GREEN TOWSON ALLIANCE
WHITE PAPER ON SEWERS
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IS RAW SEWAGE CONTAMINATING OUR NEIGHBORHOOD STREAMS?

ANALYISIS OF THE JONES FALLS SEWERSHED

ADEQUATE PUBLIC SEWER TASK FORCE OF THE GREEN TOWSON ALLIANCE:

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JONES FALLS SEWER SYSTEM INVESTIGATION AND REPORT

It is shocking that in the year 2017, human waste is discharged into open waters. The Green Towson Alliance (GTA) believes the public has a right to know that continuing problems with the Baltimore County sanitary sewer system are probably contributing to dangerous bacteria in Lake Roland and the streams and waterways that flow into it.

This paper is the result of 15 months of inquiries and analysis of information provided by the County and direct observations by individuals with expertise in various professional disciplines related to this topic. GTA welcomes additional information that might alter our analysis and disprove our findings. To date, the generalized types of responses GTA has received to questions generated by our analysis do not constitute proof, or provide assurance, that all is well.

1. The Adequate Public Sewer Task Force of the Green Towson Alliance:

The purpose of this task force is to protect water quality and public health by promoting the integrity and adequacy of the sanitary sewer systems that serve the Towson area. It seeks transparency by regulators and responsible officials to assure that the sewerage systems are properly planned, maintained, and operated in a manner that meets the requirements of governing laws and regulations.

2. Introduction:

In the summer of 2016, after hearing reports about raw sewage overflows in Towson Run, GTA members with knowledge and experience in water resources, infrastructure planning, construction, and quantitative research walked the route of the Towson Run sewer line. Probable raw sewage overflow locations and fresh survey stakes were observed and documented in some locations. This led to inquiries about whether the County had plans to accommodate increased flows from a growing downtown Towson and Towson University. GTA learned that a relief sewer for Towson Run was planned. GTA then questioned how increased sewage flows from new development would or could be handled further downstream through the Lake Roland interceptor and into the City, and how well the County was addressing the infiltration and inflow (leaky pipes and illegal connections) that contribute to overloading the sewer system.[1]

As part of their investigation the GTA reviewed local, state and federal laws and regulations including a Consent Decree meant to clean-up local waterways and the 2014 and 2017 Baltimore County Water Supply and Sewerage Plan Triennial Reviews.[2] This investigation and report describes the problems and issues we identified and the Appendices provide more detailed information.

Our requests resulting from the investigation are:

A. EPA and MDE should undertake an open, transparent review of Baltimore County's progress in complying with the 2005 Consent Decree.
B. The County should provide all of the information we have requested as listed on Page 44 of Appendix I. This information includes the current and projected sewerage facility conditions, flows, projects, and needs in the Jones Falls Sewershed.

[1] see Appendix D Scope of the Investigation and Appendix E Sources
[2] see Appendix C Policy Overview

C. The County should not adopt the Triennial Review of the Baltimore County Water Supply and Sewerage Plan until it is fully compliant with the requirements of its governing law and regulations.
D. The County should report water quality readings after all major rain storms, and post public health warnings around Lake Roland when warranted.
E. Instead of the current practice of engaging in case-by-case negotiations, the County should develop and implement an equitable and consistent cost sharing formula for development projects that will add to flows and/or require new capacity.

3. <u>Background:</u>

In 2002 Baltimore City and in 2005 Baltimore County entered into a Consent Decree with the Environmental Protection Agency (EPA), the Maryland Department of the Environment (MDE), and the federal court to address violations of federal and state water quality laws emanating from problems with the regional sewerage collections system. Both were ordered to take all measures necessary to comply with these laws, meet deadlines, and spend billions of dollars to eliminate all sanitary sewer overflows (SSOs) into regulated water bodies.

Overflows result in raw sewage being discharged into water bodies including Chesapeake Bay. They may be caused by leaks from old sewer lines, groundwater seeping into compromised sewer pipes, stormwater entering the sanitary lines from leaky manholes, discharges from manholes by overloaded sewer lines that back up, and illegal connections from things such as roof drains and sump pumps. There are currently significant deliberate raw sewage discharges (structured overflows) in the City to prevent backups into basements. These are expected to continue until 2022, when problems at the Back River Wastewater Treatment Plant have been resolved. All of these sources of non-sewage flows commonly result from increased flows in sanitary sewer lines after significant rain events. Collectively, all extraneous contributions of flows into pipes are called "infiltration and inflow", or I&I.[3] The Consent Decree requires the County to reduce I&I and seek to identify and eliminate illegal storm water discharges (that are likely to cause overflows).

Existing overflows can also be increased if new development is approved that adds more sewage to lines that are already operating at or near their capacity.

The Baltimore City Consent Decree was updated in June 2016. Since the City and County provide nearly equal flows into a unitary regional sewerage system, we believe, after the passage of 12 years, that it is timely and appropriate for a transparent review of the Baltimore County Consent Decree.

Based on analysis of data provided by Baltimore County's Department of Public Works (DPW), the sewer work group identified sections of sewer lines where flows currently exceed capacity, particularly during and after significant rain events.[4] Although DPW provided the data underlying our analysis, GTA has not been able to obtain additional information important to further our work. More recently DPW told GTA the Office of Law would handle such requests because the questions related to the Consent Decree might raise future legal issues. Even though a representative of the Office of Law thought all information requested

[3] see Appendix B Sanitary Sewer Overflow Components
[4] see Page 33 Appendix F Infiltration and Inflow Table

had been provided, he agreed to consider a written request for the information GTA felt had not received.[5]

GTA also shared their analysis and findings with Baltimore County Council members representing Districts 2 and 5, both of which are served in part by lines leading to the Lake Roland Interceptor. On their staff's recommendation GTA sent their findings to MDE, EPA and the federal court office, which oversees the Consent Decree for their investigation and evaluation. GTA learned that those agencies have been discussing our concerns and have requested information from the County, but GTA has not been privy to the details of those discussions or any evaluations. Just prior to this writing, EPA provided correspondence stating that they found no violations of the Consent Decree from their perspective. They provided no information as to how they reached that finding, but said it was appropriate that GTA is raising issues with local and state entities.

4. Summary of Findings:[6]

A. Towson Run Sewer

DPW is planning to install a Towson Run relief sewer to accommodate increased flows from Towson Row, Towson University, and other new development. GTA has requested, but not received, studies to support the need for this new line and to describe the environmental impacts of its construction. Almost the entire Towson Run interceptor is about or under 50% of capacity in dry weather. If this is the case, why is a relief line needed, especially if I&I are properly addressed? Construction will surely disrupt traffic, result in removal of many trees, damage wetlands and floodplains,[7] and require access to private properties. The only meaningful information that has been shared with us to explain why a relief sewer is needed are DPW wet weather pipe capacity tables that do not seem to be consistently applied downstream in Lake Roland and the Upper Jones Falls.[8] Based on what we have been able to learn, it does not add up.[9]

As stated earlier, GTA plans to follow up with the County Office of Law in the near future with the following questions.

- What are the flow projections that justify a relief sewer for the Towson Run sewershed based on zoning, population growth, and development plans?
- What are the basic parameters of the sewer line, i.e. size, capacity, and exact route?
- What is the construction schedule?
- What are the details of post construction restoration of Towson run and its riparian areas?
- How will additional flows be accommodated in wet weather downstream?
- What is the cost of I&I reduction versus the capital and environmental costs of installing an entirely new sewer line?
- How can we get a copy of the Jones Falls SRRR Plan that is required by the Consent Decree, and which the Triennial Review states was accepted by the EPA on December 9, 2013, and needs to be implemented by September 6, 2019?

[5] see page 44 Appendix I for the list of materials requested but not received to date
[6] see Appendix A for an overview and schematic map of the Jones Falls Sewershed System
[7] see Appendix G Environmental Impact and Baltimore City's Stoney Run Model
[8] see page 41 Appendix I Transparency and Compliance – 2. Design Models
[9] see Appendix F Is the wet weather capacity problem in the Jones Falls Sewershed being addressed appropriately?

The Triennial Review should explain the need for, describe, and map the relief sewer if it is actually a planned capital project.

B. Upper Jones Falls Sewer

In addition to the planned Towson Run relief sewer, GTA learned that other relief sewers are planned for the Upper Jones Falls to remedy certain bottlenecks that need to be accommodated from current flows plus additional flows from proposed development. Since the Upper Jones Falls Sewer flows into the Lake Roland interceptor and then downstream into Jones Falls in the city, this portends still higher flows into those pipes. Our analysis of County data indicates numerous overloaded pipe sections along the Upper Jones Falls interceptor. As with the Towson Run relief sewer, no information is presented in the Triennial Review, or has been otherwise provided to describe or explain the following:

- How will existing and future flows be accommodated?
- How are the Upper Jones Falls pipe sections that surcharge in wet weather being addressed?
- What other bottlenecks may need to be addressed?
- Are there more cost effective alternatives to sewer line construction such as I&I reduction to handle future increased flows?

C. Lake Roland Interceptor and Jones Falls in the City

Based on County supplied information, three existing sewer lines, Towson Run, Roland Run, and Upper Jones Falls join at the northern end of Lake Roland and flow through a 60-year-old, 3000 foot, 42 inch sewer line directly under the lake.[10] Flows from that pipe continue into the City's Jones Falls interceptor where the City routinely releases millions of gallons of raw sewage during wet weather events into Jones Falls at structured overflows. Roughly one-half of all Jones Falls sewage originates in the County.

GTA's analysis of County supplied data concluded that the Lake Roland interceptor is currently well over 100 percent of capacity during wet weather events. The GTA analysis indicates that there is significant I&I entering the system, and the pipe is overloaded to such a degree that raw sewage must be spilling out of the system somewhere or must be backing up into feeder sewer lines. Likely locations for raw sewage spills include the deficient manholes documented in a field study conducted by our investigative team.[11]

Water samples from the lake show the presence of enterococcal fecal contamination, which is a clear indication of human waste.[12] This is evidence that, at the least, raw sewage discharges are occurring in areas around the lake.

The Triennial Review should discuss and document how excess flows are being addressed. If there is data that supports DPW's position that there is adequate capacity in the Lake Roland interceptor and other pipe sections in its sewershed it has not been shared with GTA. Our questions remain:

[10] see map on page 13 Appendix A Overview of the Jones Falls Sewershed System

[11] see pages 24-31 Appendix E Sources 4. Observations Made of Sanitary Sewer Interceptor Manhole Stacks in Lake Roland Park and Adjacent Upstream Structures.

[12] see Appendix H

- Explain why data showing capacity problems in the Lake Roland Interceptor will not cause or contribute to Sanitary Sewer Overflows (SSOs) from the collection system during the specified minimum full range of storm events?
- What quantified maximum flow can these pipes convey without causing or contributing to SSOs?
- What is the status of I&I reduction and elimination of illegal connections?

