increasing taxes and user fees, and we are committed to making good use of your hard-earned dollars. We are facing a convergence of state-mandated repairs, renovations, and replacements that will cost in excess of $100 million dollars over the next several decades. The resourcing of these projects is beyond the capacity of our small tax base, but we have to build a strategic cash reserve to bolster confidence in state agencies and outside investors. Lake Lure, in good faith, must impose new fees and taxes in conjunction with seeking external financial support. About two-thirds of your property taxes fund County services and only one-third may be applied to Lake Lure municipal services and infrastructure. The Town leadership has worked diligently over the past several years to keep Lake Lure's tax rate in the lower third of municipalities within a 50-mile radius (see Attachment A) and for towns with a similar size population (see Attachment B). An Ad Valorem Tax Rate increase from .36 to .42 is in keeping with similar municipal rates and is essential to maintain adequate public safety (Police and Fire), Parks, Recreation, and Lake Operations, and to move forward with the aforementioned infrastructure projects. This increase will result in a transfer to the Capital Reserve Fund in the amount of $483,936. It is vital that the Town demonstrates to potential federal and state funding sources that we are doing everything on our part to implement the long-term infrastructure plan. If we are going to succeed, we are going to need their partnership for future funding. We ask for your understanding and support. **Together, we will overcome our daunting infrastructure needs to successfully secure the natural beauty and prosperity of our Lake for generations to come.**


Within 50 miles
Sum of Taxes
Ad Valorem Tax Rates
Municipalities Within 50 miles of Lake Lure
Local Government Unit Name
Total
Saluda 0.72
Spindale 0.68
Maiden 0.66
Canton 0.58
Catawba 0.58
Lenoir 0.58
Morganton 0.57
Rutherfordton 0.57
Lincolnton 0.56
Valdese 0.55
Newton 0.54
Gastonia 0.53
Shelby 0.52
Burnsville 0.52
Brevard 0.51
Marion 0.51
Conover 0.50
Waynesville 0.50
Claremont 0.49
Marshall 0.49
Hendersonville 0.49
Bessemer City 0.47
Mars Hill 0.47
Hickory 0.47
Cherryville 0.46
Granite Falls 0.45
Columbus 0.44
Rosman 0.44
Gamewell 0.43
Laurel Park 0.43
Maggie Valley 0.43
Asheville 0.43
Sylva 0.43
Kings Mountain 0.42
Sugar Mountain 0.42
Bakersville 0.41
Mooresboro 0.41
Taylorsville 0.40
Weaverville 0.38
Drexel 0.38
Boiling Springs 0.38
Cajah's Mountain 0.37
LAKE LURE 0.36
Long View 0.36
Fletcher 0.34
Black Mountain 0.33
Biltmore Forest 0.33
Franklin 0.32
Old Fort 0.32
Forest City 0.29
Rutherford College 0.28
Ruth 0.28
Bostic 0.26
Crossnore 0.24
Ellenboro 0.22
Lattimore 0.22
Waco 0.20
Mills River 0.18
Hildebran 0.15
Flat Rock 0.11
Rhodhiss 0.10
Fallston 0.05
Casar 0.05
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
New Rate
Current Rate


Population (2017)
Sum of Taxes
Ad Valorem Tax Rates
Population Between 1,000 - 2,000
Local Government Unit Name
Total
New Rate
Current Rate
Rowland $0.79
Scotland Neck $0.79
Weldon $0.77
Stonaville $0.69
Spring Hope $0.67
Rainseur $0.67
Youngsville $0.66
Bethel $0.66
Magnolia $0.66
East Spencer $0.66
Roseboro $0.66
Fremont $0.65
Candor $0.65
Robersonville $0.65
Woodland $0.65
Blowing Rock $0.64
Norlina $0.64
Robbins $0.64
Elm City $0.63
Andrews $0.62
Tryon $0.61
Denton $0.60
Garysburg $0.60
Belhaven $0.59
Pilot Mountain $0.57
Mount Gilead $0.57
Princeton $0.56
Banner Elk $0.55
Vanceboro $0.53
Faison $0.53
Burnsville $0.52
Gaston $0.50
Lucama $0.50
Broadway $0.50
Claremont $0.49
Booneville $0.49
Kenly $0.47
Rockwell $0.46
Franklinville $0.46
Clyde $0.45
Four Oaks $0.45
Stem $0.45
Columbus $0.44
Beulaville $0.44
Maggie Valley $0.43
Walnut Creek $0.42
West Jefferson $0.42
Murphy $0.42
Oakboro $0.41
Highlands $0.41
Walnut Cove $0.40
Pinebluff $0.39
Drexel $0.38
Sparta $0.38
Dortches $0.38
Foxfire Village $0.38
Dobson $0.38
Jefferson $0.38
Glen Alpine $0.37
Manteo $0.37
Green Level $0.36
LAKE LURE $0.36
Pinetops $0.36
Bryson City $0.35
Swepsonville $0.35
North Topsail Beach $0.34
Snow Hill $0.34
Biltmore Forest $0.33
Stedman $0.32
Stanfield $0.32
Cleveland $0.28
Rutherford College $0.26
White Lake $0.23
Bayboro $0.25
Northwest $0.24
Oriental $0.22
Holden Beach $0.22
Ellenboro $0.22
Alamance $0.20
Navassa $0.20
Lake Waccamaw $0.20
Pine Knoll Shores $0.20
Atlantic Beach $0.17
Rhodhiss $0.10
Calabash $0.09
Cedar Point $0.05
Connelly Springs $0.05
Saint Pauls $0.05
Henby Bridge $-
$- $0.10 $0.20 $0.30 $0.40 $0.50 $0.60 $0.70 $0.80 $0.90

Town of Lake Lure Key Stakeholders

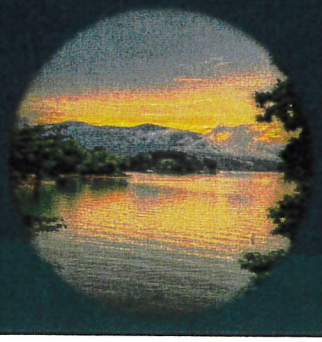


Welcome to the

Town of Lake Lure

est. 1927 North Carolina

Community Forum



Town of Lake Lure's Multiple Priority Infrastructure Projects

Financial
Withers/Ravenel & The Policy Group

Dam
Schnabel Engineering

Sewer
LaBella Associates

Dredging
Contractors

Holistic Long-Term Approach

Town of Lake Lure North Carolina

LaBella
Powered by partnership

JULY 28, 2020

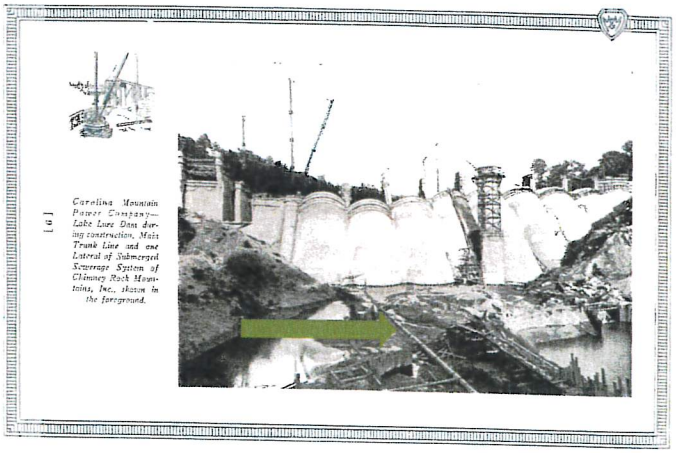
Special Community Meeting

Subaqueous sanitary sewer &
Wastewater treatment plant

Project Background

Subaqueous Sanitary Sewer (SASS)

- Completed with the Dam in 1927
- Ranges from 4' to 105' feet deep
- Consists of c. 74,000 linear feet cast iron pipe
- Serves a population of 1,214 year round and up to 5,000 seasonally
- Serves public/private connecting systems

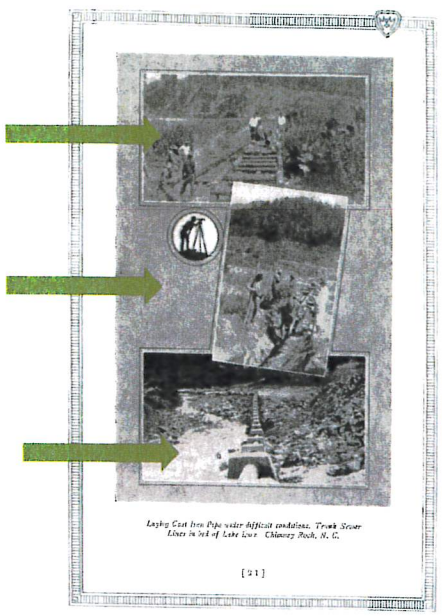


Carolina Mountain Power Company—Lake Lure Dam during construction. Main Trunk Line and one Lateral of Submerged Sewerage System of Chimney Rock Mountains, Inc., shown in the foreground.

Project Background

Subaqueous Sanitary Sewer (SASS)

- Installed using various methods
  - Wood cribbing
  - Buried
  - Concrete collars
- Installed along the existing grade
- Ranges in size from 8" to 18" in diameter
- Contains various bends and submerged junction boxes
- Flow enters through 65 perimeter manholes
- Location of manholes are known
- Location of much of the SASS is approximate



Project Background

Wastewater Treatment Plant (Plant)

- Prior to 1969 the SASS discharged to the Broad River
- Constructed in 1969
  - Rated at 350,000 gallons per day
  - Biological Process
- 1991 Renovation
  - Converted to a physical-chemical process (P/C) due to lake infiltration
  - Rated at 995,000 gallons per day
- Notice of Violations
  - Flow rate
  - Ammonia
  - Total suspended solids

Recent Projects

2007 Inspection and Smoke Testing

- Most of the manholes were inspected
- Identified and repaired manhole and private lateral leaks
- CCTV of approximately 14% of the SASS
- Divers found leaks in the submerged joints

2009 Pipe Wrap Project

- Some of the accessible pipe joints were wrapped
- Reduced the amount of Lake Infiltration
- 15 year service life (2024)

Emergency Shutoff Valve

- Installed downstream of the Dam
- Shutoff flow in the event of catastrophic SASS failure
- Would require the Town to suspend sewer usage

Existing conditions

Subaqueous Sewer System

- Non-compliant with the NC-DWR
- Identified by EPA as problematic
- At risk of complete failure
- Pipes are deteriorating
- Would result in a "no flush" order

Wastewater Treatment Plant

- Non-compliant with the NC-DWR
- Long history of violations and fines
- Cannot meet the current NPDES limits
- Primary issues
  - Lake infiltration

Existing conditions

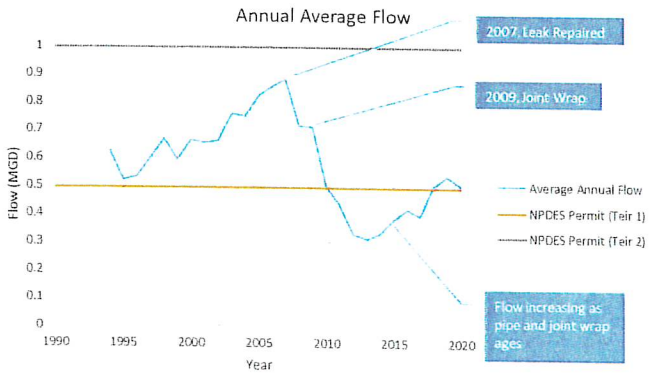
Problematic laterals

- Installed below the water line
- Under structures
- Subject to leaks caused by damage to the line
- Large number of submerged joints

Existing conditions

The primary issue facing the Sewer System and the Wastewater Treatment

Lake Infiltration



Define the and objectives

Summary of Objectives

- Regulatory Compliance (short term and long term)
- Protect against catastrophic failure
- Provide a sustainable, enduring collection and treatment system
- Financially viable
- Accessible for Operations and Maintenance
- Incorporate future growth
- Reduce inflow and infiltration
- Long Service Life

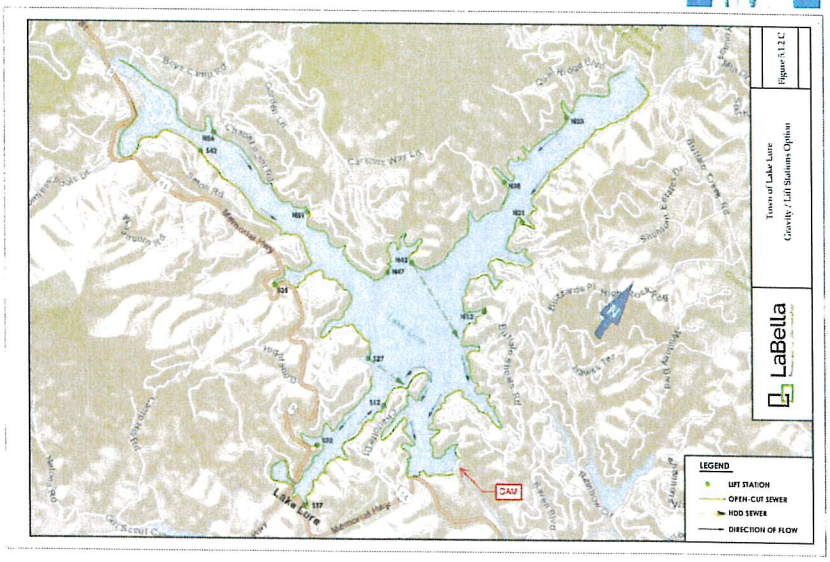
Proposed solutions

The perimeter system would be installed in phases around the lake perimeter, and would include:

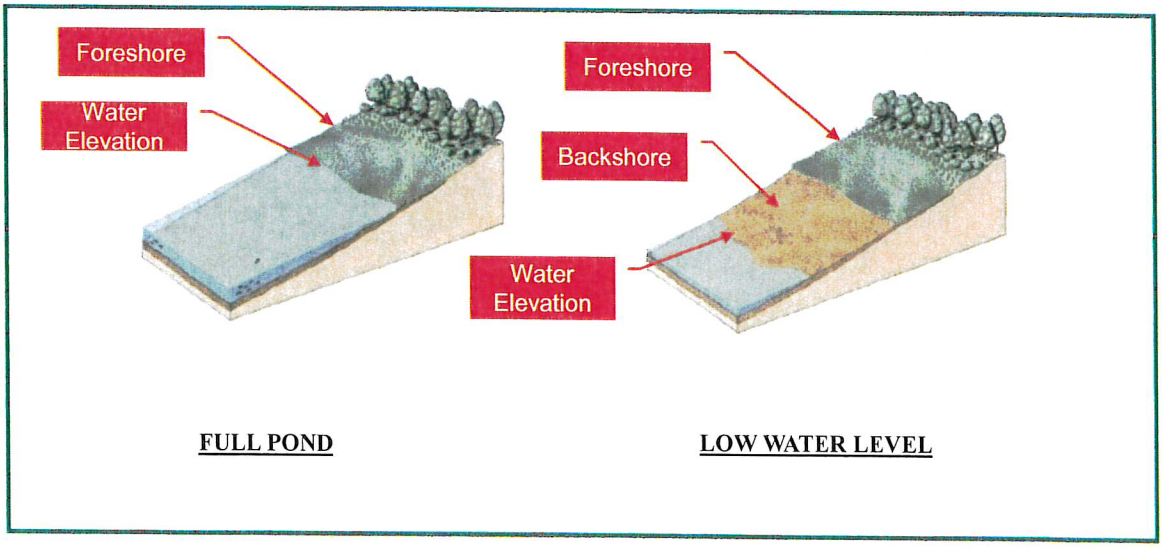
- HDPE sewer lines
- Manholes
- Pump stations
- Laterals

Rehabilitate the existing manholes not replaced in Phase 1.