The County stated at the July Planning Board hearing that all is well with the Lake Roland interceptor. This is not consistent with GTA's analysis of the data provided by DPW, which indicates some sections are surcharged in wet weather.[13] The simple math of the three, and soon four lines that will feed into the Lake Roland interceptor should at least raise capacity questions.

D. County Water Supply and Sewerage Plan Update - 2017 Triennial Review

The Triennial Review is required to address the specific issues discussed in the previous sections. It falls far short of meeting many of the detailed requirements of the state law and regulations that govern it. The plan provides no information that reflects the flows and capacity issues that are the subject of this paper. It lacks the maps and tables that should show existing or projected problem areas or capacity deficiencies anywhere in the County including the areas we have focused on: Towson Run, Roland Run, Lower Jones Falls, and the Lake Roland interceptor. The plan is required to describe and justify major new facilities based on specific land use, development, population growth, flow, and capacity information and on analysis of the potential of remediating I&I as an alternative means of capturing capacity.

The fact that capacity limitations exist or may be projected to exist can be inferred from the fact that relief sewers for Towson Run and Lower Jones Falls are listed as capital projects. However the required detailed information to explain the need for these new lines is not in the Triennial Review. The plan contains no information to describe how existing and increased flows in three sewershed interceptors can be accommodated into the one 60-year-old, 42" interceptor under Lake Roland.

The Countywide scale of land use, demographic, and physical maps and tabular information are helpful. However, they are not a substitute for smaller sewershed scale maps and data that the law also requires to support a capital program that must show specific projects, costs, funding sources, and schedules. The Triennial Review refers the annual County Capital Improvement Program (CIP) for specifics, but the information in the CIP is no more useful or detailed than what is published in the Triennial Review.

A powerful paragraph in the state law mandates County Water and Sewerage Plans. It mandates unequivocally that new development that is consistent with County Comprehensive Plans may not be permitted unless there is adequate water, sewer and solid waste capacity to support it. Failure to meet this mandate has the potential to stop new development in its tracks.[14]

Based on this section of state law, GTA seeks to understand Baltimore County's process for reviewing and approving development and construction permits, and how determinations are made about adequacy that take into account all existing and future development potential.

[13] see Appendix F Is the wet weather capacity problem in the Jones Falls Sewershed being addressed appropriately?
[14] see Appendix C Policy Overview p. 16 and Appendix I Transparency and Compliance

How can permits be issued for any development in the sewersheds merging into the Lake Roland interceptor that will increase flows in already overloaded sewerage facilities both in the County and downstream in Baltimore City?

Much of the information that is required in the Triennial Review also is required in various ways to address the mandates of the 2005 Consent Decree and obligations of the 1974 City County agreement.[15] The Triennial Review is the document that is required to pull all the relevant information together to assure the sound operation and maintenance of a system that is adequate to meet needs without violating federal and state water quality and public health laws and regulations.

E. Equity

At this writing GTA has not reviewed the County adequate public facilities ordinance and practices or whether any impact fees are relevant to sewerage facilities. GTA supports the principle that new developments or new growth of whatever type should pay a fair share of the costs they impose on public facilities and services and hold existing residents and businesses harmless from those costs.

For example: how will the Towson Run relief sewer will be paid for; or who among the new or expanding users will contribute to the cost of its construction? If the Towson Run relief sewer or other downstream facilities prove to be necessitated to accommodate increased flows from large new development or institutions such as Towson University, it is only fair that these users pay a fair share of the cost for the public infrastructure improvements they require. There is precedent for this in the Osler-Towsontown intersection improvements with costs being shared by Towson University, St. Joseph University of Maryland Hospital, and the County.

5. Recommendations:

In the introduction to this paper GTA requested specific actions. Additionally, the GTA calls upon the County to hasten the completion of its obligations to eliminate sanitary sewer overflows from the Jones Falls Sewershed and address the compromised pipes that appear to be contributing so much to these problems, including the old and deficient Lake Roland interceptor pipe before it is burdened by additional populations from Towson Row and Towson University.

There is a very high taxpayer burden for upgrading the aging County sewer system while at the same time funding rapid growth of dense development in the Towson Area. This burden should be fully revealed to taxpayers, rather than buried in highly summarized figures. The County needs to do a much better job of disclosing its cost analysis, separating system repairs and rehabilitation from the cost of new capacity needs and identifying major sources of sewage flows from new and proposed development. The cost of adding new capacity (e.g. the planned relief sewers) should follow codes and laws so that developers and large institutions contribute to additional infrastructure requirements. This should be transparent to the voters and other stakeholders.

As a result of our inquiry, the GTA calls upon Baltimore County to produce a more coherent plan for adequately managing human waste generated by its growth plans that flows into the Jones Falls Sewershed, now and in the 3 and 10 year planning horizons. The County should

[15] See Appendix I Table A page 43 and 44

then be diligent in adhering to its commitment to the Plan, once approved, and provide sufficient information for stakeholders to understand and see important underlying assumptions, goals and performance accomplishment metrics. Specifically, we suggest the existing plan needs to be upgraded to include many improvements for better transparency, integrity, costing, and equity.[16]

6. <u>Conclusion:</u>

The GTA has proceeded from following a streambed on foot to observe sewage overflow points, to spending months of our technical talent attempting to penetrate mountains of data with limited useful information and interpretation for our purposes. We have interviewed County Public Works employees repeatedly and extensively, and remain unsatisfied with answers that evolved during our inquiry from what appeared to be tunnel vision, to evasiveness, to complete lack of responses, to the Office of Law acting as go-between. We have persevered at our own interpretation of the data aided by some very high-level, volunteer consulting talent. We leave the stakeholders of the County with our conclusions.

- Baltimore County DPW information requested by GTA reveals I&I and long-term capacity/peak flow management issues in Jones Falls sewershed in Lake Roland and tributary interceptors that are not disclosed in various regulatory reports.
- There does not seem to be documented auditable analytical support for required evaluations in Consent Decree, Triennial Review and other legal requirements. Reviews of these legal documents confirm GTA's expectation that such support should exist and be readily available in DPW files.
- There appears to be limited reporting by Baltimore County about water quality after intense rainstorms, and posting about water safety warnings for the public.
- The taxpayers may well be paying for the highest cost solutions, with zero contribution from the obvious beneficiaries, without even factoring in the environmental costs.

Full details on the evaluations and decisions on the planned relief sewers should be disclosed, as well as the evaluations and decisions to not address other problematic pipes in Lake Roland Park. The intentions for remedying the Lake Roland Interceptor, and for keeping the Lake waters clean and safe both now and in the future should be disclosed. The County Water Supply and Sewerage Plan needs to contain more detailed information for transparency and better decision-making. We offer our inquiry, results, and thoughts for improvement for stakeholder education. With informed voters and taxpayers, our hope is that future projects will have more thoughtful and publicly available evaluations resulting in the most cost effective and environmentally sensitive solutions.

[16] see appendix J Transparency and Compliance - Improvements to 2017 and Future Triennial Plans

Index of Acronyms

Acronym	Term
APFO	Adequate Public Facilities Ordinances
BCDPH	Baltimore County Department of Public Health
CIP	Capital Improvement Program
DOJ	Department of Justice (Federal)
DPW	Department of Public Works (Baltimore Co.)
EPA	Environmental Protection Agency (Federal)
GTA	Green Towson Alliance
I&I	Infiltration and Inflow
ISD	Illegal Stormwater Discharges
LRI	Lake Roland Interceptor
MDE	Maryland Department of the Environment
PUD	Planned Unit Development
RRLRAIA	Ruxton-Riderwood-Lake Roland Area Improvement Association
RRR	Repair, Replacement and Rehabilitation plan
SSES	Sanitary Sewer Evaluation Survey
SRRR	Sewer Repair, Replacement and Rehabilitation Plan
SSO	Sanitary Sewer Overflow
TR	Triennial Review
TRRS	Towson Run Relief Sewer project
URDL	Urban Rural Demarcation Line (Baltimore Co.)
W&S	Water and Sewer

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[17] Thank you to Elizabeth Miller and Patty Mochel for their assistance with the appendices

APPENDIX A – OVERVIEW OF THE JONES FALLS SEWERSHED SYSTEM

1. Existing Sewers

Baltimore County has twenty-two sewersheds. The Towson Run sewer collects sewage from Towson south of Joppa Road and west of York along Towson Run down Towsontown Boulevard, and under the Charles Street culvert. Sewage flows in a 21" pipe from Charles Street becoming 24" between Malvern Avenue and just upstream from Bellona before flowing into the same structure at the head of Lake Roland. Recently the County placed a parallel 36" pipe under Bellona Avenue, the light rail track and water to the junction box/manhole 6888 at the head of Lake Roland for future use. These pipes are joined by a 42" sewer line from the north that follows Roland Run, and a 30" sewer line from the west that follows (upper) Jones Falls.

These four sewer lines converge at junction box/manhole 6888 in Lake Roland Park and then flow in a 42" sewer line known as the Lake Roland Interceptor (LRI) for almost 3,000 feet under Lake Roland to manhole 6887 just southwest of Lake Roland. Further downstream, they are joined by other sewer lines as they follow (lower) Jones Falls and cross into Baltimore City.

Our investigation found that three overloaded pipes, a 42", a 30" and a 24" flow into one 42" pipe, the LRI, that according to DPW construction drawings, is over six decades old. The LRI was built before Towsontown Boulevard and Osler Drive existed, and more than a decade before GBMC and St. Joseph's medical centers and campuses opened their doors.

At that time, Towson State Teacher's College (now Towson University) enrolled under 1,000 students, and Towson was a sleepy small County seat compared to the urban center it is today, with substantial additional developments being planned. The LRI was constructed before a lot of existing and new development were connected to the sanitary sewer pipes that flow along and beneath all three stream valleys.

There are historic and ongoing problems from these points south, where untreated sewage can be released by the City and spill into Jones Falls and the Inner Harbor, causing significant public health and environmental violations. Ultimately, sewage that doesn't escape the system is pumped east to the Back River sewage treatment facility.

2. Proposed Towson Run Relief Sewer

The GTA initiated this investigation after learning that Baltimore County was preparing plans for a parallel sewer line from Washington Avenue in Towson, along Towson Run and Towsontown Boulevard, across Charles Street to the Bellona Avenue culvert. The project is called the Towson Run Relief Sewer (TRRS). Construction of Phase 1 of the project has begun on Towsontown Blvd. in conjunction with intersection improvements at Osler Drive.