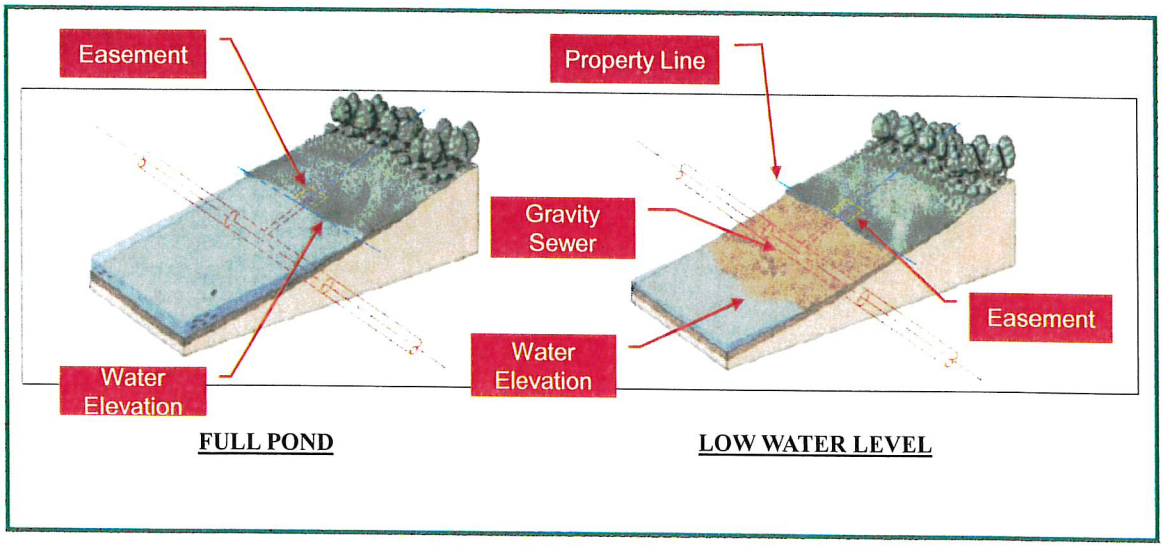
Phase 1 would begin at the dam and continue along the northern and southern shoreline.



Project location



Project location



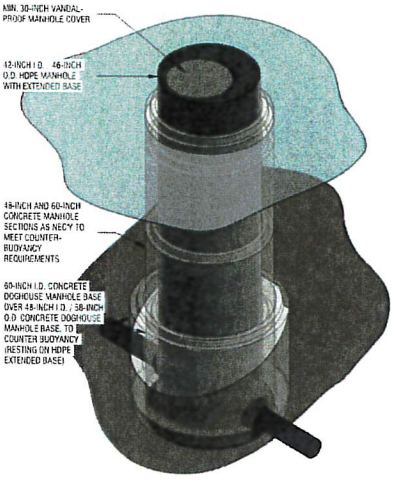
Possible solutions

Subaqueous Sanitary Sewer Alternatives

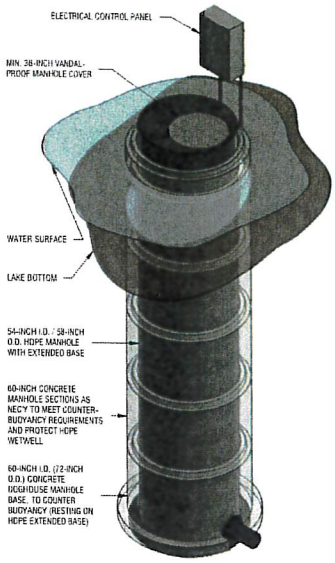
Alternative	Cost Order of Magnitude	Phase-able	Consider Further
S1 - Do Nothing	n/a		
S2 - Land-based Low Pressure Sewer System	$50M - $65M	✓	
S3 - Backshore Low Pressure Sewer System	$30M - $40M	✓	✓
S4 - Backshore Series Pump Station System	$30M - $40M	✓	✓
S5 - Backshore HDPE Gravity System	$25M - $35M	✓	
S6 - Backshore HDPE Gravity / Lift Station System	$30M - $40M	✓	✓
S7 - Subaqueous Accessible Manholes	$20M - $30M	✓	
S8 - Tethered Buoyant HDPE System	$40M - $50M		
S9 - Submerged HDPE System	Not Established		
S10 - Drain and Replace Approach (if Dam renovation drains lake)	Not Established		
S11 - Repair & Rehabilitate Perimeter Manholes (partial solution)	$1M - $3M	✓	✓

Each alternative to be considered further involves infrastructure installed in the backshore area.

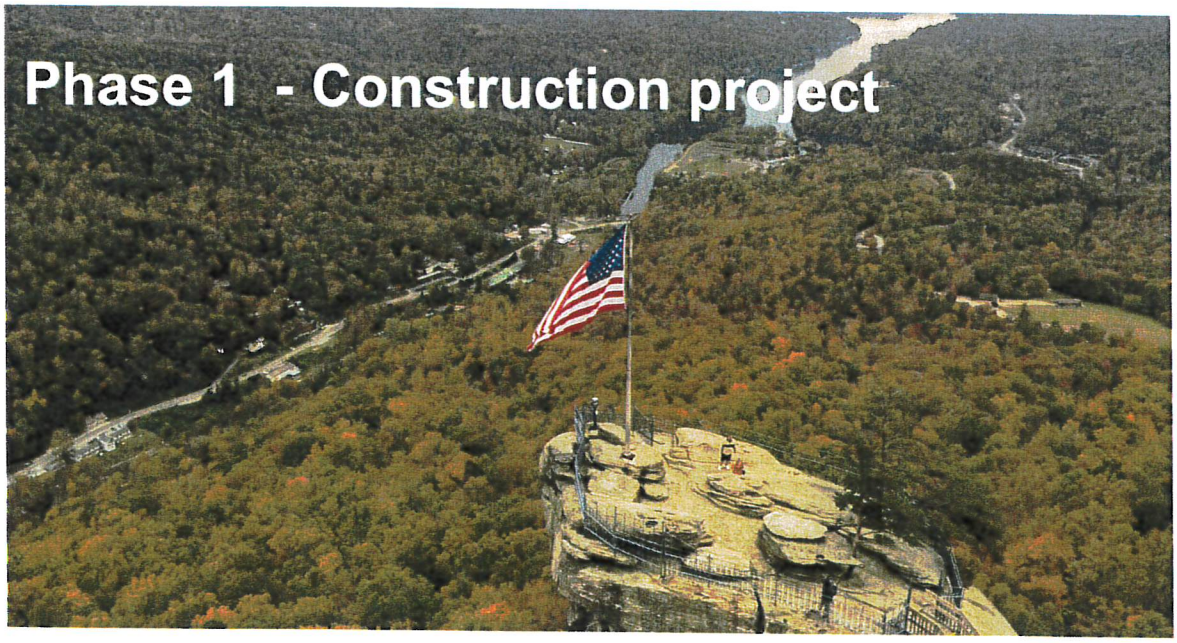
Proposed solutions



HDPE Manhole with Concrete shell



HDPE Pump Station with Concrete shell



Phase 1 – project components

Special Order by Consent (SOC)

A short-term solution in the form of a legal agreement between Lake Lure and NC DEQ.