County sewer officials have stated that the TRRS is necessary to accommodate growth from Towson Row, Towson University and other new development in Towson, and to address existing infrastructure issues in the Towson Run sewer system causing groundwater and storm water I&I. According to officials in the DPW sewers division, this project will involve installation of at least a new 21" sewer line parallel to the existing sewer line, and the construction of two temporary access roads at Charles and at Bellona for heavy equipment.

Towson University's Master Plan projects an addition of 3,000 beds by 2029.

TOWSON UNIVERSITY GROWTH, 2009-2018 (PROJECTED)

Category	*Historical* Fall 2009	*Current* Fall 2014	*Projected* Fall 2024	*Projected* Fall 2029
Headcount Enrollment - Institution [1]	21,177	22,285	25,034	27,193
Headcount Enrollment - Towson Campus	19,500	20,459	22,982	25,000
FTE Undergrad Enrollment - Institution [1]	15,986	17,188	20,432	20,974
FTE Undergrad Enrollment - Towson Campus	15,533	16,320	19,400	19,825
On-Campus Student Housing	4,385	4,972	7,760	7,930
On-Campus + Adjacent Student Housing [2]	5,495	6,082	8,870	9,040
Parking Spaces	7,279	7,776	9,290	9,490

Notes:
[1] Institution includes: main Towson campus, satellite campuses, and online education
[2] TU Adjacent Student Housing includes: University Village (585 beds) and Towson Place (525 beds)

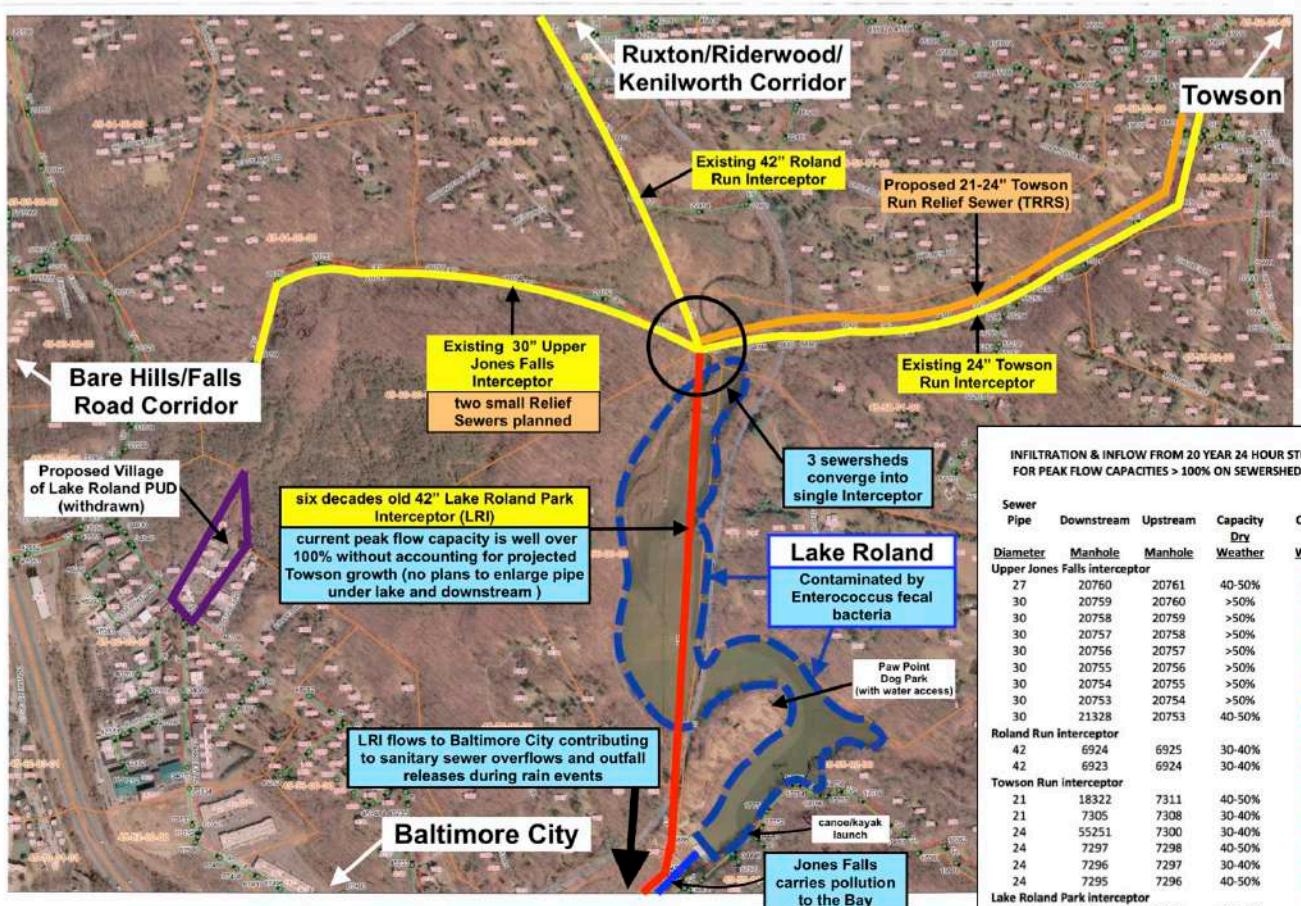
source: *http://www.towson.edu/facilities/masterplan/documents/execsummarytufinal.pdf*

A May 17, 2017 letter to residents who live along the impacted section of Towson Run asks them to grant "irrevocable access" in the form of a right of entry agreement from the Baltimore County Real Estate Compliance Department. The letter called this project the "Jones Falls Structural Rehabilitation Project". Per the letter, "The purpose of the project is to repair and upgrade the existing infrastructure." Upon further inquiry, a resident was told the County would be lining the existing sewer on their property. They were informed that the TRRS is a separate capacity project, and that any questions about the TRRS had to be answered by someone else in DPW. One resident subsequently requested the right of entry agreement be limited to only rehabilitation and would not permit access for a relief sewer. Other residents have refused to sign agreements until the county provides more information about the relief sewer. More recently, DPW has informed GTA that inquiries about the TRRS would be addressed by the County Office of Law. Many of our questions about this project have remained unanswered, even though initial construction has commenced.

Utility poles are braced in advance of deep trench work for Towson Run Relief Sewer at the intersection of Osler and TTBlvd. 6/07/2017

3. **<u>Upper Jones Falls Sewer and Proposed Upper Jones Falls Relief Sewer</u>**

The Upper Jones Falls Interceptor enters the system from the west from manhole 20761 to the junction box at manhole 6888, then goes under Lake Roland and through Lake Roland Park into the city. In a preliminary response to a PUD application, DPW stated, "the downstream sewer system does not have capacity to convey the flow from this proposed relief sewer." A relief sewer is planned to increase capacity in the Upper Jones Falls Sewershed.



INFILTRATION & INFLOW FROM 20 YEAR 24 HOUR STORMS
FOR PEAK FLOW CAPACITIES > 100% ON SEWERSHED MAP

Sewer Pipe Diameter	Downstream Manhole	Upstream Manhole	Capacity Dry Weather	Capacity Wet Weather
Upper Jones Falls interceptor				
27	20760	20761	40-50%	111%
30	20759	20760	>50%	172%
30	20758	20759	>50%	179%
30	20757	20758	>50%	164%
30	20756	20757	>50%	197%
30	20755	20756	>50%	170%
30	20754	20755	>50%	114%
30	20753	20754	>50%	589%
30	21328	20753	40-50%	119%
Roland Run interceptor				
42	6924	6925	30-40%	116%
42	6923	6924	30-40%	119%
Towson Run interceptor				
21	18322	7311	40-50%	108%
21	7305	7308	30-40%	107%
24	55251	7300	30-40%	113%
24	7297	7298	40-50%	146%
24	7296	7297	30-40%	109%
24	7295	7296	40-50%	155%
Lake Roland Park interceptor				
42	6887	6888	40-50%	144%
42	6886	6887	40-50%	156%

data source: Baltimore County dry and 20/24 wet weather pipe capacities analyses

<u>Schematic Jones Falls Sewershed Map</u>

no scale. Locations are Approximate
source map Baltimore County sewer interconnects map
© Green Towson Alliance, 2017 E. Miller

APPENDIX B – SANITARY SEWER OVERFLOW (SSO) COMPONENTS

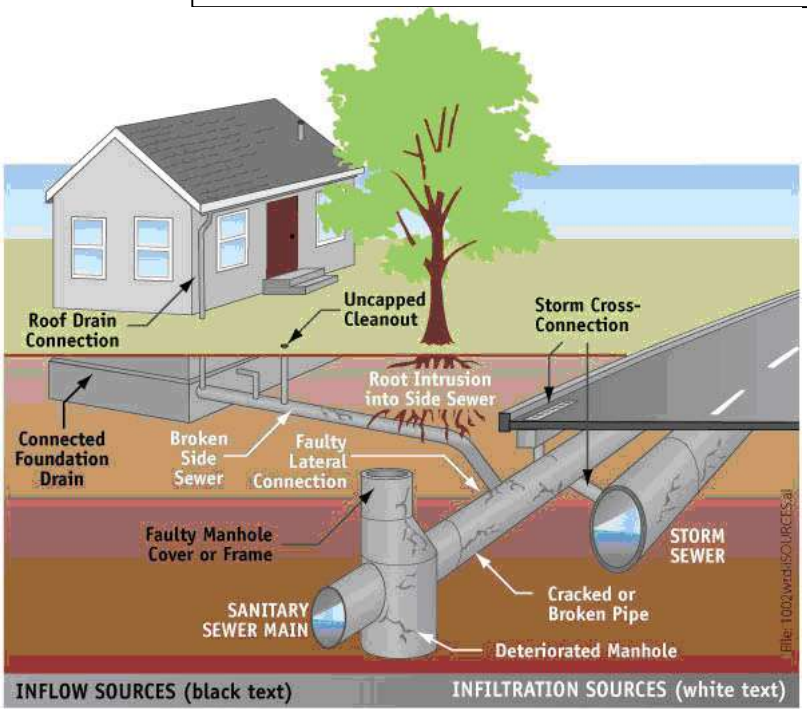
The 2005 Consent Decree between Baltimore County and EPA/MDE define SSO as any spill, releases or discharges, including any addition, introduction, leaking, spilling or emitting of pollutants in water, or in a location where a pollutant is likely to pollute water.

1. Infiltration and Inflow

When wastewater exits a house through its plumbing system, it enters the sewer system via a house connection to a lateral sewer outside the house, which in turn joins neighborhood sewer collectors. The collectors then flow into larger sewers called interceptors, which ultimately convey wastewater to treatment plants. The Jones Falls Sewer System, which includes Towson Run Sewer, flows by gravity from higher elevations to lower elevations following their namesake stream valleys.

The scourges of sanitary sewer systems are infiltration and inflow (I&I), which cause dilution and decreases the efficiency of treatment, which may cause sewage volumes to exceed design capacity. This directly increases costs and decreases effectiveness of sewage treatment, and can cause sewer backups and overflows. The EPA defines the term infiltration/inflow as combined contributions from both. Here are the differences between infiltration and inflow from Wikipedia:

> "Water entering sanitary sewers from inappropriate connections is called ***inflow***. Typical sources include sump pumps, roof drains, cellar drains, and yard drains where urban features prevent surface runoff, and storm drains are not conveniently accessible or identifiable. Inflow tends to peak during precipitation events, and causes greater flow variation than infiltration ..."



source: www.kingcounty.gov

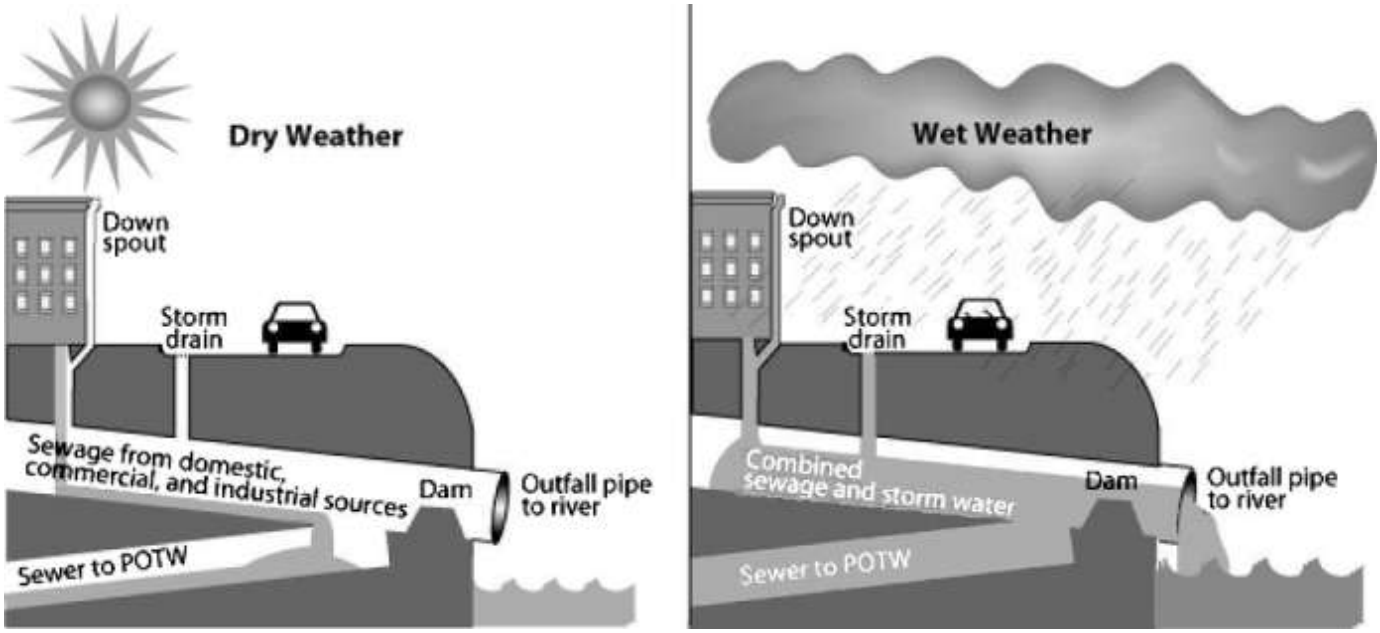
> "Groundwater entering sanitary sewers through defective pipe joints and broken pipes is called ***infiltration***. Pipes may leak because of careless installation; they may also be damaged after installation by differential ground movement, heavy vehicle traffic on roadways above the sewer, careless construction practices in nearby trenches, or degradation of the sewer pipe materials. In general, volume of leakage will increase over time. Damaged and broken sewer cleanouts are a major cause of infiltration into municipal sewer systems."

Another source of I&I are faulty manholes that are not watertight and are not raised above the flood plain.

Significant infiltration indicates the system is not sealed watertight. When components are not watertight, exfiltration (a leaky sewer) likely occurs if the sewer system is under higher pressure than external groundwater forces, draining raw sewage into surrounding soils, streambeds and the gravel bedding used to construct the whole system. Escaped sewage would not necessarily surface and become apparent if the leaks and groundwater are below the surface. When surcharged, the same hydraulic force is exerted equally within the interior of all pipe connected to the manhole, and exfiltration could be expected everywhere pipe and connections to structures were not watertight.

2. <u>Structured Overflows and Outfalls</u>

Early combined sewer systems collected both sanitary and storm sewage into surface waterways without treatment. As cities built sewage treatment plants, they were built to treat only the volume of sewage flowing during dry weather. When it rained, relief structures, called overflows or outfalls, allowed excess volumes to overflow into waterways. The Clean Water Act of 2000 requires municipalities to comply with EPA policy that would eliminate or reduce sewer overflows and outfalls and related pollution problems.



Outfall in Dry versus Wet Weather *source: https://en.wikipedia.org/wiki/Combined_sewer*

APPENDIX C - Policy Overview

1. State and Federal Regulations

Baltimore County is subject to State and Federal water pollution laws and regulations, the 1974 Sewer Agreement between Baltimore County and Baltimore City, the 2005 Baltimore County Consent Decree and County Water and Sewerage Plan Laws and Regulations. The essence of all these laws, regulations and agreements is:

- Federal and state water quality standards may not be violated.
- Wastewater conveyance and treatment facilities capacities may not be exceeded.
- Extraneous flows (I&I and ISD's) are not permitted in sanitary sewer systems (1974 Agreement and 2005 Consent Decree).
- Baltimore County and Baltimore City are contractually obligated to annually notify each other of flow projections for every point of entry at jurisdictional boundaries in the system, and the originating jurisdiction must limit connections and flows that cannot be accommodated in the other jurisdiction. (1974 Agreement).
- New development may not be permitted unless there is adequate capacity to support it, as stated in §9-512 of the County Water and Sewerage Plan law:

  "A State or local authority may not issue a building permit unless:
  (i) The water supply system, sewerage system, or solid waste acceptance facility is adequate to serve the proposed construction, taking into account all existing and approved developments in the service area;
  (ii) Any water supply system, sewerage system, or solid waste acceptance facility described in the application will not overload any present facility for conveying, pumping, storing, or treating water, sewage, or solid waste".

2. Consent Decree

Both the City (2002, 2016) and County (2005) are under EPA and MDE Consent Decrees to stop sewage discharges, and their Jones Falls sanitary sewer systems are directly tied together. The 2005 Consent Decree alleged that the County continued to operate its sanitary sewer system in violation of the Clean Water Act and Maryland water pollution control laws by discharging untreated sewage into waterways. The settlement requires Baltimore County to take all measures necessary to comply with the Consent Decree, with the goal of eliminating all SSOs. The County is required to reduce I&I, seek to identify and eliminate illegal storm water discharges, including privately owned conduits to increase system capacity.

Consent Decrees require collection system inspections, in order to identify causes or potential causes of SSO's and documentation of all deficiencies and corrective actions taken or planned. The documentation must describe prioritizations of what criteria was used in decisions to correct or not to correct a deficiency. The County also must identify all modeled collection system components that cause or

As recently as 4/6/2017, 3.1 million gallons of rain water combined with raw sewage was released from four structured overflows into the Jones Falls following heavy rains infiltrating and overwhelming the sewer mains in Baltimore City. Structured sewer outfalls were designed into Baltimore's sewer system more than 100 years ago, but are being eliminated as part of the City's Consent Decree.
source:
http://publicworks.baltimorecity.gov/news/press-releases/2017-04-07sewer-overflow-reports

contribute to flow restrictions or that have the potential to cause or contribute to overflows, and quantify maximum flows that can be handled without an SSO.

Specifically, the 2005 Consent Decree requires that:

- Baltimore County shall complete an I&I Evaluation and a Long-Term Capacity/Peak Flow Management Evaluation for each sewer shed (page 26)
- I&I Evaluation shall include identification of sources, methods for reducing I&I into Collection System, and determination and prediction of effectiveness of capital projects and/or corrective actions (page 27)
- Baltimore County shall use specified data and information to evaluate whether construction projects will ensure adequate long-term transmission capacity in the Collection System (page 27)
- Baltimore County shall use specified information to assess existing and long-term capacity to evaluate the ability of the Collection System to transmit peak flows experienced by and predicted for the Collection System, and to identify appropriate measures to address capacity issues with the goal of eliminating capacity-related SSOs. (page 28)
- Peak flows shall take into account variables including, but not limited to: the average age of the gravity sewer system, soil type and porosity, maximum minimum and average yearly groundwater elevations, proximity to water bodies, amount of drainage area, service area size, land use, historic I&I data, Collection System construction materials, and year 2025 predicted population and land uses (page 28)
- Baltimore County shall determine peak flows for, at a minimum, 2,10, and 20-year/24-hour storm events (page 28)
- Future conditions shall be based on reasonable population projections for year 2025. Baltimore County shall include effects of completion of any capital projects required and proposed pursuant to each SRRR Plan (pages 28/29)
- Baltimore County shall seek to identify and, upon identification, shall eliminate illegal stormwater discharges likely to cause or contribute to an SSO. Pages 42/43
- In evaluating required and proposed capital improvements projects, Baltimore County shall account for Collection System's existing and modeled capacity, the estimated population and wastewater flow rates for the year 2025, and estimated sewer deterioration rates, and shall use results of that evaluation to :

    - Identify any Modeled Components that restrict flow of wastewater through the Collection System that cause or contribute, or are likely to cause or contribute, to SSOs from the Collection System
    - Quantify the maximum flow that any Modeled Component identified can convey without causing or contributing to an SSO
    - Identify all Modeled Components that cannot manage peak flows during a full range of storm events without causing or contributing to an SSO
    - Identify the improvements to the Collection System necessary to ensure adequate long-term capacity consistent with SSES Handbook during a full range of storm events
    - Improvements to assure adequate capacity shall include expansion and/or replacement of Modeled Components, including ... reduction of I&I, and installation of larger replacement sewers or relief sewers. (pages 29/30)
    - Baltimore County shall prepare a SRRR Plan for each Sewershed that describes deficiencies identified through the Collection System and provides for the performance of any repair, replacement, rehabilitation or other corrective action necessary to address those deficiencies (page 31)
    - See detailed criteria for SRRR Plans, priorities and decision-making (pages 32-34) that includes a description of the smoke testing and dye testing activities performed in the Sewershed (for identifying illegal discharges), and quantification of rates of I&I, portions of Sewershed impacted by I&I, and identified sources of I&I located in Sewershed.