- Protects from additional fines and penalties
- Protects from further regulatory involvement
- Protects from 3rd party litigation
- Would not reduce the risk of an SASS failure

NC Environmental Quality

Town of Lake Lure North Carolina

Phase 1 – project components

Manhole Rehabilitation

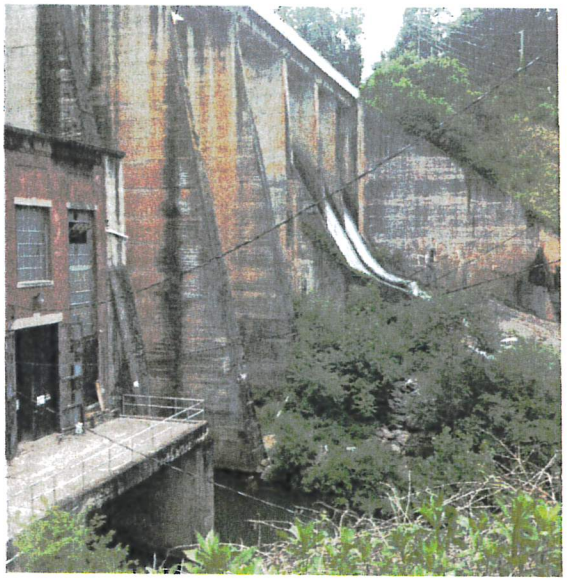
A mid-term solution

- Extend the life of the existing manholes
- Reduce the lake infiltration
- Will not reduce the risk of SASS failure

Phase 1 – project components

Sewer Access Valve/ Reservoir Drain

- Lower the lake below the spill way
  - Assist the construction and O&M activities
- Maintain a level below the spill way
- An important component of the emergency response plan that provide the ability to reduce the lake level.
  - Catastrophic SASS failure
  - Immanent dam failure

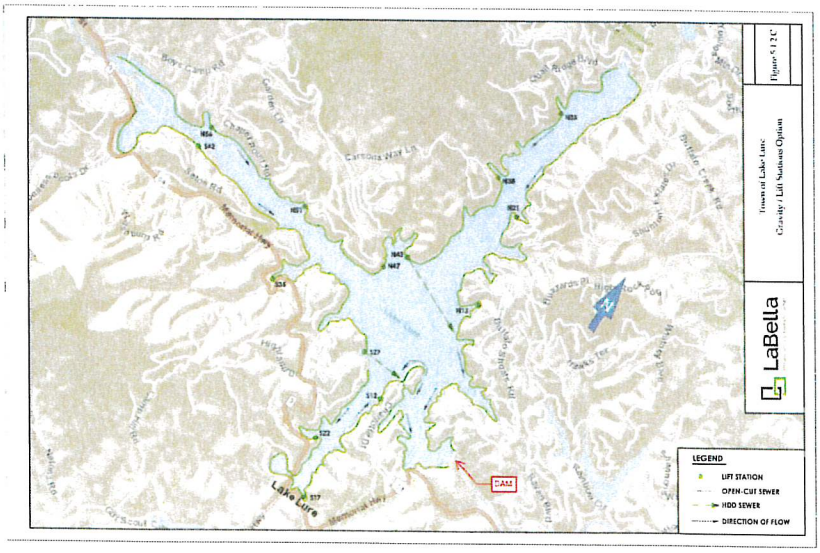


Phase 1 – project components

Perimeter Sewer System

A long term solution

- Provide service to areas not easily served
- Simplify the connection effort
- Eliminate the risk associated with the SASS
- Operations and maintenance can be completed year-round



Lake drawdown schedule

LAKE DRAW DOWN SCHEDULE WINTER 2020/2021
TOWN OF LAKE LURE, NC

	Each column represents a one-week time period starting with Monday as the first day of the week =====>	12/28/20	1/4/21	1/11/21	1/18/21	1/25/21	2/1/21	2/8/21	2/15/21	2/22/21	3/1/21	3/8/21
HYDROELECTRIC DEPARTMENT - Dean Lindsey												
1	Penstock inspection - Period for drawing down the lake 9' below NPE		4	12								
2	Penstock Inspection Work Performed (2 day duration)			13 - 14								
3	Penstock Work Completed			14								
LAKE MANAGEMENT DEPARTMENT - Dean Givens												
1	Dredging - special dredging of the "silt shelf" during lake drawdown by barge and excavator		Dredging to continue throughout this period									
PUBLIC WORKS DEPARTMENT - David Arrowood												
	(No need to include anything)											
LABELLA - Reese Walsh, PE												
1	Period for drawing drawn down the lake to 12' below NPE		4	15								
2	REFOI from Contractors interested in bidding the sewer project (This task must occur on a weekday)				18 - 20							
3	Geotechnical investigation (exact date TBD) (This task must occur on a weekday)				18-20							
4	Drone footage (exact date TBD) (This task must occur on a weekday)				18 - 20							
5	Refilling the Lake back to NPE				20	31						
SCHNABEL - Jonathan Pittman, PE												
	(No need to include anything)											
BEGINNING OF LAKE DRAW DOWN (Rate is 1 foot per day)			4									
LAKE EXPECTED TO BE 9-FEET BELOW NPE FOR PENSTOCK INSPECTION				12								
LAKE EXPECTED TO BE 12-FEET BELOW NPE FOR LABELLA'S WORK				15 - 20								
RE-FILLING OF THE LAKE TO BEGIN					20							
PERIOD OF TIME TO FILL LAKE BACK TO NPE (based on 1 foot per day					20	31						
LAKE EXPECTED TO BE AT NORMAL POOL ELEVATION (NPE)						31						
ROWERS ARRIVE AT LAKE LURE FOR TOURNAMENT							1					

Lake at 9 feet below NPE See Note 1

LaBella requests the lake to be drawn down 12 feet below NPDE. See Note 2

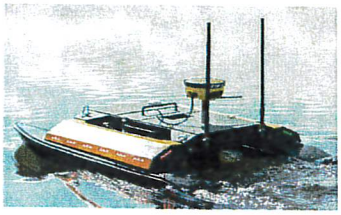
LaBella's work must occur on weekdays

Estimated date lake back at NPE based on refilling at 1 foot per day

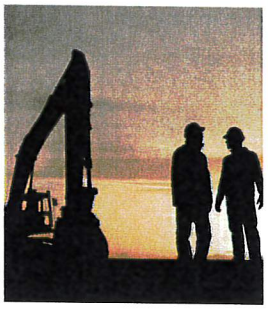
Rowing Tournament

Proposed Project Schedule

January 2021
- RF-EOI
- Geotechnical
- Surveying



Winter 2021-2022
- Phase 1 Construction



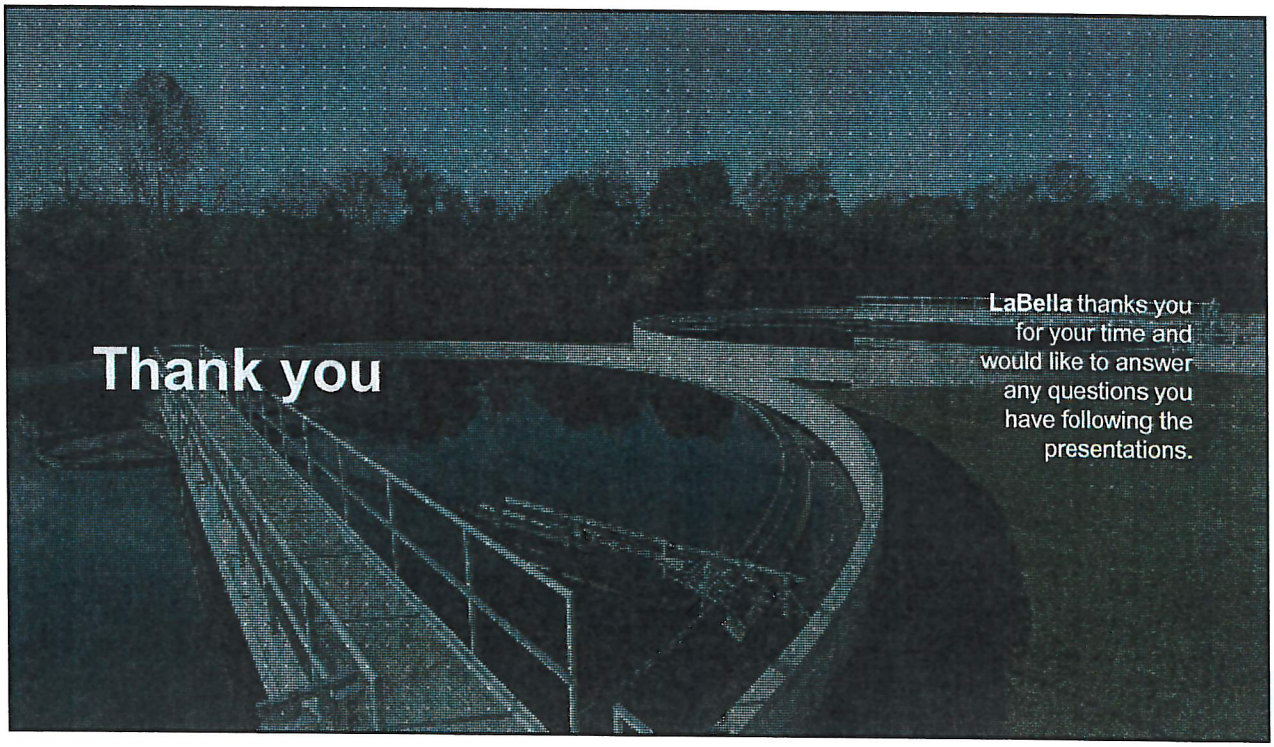
Community involvement

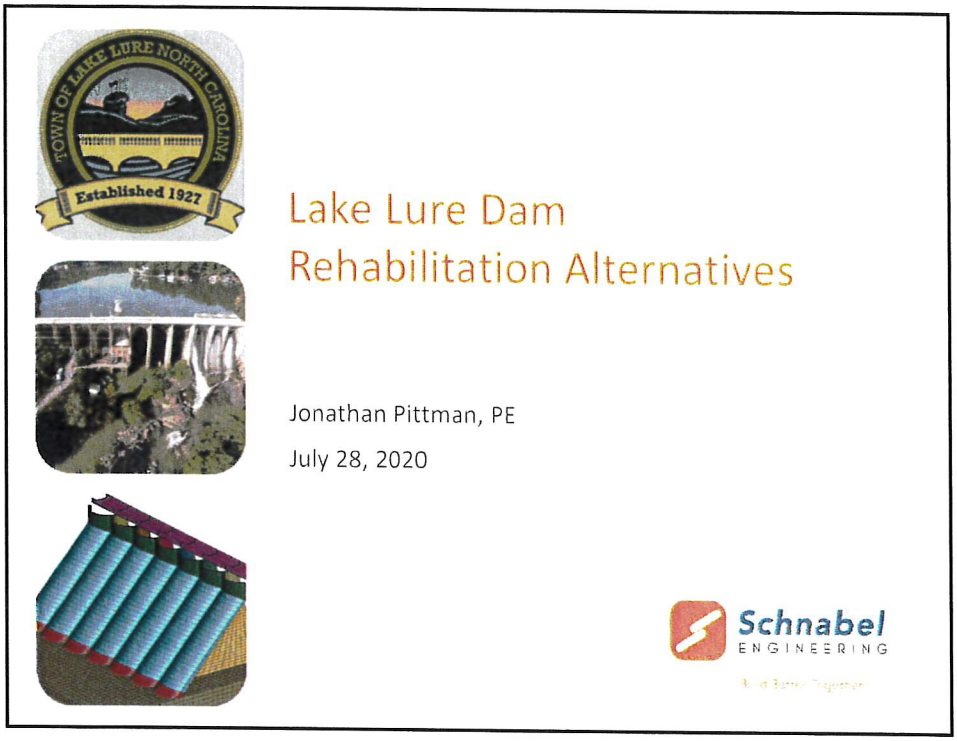
Lake Use

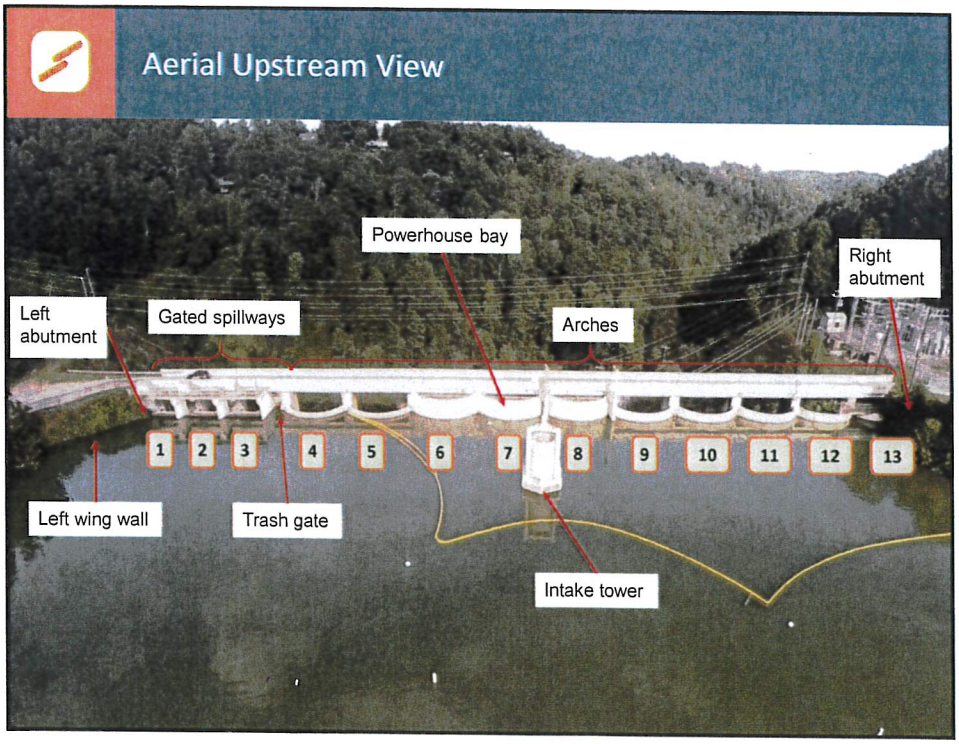
- The lake will be lowered around 20' for the construction period.
- Use of the lake will be restricted for the construction period.
- The proposed system will need to be protected from future lake structure construction.

Easements

- Temporary Easements
  - Construction access
- Permanent Easements
  - Lateral connections
  - Electrical connections
  - Generator locations




Lake Lure Dam
Rehabilitation Alternatives
Jonathan Pittman, PE
July 28, 2020
Schnabel
ENGINEERING


Aerial Upstream View
Powerhouse bay
Right abutment
Left abutment
Gated spillways
Arches
1
2
3
4
5
6
7
8
9
10
11
12
13
Left wing wall
Trash gate
Intake tower

Existing Conditions Assessment Major Findings

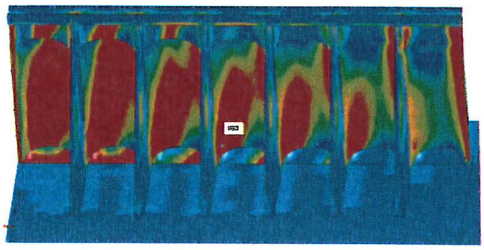
- Dam in overall Fair Condition
- Performed well during service life
- Several items that warrant repair, monitoring, and/or additional investigation/assessment
- NC Dam Safety Criteria for Very Large, High Hazard Dam:
  - Inadequate spillway capacity
  - Arch-buttress sections do not meet structural stability requirements for seismic loading
  - Gravity sections do not meet global stability requirements for each load case analyzed
  - No functional reservoir drain