3. <u>Adequate Public Facilities</u>

A review of adequate public facilities ordinances (APFOs) reports from The Maryland Department of Planning and APFO Workgroup of the Maryland Sustainable Growth Commission, found many suggestions that represent best practices and common sense. They include:

- Adequate public facilities should be available for new growth, and growth should be directed to suitable areas where facilities are adequate.
- Development approvals should be tied to specifically defined public facility standards.
- APFOs are designed to slow or delay development until adequate service levels are in place or reasonably assured.
- "… if the roads are too congested … if the sewer pipes or treatment plant are full, … then development cannot be approved until the problem is corrected".
- Land use and facility planning are linked, interdependent, and synchronized with the zoning process. Necessary infrastructure must exist prior to development approval.
- Sewer capacity design should be viewed as a "weak link" process – if any component is undersized, then development will be constrained until the component is properly sized.
- The developer is responsible for the costs of correcting capacity constraints everywhere except for corrections needed at the treatment plant.

The pending Towson Row Development includes:

- *1.2 million square feet of mixed-use development*
- *Over 100,000 square feet of restaurants and retail space, including a grocer.*
- *150,000 square feet office tower*
- *300 premium student housing units*
- *250 luxury high-rise apartments*
- *and a 220 room hotel*

source: http://towsonflyer.com/2017/06/22/towson-row-wins-approval-move-forward-revised-plan/

4. The 1974 City-County Agreement

The county is contractually required to share key data with the City, data that has not been provided to our investigative team but is required by law and regulations in the Triennial Review. It also contractually prohibits I&I.

Relevant Excerpts from the 1974 City County Agreement

ARTICLE V: INTERCONNECTIONS OF THE SEWER SYSTEM

B. The Directors of Public Works...shall transmit to their counterparts, not later than November 1 of each year projections of flows from their subdivisions to the other by point of entry [and] shall prepare a six-year Capital Improvement Program designed to accommodate flows from one system to the other together with those facilities to handle the estimated flows within his respective subdivision.

D. Not later than July 1, the Directors shall notify their counterparts of those system facilities in the officially adopted CIP and shall provide data by years on flows to be accommodated at each point of entry and capacities to be made available for the other parties flows....

E. The Director of the originating jurisdiction shall limit the number of connections and flows to those flows which the Director of the other party can be safely accommodated. (Emphasis added)

ARTICLE VI: STORM WATER, SURFACE WATER, AND OTHER MATERIALS NOT TO BE DISCHARGED INTO SANITARY SEWERS

A. Stormwater, surface water, subsurface water and other non-polluted wastes shall not be into these sanitary sewers, which drain into the jointly owned sewers of either party. (Emphasis added) No street inlet, catch basin, storm drain, rain leader, cellar drain, garage drain, or any other connection through which storm water, ground water or any other water not classified as sewage can flow shall be connected to the aforesaid sanitary sewers....

B. Such parties agree to every effort to prevent the owners of properties to the City and the Metropolitan District [County] from discharging storm water into the sanitary sewers connecting with the sewers of either party....

5. Baltimore County Water Supply and Sewerage Plan Triennial Review

Every county in Maryland must prepare a 10-year water and sewerage plan that includes the needs and plans for cities/towns within their boundaries. These plans are required to be reviewed and updated every three years and may be updated at any time. The Plan and any amendments must be adopted by the county governing body and submitted to the state Department of the Environment for approval. Properly used, administered, and enforced, this is a powerful tool which assures all parts of the planning and engineering system are working in concert to provide adequate sewer service in a timely manner to support existing and planned development without violating water quality laws. It is worth noting that the word "adequate" appears about 12 times in the law, which mandates this program.

As noted earlier, state requirements for Baltimore County's 10-year plan are the same common sense basic information and analysis that is required to comply with the 2005 Consent Decree, the City-County agreement, and to assure compliance with water quality laws.

Requirements for the Baltimore County Water Supply and Sewerage Plan Triennial Review

- The Plan must include detailed maps which show where community facilities are or will be provided, and where individual septic systems and wells may be used. The latter is generally outside of the Urban Rural Demarcation Line (URDL) as defined in the County Master Plan. The maps and tables in the Plan are required to show all major sewerage facility locations, sizes, and capacities as of the date of the update.
- This Plan is the document which must bring together all of the information to show how community systems will be planned, maintained, operated, and financed for the ensuing 10 years to assure compliance with all federal and state water quality laws and regulations. That information, as spelled out in the law and regulations should include:
  - Demographics/land use
    - Comprehensive county /community plans
    - Existing and projected population
    - Zoning at build out - population, commercial, industrial
    - Current development plans
  - Existing sewerage system: size, capacity, flows
    - Major gravity lines and force mains
    - Pumping stations
    - Treatment plants
  - Projected flows based on population growth and development plans
    - Major gravity lines and force mains
    - Pumping stations
    - Treatment plants
  - Comparison of existing systems with projected flows
    - Identify problem areas (existing or projected flows exceeding capacity)
    - Identify facility needs
    - Identify project needs for growth and formulate capital project list
  - Identify other system needs
    - Assess facility conditions
    - Identify I&I reduction needs
    - Replace/upgrade deteriorating facilities
    - Add to capital project list
- A principal "product" resulting from the compilation and analysis of all of the relevant planning and engineering information is a capital program that lists every major sewer project needed to supply adequate sewer service for existing and planned population growth and development. The law requires that projects may not be permitted that are not shown in and supported by this Plan.

APPENDIX D – SCOPE OF INVESTIGATION

GTA Investigative Team

Larry Fogelson spent 38 years at Maryland Department of Planning working on policy and land use issues related to water resources, and provision of water, wastewater and other public infrastructure.

Roger Gookin is a retired sewer contractor, past president of Utility Contractors Association of Anne Arundel County and recognized expert in the 5th and 7th Circuit Courts of MD.

Tom McCord is a retired CFO and formerly licensed Maryland CPA, with an undergraduate degree in Engineering.

1. Overarching Concerns

The GTA investigative team is concerned that Baltimore County may not be connecting dots between its development agenda, state requirements for a triennial review and basic services maps, its responsibilities for adequate public facilities, the 1974 City-County Agreement, the 2009 Lake Roland lease, and the 2005 Consent Decree with The United States of America (EPA) and the State of Maryland (MDE) to prevent violations of the Clean Water Act, Maryland water pollution control laws and other state laws.

These concerns are based on statements made to us by publics works officials which appear to be inconsistent with data they provided upon our requests; with what is required by the Consent Decree, necessary for compliance with USA and MD laws; with the goal of eliminating sanitary sewer overflows; and with our conceptions of quantitative research, basic hydraulics and premises of triennial review and adequate public facilities.

2. Areas Reviewed

The GTA's initial inquiry was about the environmental disruption of the Towson Run stream valley by the proposed TRRS and concerns that the relief sewer wasn't necessary. The scope then expanded to concerns for downstream flow being added from the TRRS to the over-capacity Lake Roland Interceptor and other components of the full Jones Fall Sewershed System, including relief sewers coming from the west in the Upper Jones Falls Sewershed. The review was conducted with concerns for environmental impacts, public health, transparency of government and compliance with local, state and federal laws

APPENDIX E – SOURCES

During its 15 month-long study, the GTA Investigative team reviewed documents, conducted field studies, and held multiple interviews with County senior sewer engineer and officials and other stakeholders, including neighborhood associations, citizen environmental groups and professional engineering consultants.

1. Documents

***The GTA review of documents in its investigation included but was not limited to:**

- Sewer interconnects map and maps of the Jones Falls Sewershed
- Dry Weather Pipe Capacity Analysis for County Meters – Future Conditions for the Jones Falls Sewershed
- Future pipe Capacity and Manhole Surcharge Summary 20-year/24-hour storm wet weather analysis
- 2014 Baltimore County Triennial Review for the Baltimore County Water Supply and Sewer Plan
- 2009 License Agreement for Robert E. Lee Park
- The 2002 Baltimore City and 2005 Baltimore County Consent Decrees
- Maryland Department of Planning and APFO Workgroup of the Maryland Sustainable Growth Commission best practices.
- 2016 Sewershed Repair, Replacement and Rehabilitation Plan for Jones Falls Sewershed
- Future Pipe Capacity and Manhole Surcharge Summary 10-year/6-hour Storm wet weather analysis
- 2006 Annual and 2016 Quarterly Baltimore County Consent Decree reports, and various Baltimore City Reports
- Blue Water Baltimore Harbor Alert Water Monitoring Reports
- The 1974 City-County Agreement
- Internet articles too numerous to list

* *for documents requested and not provided see Appendix I item 4*

2. Interviews

Interviews, discussions, phone calls and e-mails were conducted with the following persons, departments and organizations in the course of our investigation:

- Baltimore County Department of Public Works, Sewers Division (DPW)
- Blue Water Baltimore (BWB)
- Ruxton-Riderwood-Lake Roland Area Improvement Association (RRLRAIA)
- Baltimore County Department of Permits, Approvals and Inspections (Bureau of Development Plans Review)
- Baltimore County Councilpersons and staff in the 2nd and 5th Councilmanic Districts
- USA Environmental Protection Agency – Enforcement
- Maryland Department of the Environment - Compliance
- Chesapeake Bay Foundation
- Save Lake Roland

3. <u>Stream Walk</u>

The GTA investigative team conducted stream walks to gather data and record observations. An initial stream walk occurred May 30, 2016.

Towson Run stream walk 5/30/2016
wide streambed with mature trees

Black snakes seen in the Towson Run
streambed 5/30/2016

4. Observations Made of Sanitary Sewer Interceptor Manhole Stacks in Lake Roland Park and Adjacent Upstream Structures

Field Study performed May 4, 2017 by Roger Gookin

This report describes sanitary sewer interceptor manhole stacks observed in Lake Roland Park and adjacent upstream structures. It is likely that subsurface portions of the majority of these manholes and their base channels are constructed of the same brick masonry observed.

1. Antique Manhole Covers. Some manhole frame and covers appear to be original 1950's era cast iron. Most seem not watertight because they smell strongly and I can hear the flow through the pick holes. Some iron is degraded, some frames are broken and some covers don't seat to their frames.