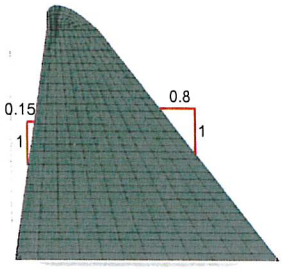
Alternatives Development – Primary Objectives

- Address NC Dam Safety Requirements
- Extend Service Life of Dam by 30+ Years
- Maintain Permanent Pool Level and No Increases in Upstream or Downstream Flooding
- Protect Existing Hydroelectric Facilities without Altering Their Operation or Structure
- Evaluate Options to Maintain Public Road across Dam
- Minimize Community Impacts during Construction
  - Access Across Dam
  - Depth and duration of reservoir drawdown

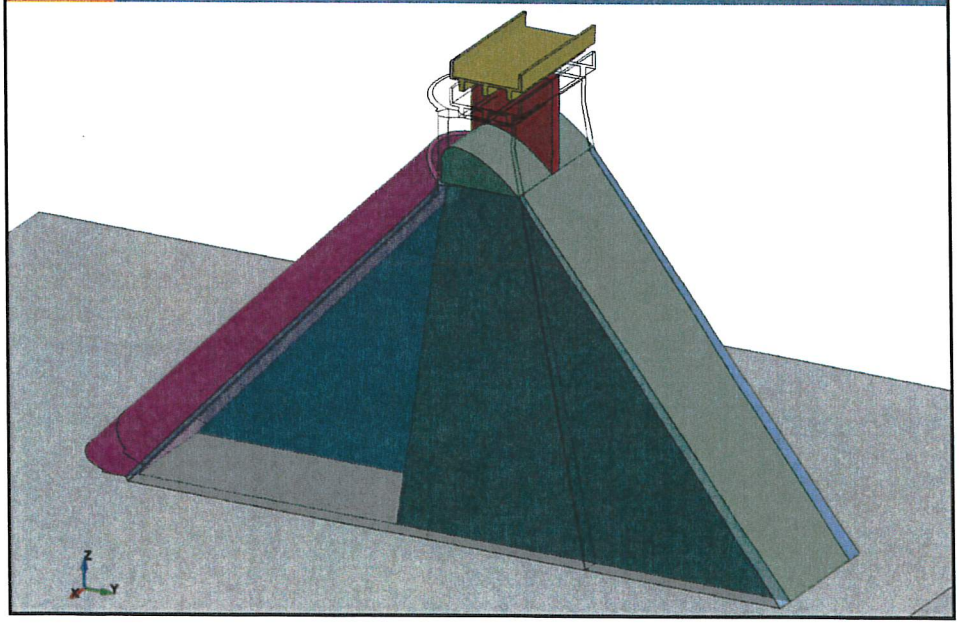
Dam Rehabilitation

- Increase hydraulic capacity by modifying crest shape and top of arch elevations
- Address arch-buttress seismic stability by infilling of bays with concrete
- Address gravity section stability with post-tensioned anchors
- Reservoir drain installation





Dam Rehabilitation



Other Rehabilitation Components

- Intake Tower
  - Structural rehabilitation likely required
  - Draining of lake likely required for construction
- Existing Spillway Gates and Trash Gate
- Abutment Retaining Walls
- Right Abutment Armoring
- Powerhouse (Bay 7) Structure Improvements
- Relocation of Bay 8 Electrical Infrastructure
- Downstream Access Road
- NCDOT Bridge
  - Independent Structure Requirements?
  - Single Lane vs. Double Lane

Dam Replacement

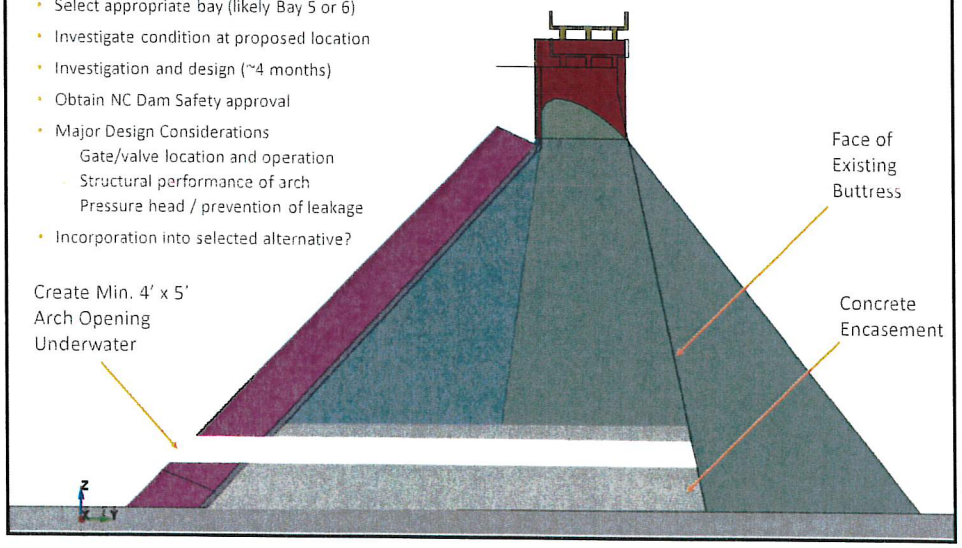
- New RCC gravity dam downstream of existing dam
- Could be designed to support a new bridge
- New hydroelectric facilities could be incorporated but would result in regulation by the FERC
- Additional environmental permitting likely required
- Major Construction Considerations
  - Construction could not be phased
  - Complete draining of the reservoir not required
  - Demolition of existing dam – partial demolition?

Comparison of Dam Rehabilitation vs. Replacement

- Estimated Service Life
  - Rehabilitation = 75+ Years
  - Replacement = 100+ Years
  - Greater O&M efforts/costs for rehabilitation over service life of dam
- Technical Performance – Lower risks for Replacement
- Existing Infrastructure – Fewer impacts for Rehabilitation (e.g., proposed sanitary sewer upgrades not affected)
- Community Impacts – Impacts greater for Rehabilitation (i.e., lake levels)
- Environmental – More complex for Replacement
- Project Phasing and Schedule – More flexibility for Rehabilitation
- Estimated Total Project Costs are Similar ($60M to $65M in 2019 dollars)
  - Additional $5M to $10M for replacement bridge
  - Additional $15M to $20M for new hydro