Map Key #1

photo 2 (not on map)

Some frames, on both brick stacks and precast cones, are not sealed to the manhole structure.

photo 3 (not on map)

Map Key #4 (detail of Map Key #17)

(May 16, 2017 replaced blurred picture of broken frame base flange on Manhole 20756)

2. Most manhole stacks appear to be original 1950's brick. Some manhole stacks appear to be emergency field repaired because adjacent stacks are original:

Recent field repairs were made to this manhole the park ranger complained was stinking:

Map Key #5

Map Key # 6 detail

Recently field repaired manhole stack in the upper Jones Falls River bank:

MH 20757 - Map Key # 7

MH 20757 detail - Map Key #8

3. Some field repairs seem incomplete.

This is a water tight insert discarded in the adjacent field. There is no insert in this manhole:

photo 9 (not on map)

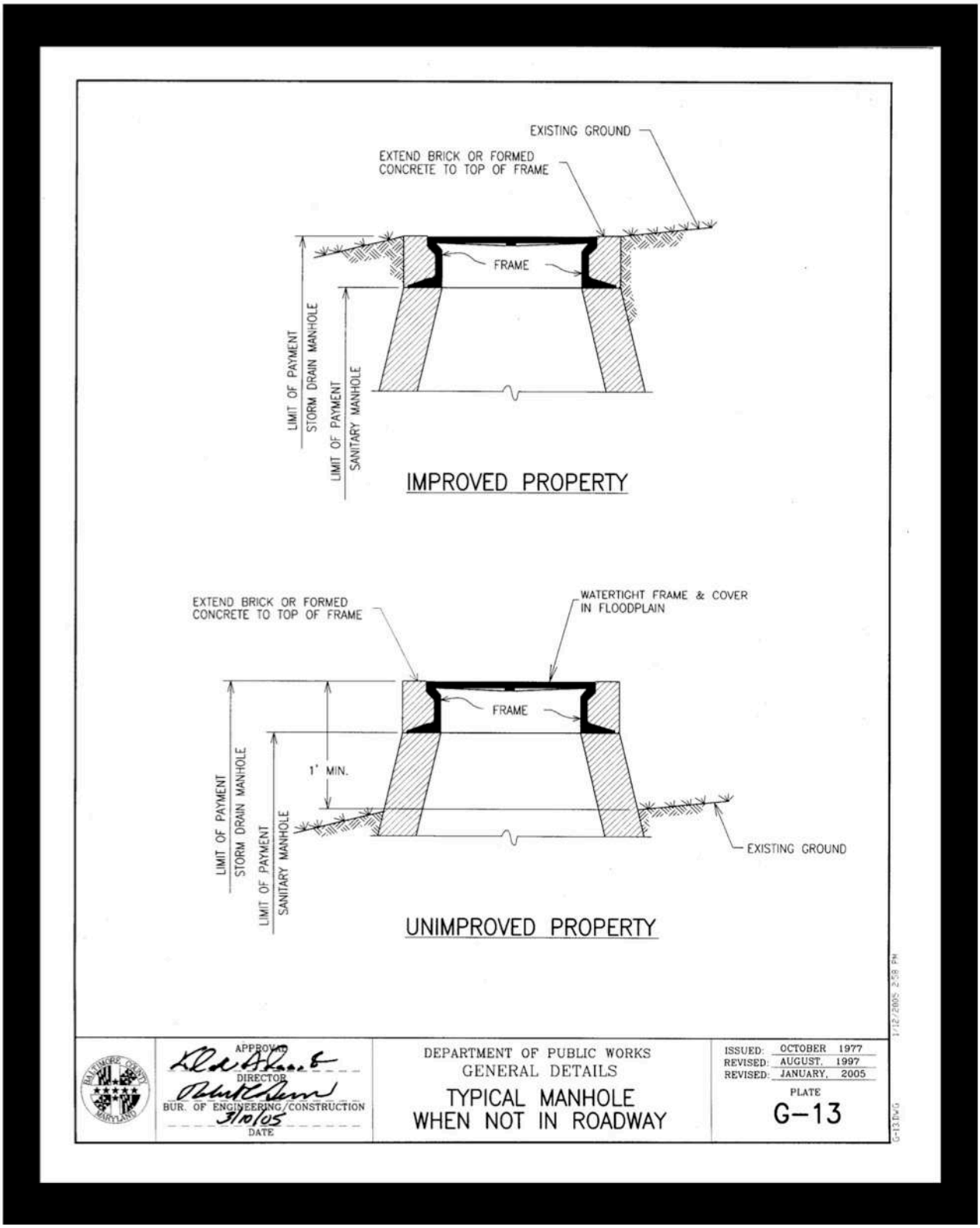
photo 10 (not on map)

Recently repaired stack 33709. Large log threat not removed and pargeting covers cobbles:

MH 33709 - Map Key #11

MH 33709 detail - Map Key #12

4. Some manhole stacks are not the minimum 12" above unimproved grade required by standard detail G-13:



This sewer manhole stack is flush to the ground in the Upper Jones Falls floodplain.

MH 20755 - Map Key #13

Degraded Roland Run manhole 6921 top is approximately 12" above the lake water level.

MH 6921 - Map Key # 14

5. Brick degradation and open wall cracks, both vertical and horizontal, in many structures:

Map Key # 15

Map Key # 16

6. Unrepaired flood damage to brick stacks:

MH 20756 - Map Key # 17

MH 34837 - Map Key #18

Lake Roland Park Interceptor Sewer Manhole Stack Observations

7. Damaged manhole tops:

MH 6887 - Map Key #19

photo 20 (not on map)

Notes:

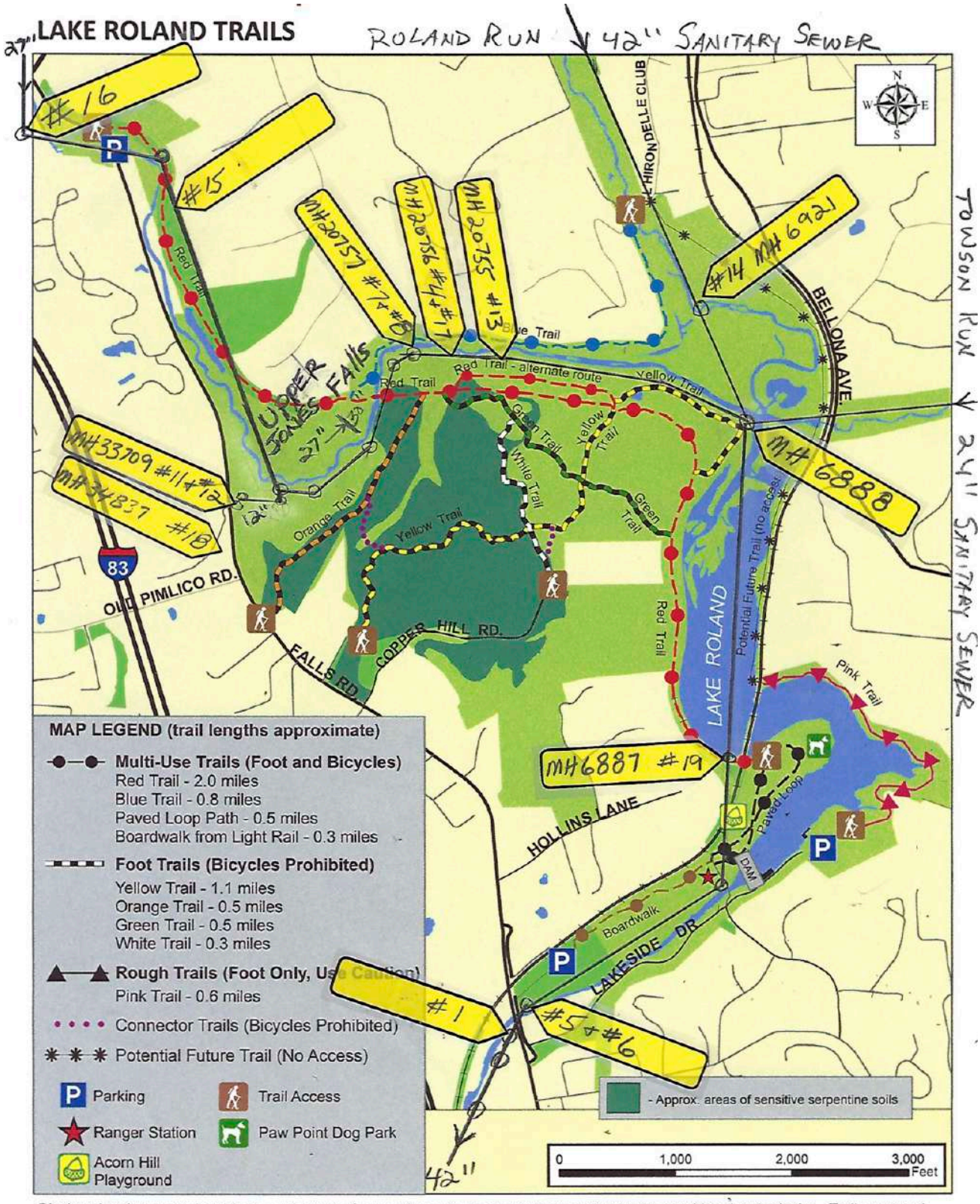
1. Baltimore County does not require strong manhole protection measures within floodplains. Some stacks are 12" or more above the "unimproved" adjacent marshland (per G-13), however they are obviously below recent moderate flood levels as observed by fresh floating debris caught in nearby shrubs. Silt observed on several manhole tops also indicates submersion.

2. Most manhole tops are not marked with witness posts and do not appear to have been opened in a long time.

3. There is significant accumulated flood debris in the Upper Jones Falls floodplain within Lake Roland Park. It appears several unfound manholes may be buried in silts and/or flood debris piles in the expected locations.

4. Access: There are no roads to access most of these critical infrastructure assets within the park flood plain for inspection and maintenance purposes. If urgent access for heavy equipment and material is required the emergency response will be delayed while roads are built in difficult conditions. Financial cost and environmental damage will be much greater accessing these locations with heavy equipment in an emergency.

KEY TO SEWER MANHOLE PHOTOGRAPH LOCATIONS



Displayed park property boundaries and extent of serpentine soils are approximate and not to be considered authoritative. Trails captured through the use of GPS equipment. Map created by the Baltimore County Department of Recreation and Parks, Revised June, 2014.

APPENDIX F – IS THE WET WEATHER CAPACITY PROBLEM IN THE JONES FALLS SEWERSHED BEING ADRESSED APPROPRIATELY?

GTA's analysis of DPW's data shows that there is a current capacity problem in the interceptors of the Jones Falls Sewershed System that occurs during wet weather when stormwater enters the pipes. How much capacity can be captured by reducing I&I and eliminating ISD's and is that enough capacity to accommodate growth in the sewershed?

1. Towson Run Relief Sewer

Based on the evidence provided, it is unclear if the costly new sewer is necessary. County sewer officials maintained:

- Towson Run Relief Sewer is needed because of capacity issues and storm system inflows in the existing Towson Run Interceptor Sewer.
- Capacity issues were due primarily to growth in Towson (consistently mentioning Towson Row, Towson University and Towson Plan), and occasional groundwater and storm water I&I.
- There is no determination of exactly where I&I issues occur in Towson Run.
- In initial conversation, a consultant's report, in all respects, provided the study, analysis and justification for a new 24-inch relief sewer including interceptor capacities down to the City line.
- The consultant's report was in "public domain"* and agreed that wet weather capacity analyses should be consistently applied throughout the system.

  * *after repeated requests since July 2016, this consultants report has not been provided to GTA and more recent inquiries are all referred to the legal department.*

The County's dry and wet weather analyses for its sewer pipes were analyzed by GTA, which compared pipe section capacities during dry and wet weather, and upstream and downstream capacities. Particular scrutiny was applied to statistics when pipe capacities exceed 100% due to the extent of I&I during storms. Baltimore County DPW Sewer Division provided its wet weather analysis for 20-year, 24-hour storm events to justify TRRS.

There were material differences between the two analyses, indicating that I&I is significant in the Towson Run sewer line during storms. Differences between upstream and downstream sections are also pronounced, with a handful of sections being well over 100% of full pipe capacity. Maps provided by a County official confirmed these problematic sections along the Towson Run sewer.

All of these acute areas have low slopes, which lower capacities. This pinpoints areas that are most impacted by problematic wet weather capacity issues in Towson Run, which could possibly be rehabilitated. A DPW official said he believed most of those areas were affected by household connections, due to old deteriorating infrastructure, tree root damage, and tying in private properties' gutter downspouts and storm drains. When asked about correcting these problems, he commented that although they probably have legal authority to remedy this, they didn't want to act "as a police state." This statement was repeated by the same official at the 7/20/2017 public hearing for the 2017 Triennial Review. This and other comments suggest a violation of the Consent Decree and potential waste of taxpayers' resources.

INFILTRATION & INFLOW FROM 20 YEAR 24 HOUR STORMS FOR PEAK FLOW CAPACITIES > 100% ON SEWERSHED MAP

Sewer Pipe Diameter	Downstream Manhole	Upstream Manhole	Capacity Dry Weather	Capacity Wet Weather
Upper Jones Falls interceptor				
27	20760	20761	40-50%	**111%**
30	20759	20760	>50%	**172%**
30	20758	20759	>50%	**179%**
30	20757	20758	>50%	**164%**
30	20756	20757	>50%	**197%**
30	20755	20756	>50%	**170%**
30	20754	20755	>50%	**114%**
30	20753	20754	>50%	**589%**
30	21328	20753	40-50%	**119%**
Roland Run interceptor				
42	6924	6925	30-40%	**116%**
42	6923	6924	30-40%	**119%**
Towson Run interceptor				
21	18322	7311	40-50%	**108%**
21	7305	7308	30-40%	**107%**
24	55251	7300	30-40%	**113%**
24	7297	7298	40-50%	**146%**
24	7296	7297	30-40%	**109%**
24	7295	7296	40-50%	**155%**
Lake Roland Park interceptor				
42	6887	6888	40-50%	**144%**
42	6886	6887	40-50%	**156%**

Towson Run Dry & Wet Weather analysis

The GTA investigative team reviewed a dry weather analysis of sewer pipes 10" and larger in the subject area. Using the tables in that document and referencing manholes on a sewer interconnect map provided by RRLRAIA, we verified that all sewer lines downstream of the Charles Street culvert are under 50% of capacity, most are under 40%, with many under 30% and only a few between 40-50%. The only section at more than 50% capacity is between Charles Street and Charles Street Avenue. When compared to the dry weather analysis, GTA investigators found acute problematic areas during wet weather, which seem to be localized to the pipe sections in the above table and in some sections upstream of the Charles Street culvert. These pipe sections corresponded to sewer maps provided by DPW showing problematic capacity issues.

2. **Upper Jones Falls Sewer**

Pipe section 33707-20761, south of manhole 20761 is listed in Baltimore County tables for wet weather pipe flow analysis for a 20 year 24 hour storm at 393% of capacity. All pipe sections between manhole 20761 and 21328 are over capacity during wet weather. Strange-looking increases in pipe flow capacities in the same diameter pipes can indicate changes in slopes (or slopes that actually flow backwards). The capacities are based upon engineering modeling, do not include any projected flows from a proposed PUD development, and may not include pipe flows from recent development in that area. GTA questions the adequacy of the planned relief sewers for this interceptor.

3. **Lake Roland Interceptor**

Conversations with County sewer officials, including the Sewer Design Chief, and a review of maps and data they provided have led GTA to the conclusion that the County was not focusing on the almost three thousand feet of 42" pipe under Lake Roland. The wet weather analysis originally provided to GTA by Baltimore County DPW was based upon a 20 year 24 hour storm, and also shows the almost three thousand foot stretch under Lake Roland between manholes 6888 and 6887 as being at 144% capacity. The next downstream pipe section is 872 feet and at 156%; one downstream pipe section with negative slope is at 456%.

Above 6888, the 42" line along Roland Run from the north can exceed 100%. The addition of another parallel sewer line along Towson Run to the existing 24" line and the 30" line from the Upper Jones Falls would seem to be imprudent at best. Despite contradictory statements from DPW regarding responsibility for this pipe, in reading the 50+ year lease of Lake Roland Park, and the transmittal letter, it seems clear that all operations and maintenance are now a Baltimore County responsibility, and the County fully indemnifies and holds the City harmless, etc. (A County official subsequently acknowledged responsibility after GTA's 10/5/16 report to EPA/MDE.)

Focusing on this section of sewer pipe is significant because:

- All of the Jones Falls sewershed lines from Towson Run, Roland Run and Upper Jones Falls converge at junction box/manhole 6888 at the north end of Lake Roland and flow south under the Lake to manhole 6887 in this one pipe.
- Other relief sewers are planned for the Upper Jones Falls Interceptor.
- Putting more sewage through TRRS from Towson Row, etc., and points west from the Upper Jones Falls Relief sewers without solving I&I issues, further exacerbates this existing "weak link" bottleneck.
- This is a very old pipe, with resultant capacity loss, that is submerged in a lake, surrounded by three stream deltas and flood plains, with historic and continual upstream flooding from rainstorms, and is downstream from a large and growing urban center
- Directly downstream from this sewer pipe are the problematic sections in the City that routinely overflow and spill with outfall releases into Jones Falls and Inner Harbor, and
- Most of this sewer infrastructure is beneath or adjacent to popular multi-use (Red Trail) and foot (Yellow Trail) nature trails in Lake Roland Park. The lake is used recreationally for boating and fishing, and Paw Point Dog Park provides access for dogs to swim.

The GTA Manhole Survey in Lake Roland Park documents a variety of deficiencies including antique manhole covers that leak, original 1950's degraded and/or flood damaged brick stacks, incomplete field repairs, stacks threatened by debris, manholes flush to the ground or below flood level in the floodplain and damaged manhole tops. This is further evidence that the Consent Decree mandate to eliminate I&I is not being met. (See Appendix E).

APPENDIX G – ENVIRONMENTAL IMPACT AND BALTIMORE CITY'S STONEY RUN ROLE MODEL

The access roads and construction for the proposed TRRS will significantly impact the natural habitat along the section of Towson Run west of Charles Street, and likely to nearby neighborhoods. The County received a variance from the MD Forest Conservation Law in October 2016 allowing them to remove 21 specimen trees for the construction of the relief sewer from Towsontown Boulevard to Bellona Avenue. A specimen tree is a tree that is 30 inches in diameter or larger at breast height. These trees are often 80-100 years old and provide many environmental benefits. A 30-inch diameter oak tree can absorb around 13,000 gallons of storm water per year. In addition to the specimen trees, countless additional smaller, mature and healthy trees will need to be removed to install the relief sewer. Amongst the local fauna of the Towson Run stream valley, a toad population is well known for its annual migrations route.

EPS Tracking Number: 02-16-2341
Project Name: Towson Run Relief Sewer
Project Address or Location: Towsontown Boulevard to Bellona Avenue
Application Date: October 25, 2016
Decision Date: November 28, 2016
Status: Approved (PDF)

Nature of Variance Request: The Department of Environmental Protection and Sustainability hereby gives notice that a variance in accordance with Section 33-6-116 of the Baltimore County Forest Conservation Law was requested to remove or critically impact 21 specimen trees to construct a relief sewer parallel to an existing sewer in accordance with a Federal Consent Decree.

source:
https://www.baltimorecountymd.gov/Agencies/environment/variances/district2.html
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A Positive Role Model in Baltimore City's Stoney Run Neighborhoods

A community liaison met regularly with neighborhood associations throughout the five-year process to replace an 80-year old sewer interceptor that was causing sewage overflows into the Stony Run in northern Baltimore. This sewer system upgrade, the result of a 2002 Consent Decree, brought the area into compliance with the Clean Water Act. Work included:

- A new pumping station
- Replacement of the old interceptor with a 60-inch fiberglass interceptor 80 feet below ground level
- Restoration of a soccer field and two baseball fields, and replacement of an oak tree, as well as curbs, gutters and sidewalks in an area designated to become a community garden
- Removal of an access road used during construction, and the repaving of two streets.

A stream restoration project that took place during the sewer system work resulted in the return of frogs and crayfish in the stream and lush tree plantings that shade and cool the stream bed.

APPENDIX H – PUBLIC HEALTH: ARE OUR WATERS SAFE?

Blue Water Baltimore conducts regular water quality monitoring that indicates the Lake is rarely safe for water contact due to fecal contamination. The Healthy Harbor Report Card graded water quality in Lake Roland and Towson Run, Roland Run and Ruxton Run streams with "Fs." Meanwhile, the Lake Roland Nature Council encourages kayaking and canoeing, hosts a "Fishing Fun Day" for ages 6 and up and allows dogs to swim in the lake. They report using Baltimore County Department of Public Health (BCDPH) data about fecal contamination in local waterways to determine when the dog park water access is closed. The BCDPH has posting protocols when they determine that water quality poses a public health risk, however, BCDPH readings are not provided after every rainstorm, which does not seem prudent. Does the discrepancy between the independent water quality monitoring by Blue Water Baltimore and the Baltimore County water monitoring pose a risk to public health?