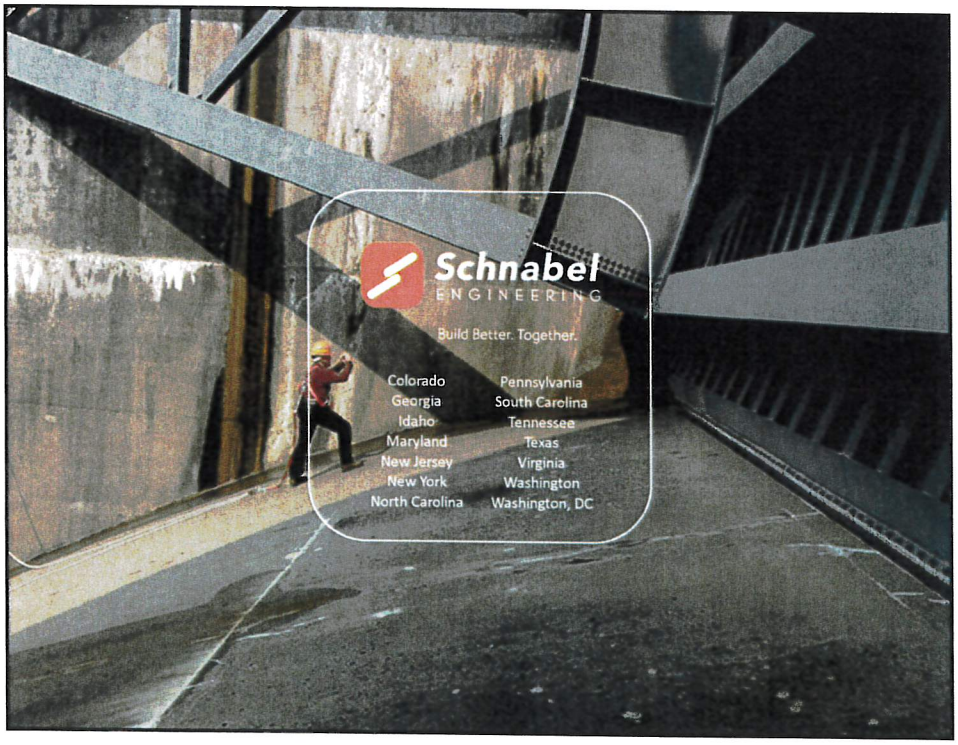
Reservoir Drain

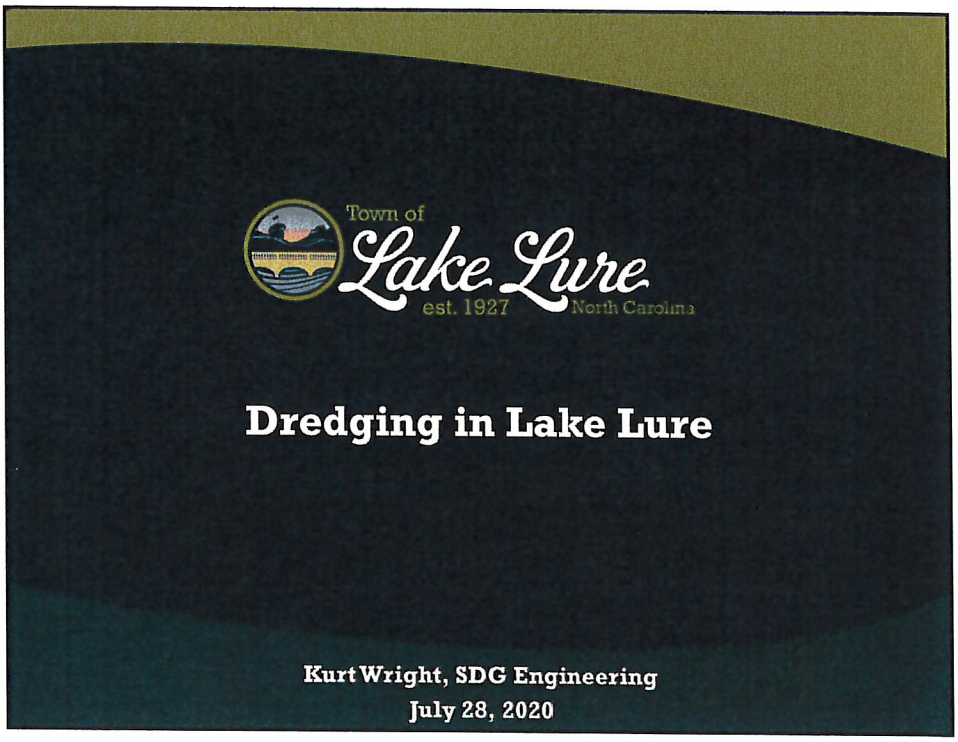
- Finalize required elevation and rate of drawdown
- Select appropriate bay (likely Bay 5 or 6)
- Investigate condition at proposed location
- Investigation and design (~4 months)
- Obtain NC Dam Safety approval
- Major Design Considerations
  - Gate/valve location and operation
  - Structural performance of arch
  - Pressure head / prevention of leakage
- Incorporation into selected alternative?



Proposed Path Forward

- Construct Reservoir Drain as Initial Phase of Work
  - Allows for critical sewer repairs and funding in-place for sewer repairs
  - Addresses a NC Dam Safety requirement and reduces dam safety risks
  - Provides benefits to necessary lake dredging
- Next Steps for Dam
  - Select preferred alternative
  - Evaluate phasing approach for rehab alternative (if selected) by performing an SQRA
  - Evaluate funding options and develop schedule for addressing remaining dam safety requirements
  - Meet with NC Dam Safety to agree on path forward
  - Coordination with NCDOT

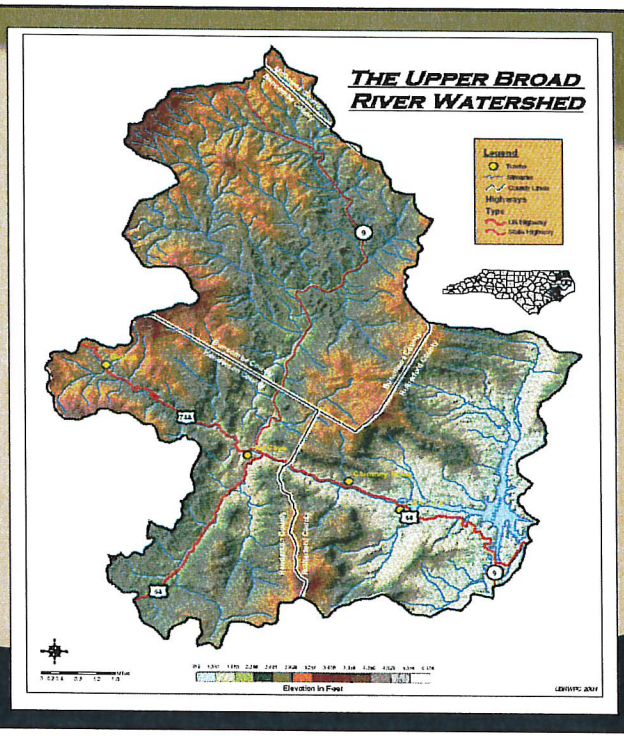




Dredging - Some Quick Facts:

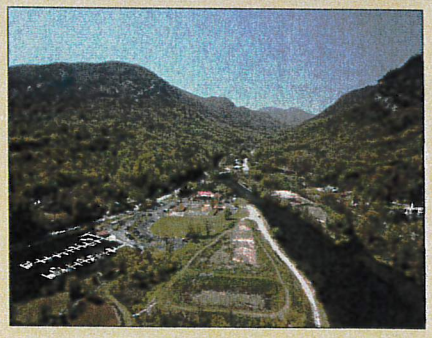
- ✓ The Town of Lake Lure is part of the **94 square mile** Upper Broad River Watershed.
- ✓ Elevations range from over 4,**000 feet** (4,412 feet at Little Pisgah Mountain) to just under 1,000 (990 feet is the surface elevation of Lake Lure).
- ✓ The watershed has steep topography with numerous sheer cliff faces.
- ✓ The most prominent geographical feature in the watershed is Hickory Nut Gorge, a 10-mile long gorge carved primarily by the Broad River and two prominent tributaries, Hickory Creek and Reedy Patch Creek.
- ✓ Soils are mostly highly erodible sandy loams and silty loams. Some refer to the soils as "sugar soils" as they seem to dissolve when they come in contact with water.
- ✓ It is estimated that **more than 40,000 tons or 33, 000 cubic yards of sediment per year** move through the watershed and into Lake Lure.

Dredging...



Dredging Facts:

- ✓ The Upper Broad Watershed lies within four counties (Buncombe, Henderson, Rutherford, and a small portion of McDowell).
- ✓ There are three unincorporated communities (Gerton, Bat Cave, and Broad River) along with two incorporated municipalities (Town of Lake Lure and Chimney Rock Village)
- ✓ The majority of the watershed is forested with scattered residential development, most of which is concentrated in the Hickory Nut Gorge area.



- ✓ There are numerous old logging roads, borrow sites, and dirt roads which tend to contribute substantial amounts of sediment, but there is quite a lot of natural sediment loading due to the steep topography and highly erodible soils.

Dredging Operations

Town of Lake Lure

Lake Lure Dredging Expenditures

A total of $1.9M In 10 years

Year	Actual Expenditures
2010	$100,00
2011	$100,000
2012	$75,000
2013	$100,000
2014	$62,000
2015	$125,000
2016	$177,800
2017	$261,060
2018	$71,750
2019	$469,480
2020	$310,850
TOTAL	**$1,852,940**

Historical 10 Year Average = $185,000/year

Town of Lake Lure

Maintenance Dredging

$425,000/Year Required for Maintenance Dredging Alone

Lake Lure

TOWN OF LAKE LURE

Capital Planning and Financing

Seth Robertson, PE
Community Forum
July 28, 2020

WithersRavenel
Our People. Your Success.

Background

- Town asked WithersRavenel to evaluate the General Fund, Electric Fund and Water and Sewer Fund to address the Town's short and long-term financial needs
  - Town is faced with the challenge of paying for large capital projects for the Dam and Wastewater System necessary to comply with state and federal requirements (Over $100 million total)
- Worked with Council and Staff over the last year to develop a 10-year Financial Plan for all three funds including identifying areas where costs could be reduced, anticipated capital needs and necessary revenue increases to pay for projected increases in capital, operations and maintenance expenses

WithersRavenel
Our People. Your Success.

Revenue Options within Funds

General Fund (Dam)

The primary source of revenue is property and sales taxes. But also includes fees, grants, etc. Large capital projects are generally covered through existing reserves, state and federal financing programs and general obligation bonds.

Enterprise Fund (Electric and Water and Sewer)

The primary source of revenue is the rates and fees paid by utility customers. Can also include grants, special appropriations, etc. Large capital projects are generally covered though existing reserves, state and federal financing programs and revenue bonds.

Challenges

- Both the Dam and the existing wastewater system configuration are incredibly unique and expensive to replace and maintain.
- The Town has a very small population to pay for the critical infrastructure.
- Available grant funds are very limited and are not available in the amounts necessary to fund large infrastructure projects.
- That makes is necessary for the town to finance these projects and pay for them through increases in taxes, fees and rates.
- Funds need to be in strong financial condition in order to be able take on debt.

Example

The increase was .06 per $100.00 evaluation.

The increase of .06 cent for every $100.00 would equal $60.

The taxes for a $200,000 home would increase by $120.00 per year.

The taxes for a $250,000 home would increase by $150.00 per year.

The Policy Group

The Policy Group Team

The Policy Group Approach

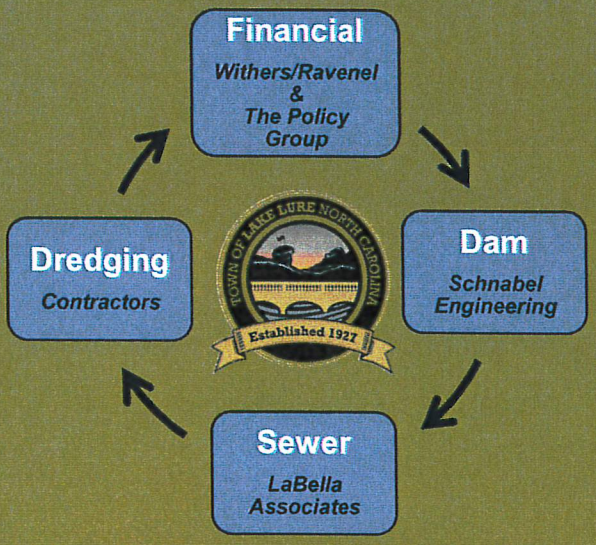
The Town of Lake Lure

Steve Metcalf, President

The Policy Group
PUBLIC POLICY AVOCATES

John Metcalf, Principal

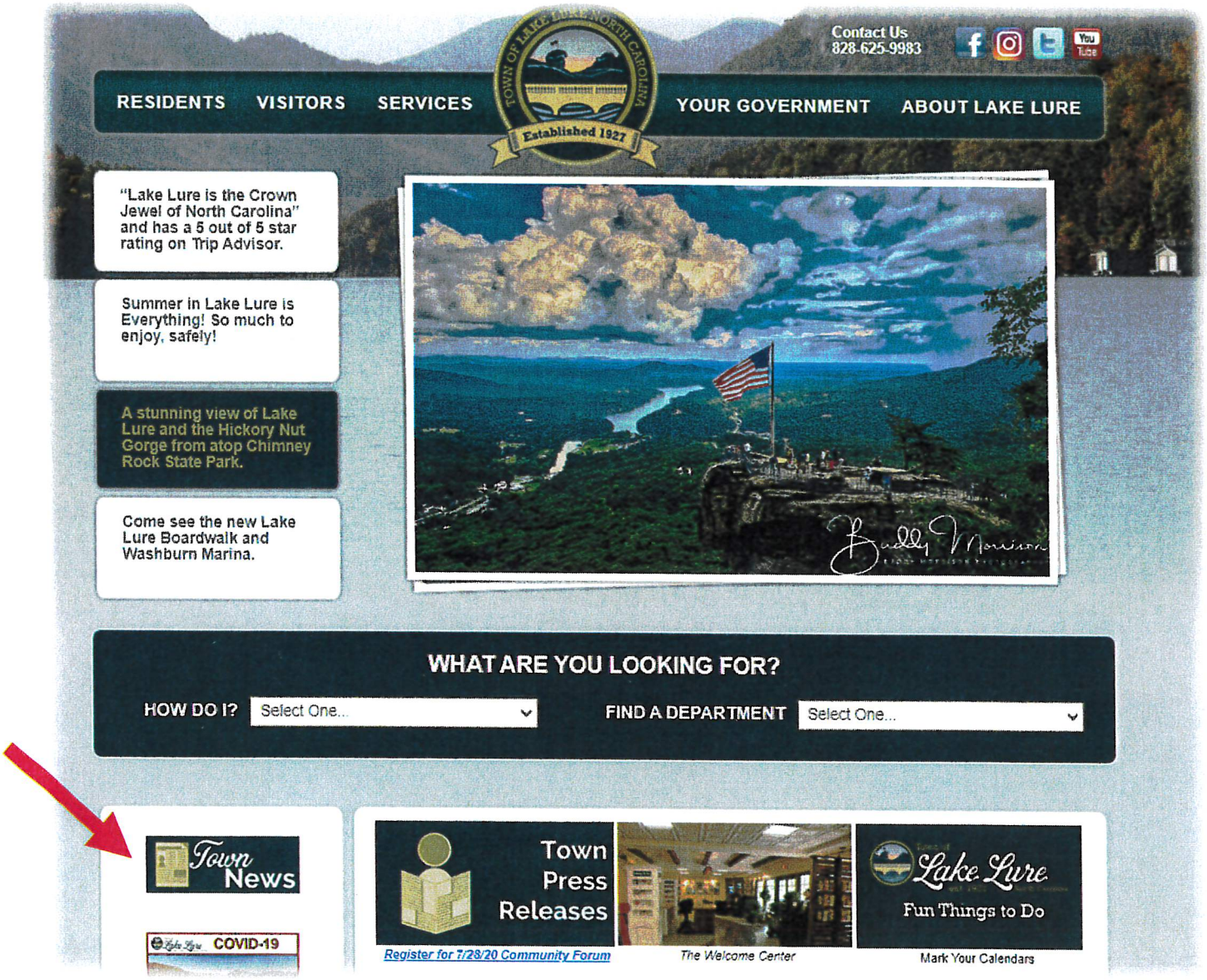
Town of Lake Lure's Multiple Priority Infrastructure Projects



Holistic Long-Term Approach

Be sure to follow daily "Town News" on the Town of Lake Lure Website

www.townoflakelure.com



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Communitcations@townoflakelure.com

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