Lake Roland Park recreational water

State of Maryland Health Risk numeric for recreational water contact
Colonies of Enterococcus fecal bacteria per 100 mL of water
Low <61 Medium 61-151 High >151

	A	B	C	D	E	F
1	Date	Lake Roland	Towson Run	Ruxton Run	Roland Run	Upper Jones
2		Reservoir				Falls B
3						
4	05/07/13	10	40	10	290	60
5	05/21/13	10	120	100	530	150
6	06/11/13	20600	n/r	n/r	n/r	n/r
7	06/25/13	200	40	100	500	340
8	07/09/13	200	120	450	1160	330
9	08/06/13	32800	370	270	880	530
10	09/03/13	110	1150	220	320	190
11	09/17/13	30	60	70	180	640
12	10/01/13	10	100	90	140	70
13	10/15/13	30	130	130	230	160
14	10/29/13	10	10	50	490	50
15	11/12/13	10	30	70	50	30
16	04/01/14	350	10	10	50	30
17	05/06/14	10	30	60	30	30
18	06/03/14	10	160	110	660	90
19	07/01/14	20	300	160	660	450
20	08/12/14	660	2140	5480	2010	740
21	10/21/14	20	20	20	70	40
22	11/06/14	10	5790	3650	5170	1990
23	12/09/14	50	820	1050	1660	880
24	01/14/15	160	310	n/r	210	200
25	02/03/15	70	n/r	0	80	20
26	03/03/15	40	110	50	90	130
27	04/14/15	0	10	40	50	50
28	05/12/15	110	210	31	680	79
29						
30		Low + Medium + High health risk readings from May 7, 2013 to May 12, 2015				
31		15+3+7	9+5+9	8+7+7	4+4+16	8+5+11
32						
33	Data from Blue Water Baltimore Harbor Water Alert http://www.harboralert.org/stations/31					
34	Enterococcus is a reliable indicator for waterborne human pathogens such as Staphylococcus,					
35	Hepatitis A, Cryptosporidium, West Nile Virus and other microorganisms that can cause					
36	gastrointestinal illness and skin and eye infections.					

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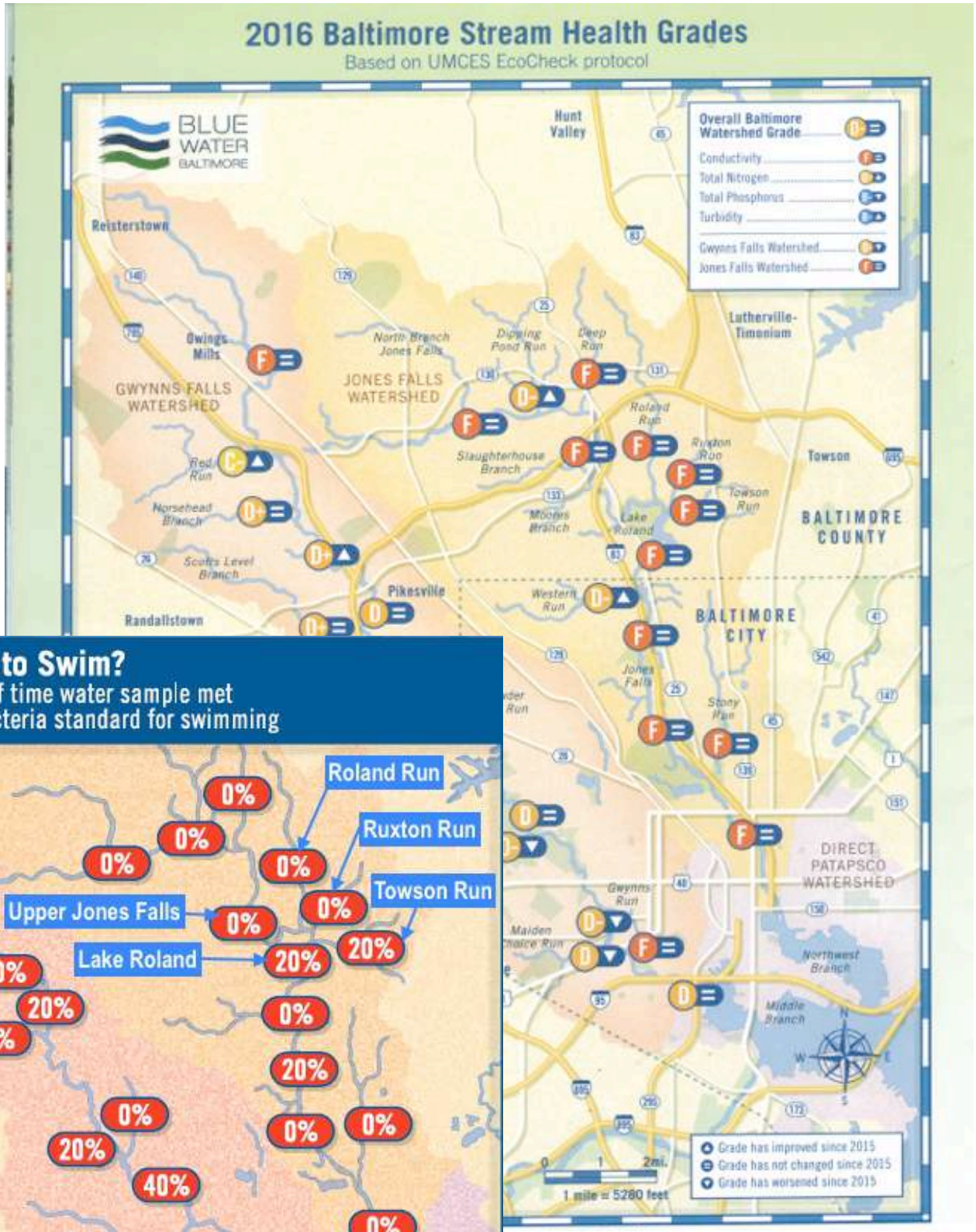
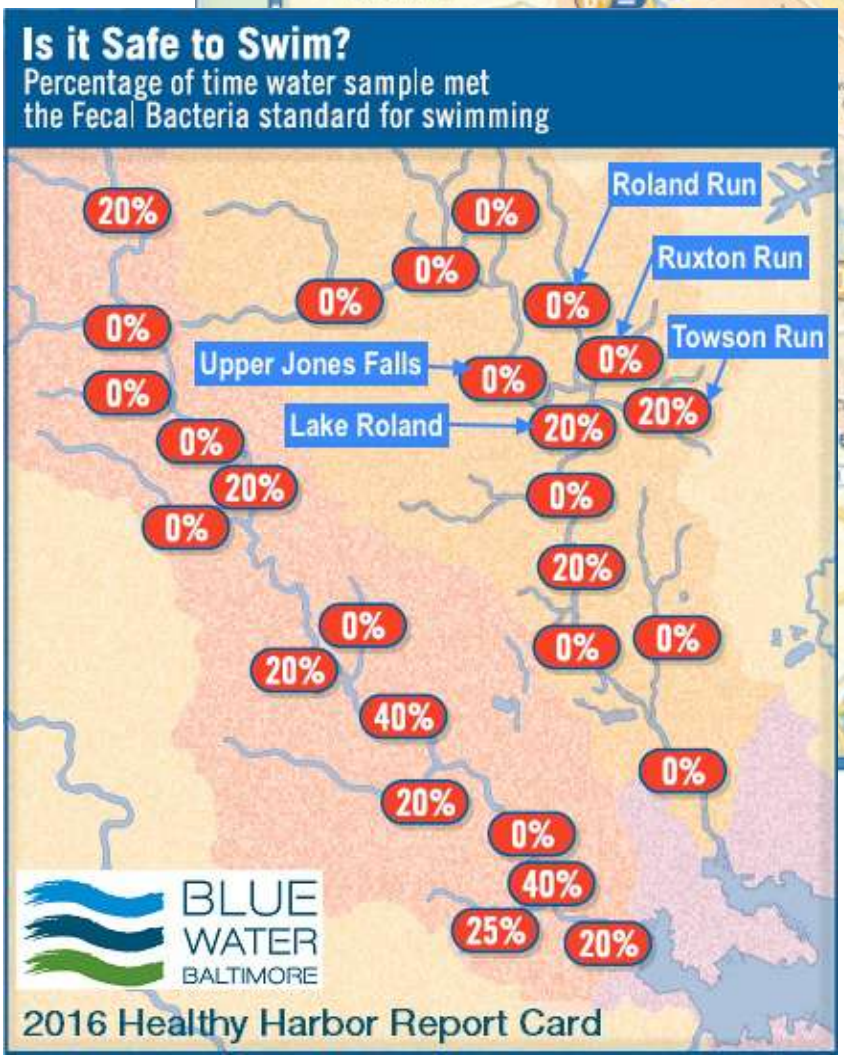
Lake Roland Park recreational water

State of Maryland Human Health Risk numeric for recreational water contact
Colonies of Enterococcus fecal bacteria per 100mL of water
Low <61 Medium 61-151 High >151

	A	B	C	D	E	F
1	Date	Lake Roland	Towson Run	Ruxton Run	Roland Run	Upper Jones
2		Reservoir				Falls B
3	06/09/15	24196	7700	5200	24196	24196
4	07/07/15	49000	1500	4900	14000	7800
5	08/04/15	130	2900	1800	9200	1700
6	09/01/15	52	310	210	460	160
7	10/06/15	63	110	63	210	230
8	11/03/15	20	210	73	230	880
9	12/01/15	720	840	620	1500	3400
10	01/12/16	3300	160	97	86	120
11	02/24/16	1400	780	n/r	860	340
12	03/01/16	20	84	52	31	52
13	04/05/16	86	97	230	52	110
14	05/03/16	2000	770	520	2200	2200
15	06/07/16	140	450	230	960	460
16	07/05/16	260	4900	6900	14000	7300
17	08/05/16	20	20	130	360	140
18	09/06/16	95	310	500	75	160
19	10/04/16	97	300	340	540	370
20	11/01/16	110	52	74	190	96
21	12/06/16	0	0	0	0	10
22	01/24/17	260	230	780	530	700
23	02/07/17	0	1	4.1	12	8.4
24	03/07/17	0	2	0	1	5.2
25	04/04/17	93	67	13	44	4.1
26	05/02/17	10	30	85	110	31
27	06/06/17	0	63	n/r	520	20
28						
29		Low + Medium + High health risk readings from June 9, 2015 to June 6, 2017				
30		9+8+8	5+5+15	5+6+12	6+3+16	7+4+14
31						
32	Data from Blue Water Baltimore Harbor Water Alert http://www.harboralert.org/stations/31					
33	Enterococcus is a reliable indicator for waterborne human pathogens such as Staphylococcus,					
34	Hepatitis A, Cryptosporidium, West Nile Virus and other microorganisms that can cause					
35	gastrointestinal illness and skin and eye infections.					

In a memo dated July 19, 2017 to the County Administration, the Lake Roland Nature Council states they typically close water access for the dog park once per year after an exceptionally heavy rain. This statement does not seem consistent with the State of Maryland Human Health Risk numbers or with the Blue Water 2016 Baltimore Stream Health Grades in the adjacent chart





source:
http://www.harboralert.org/images/2016_HHRC.pdf

APPENDIX I – TRANSPARENCY AND COMPLIANCE

Our investigation was hampered because many requests for information from government agencies were not fulfilled. Statements by government officials were contradictory with other government officials and with documentation. The following items are of particular concern with regards to transparency:

1. **<u>Disclosures about Adequate Public Facilities Ordinances</u>**

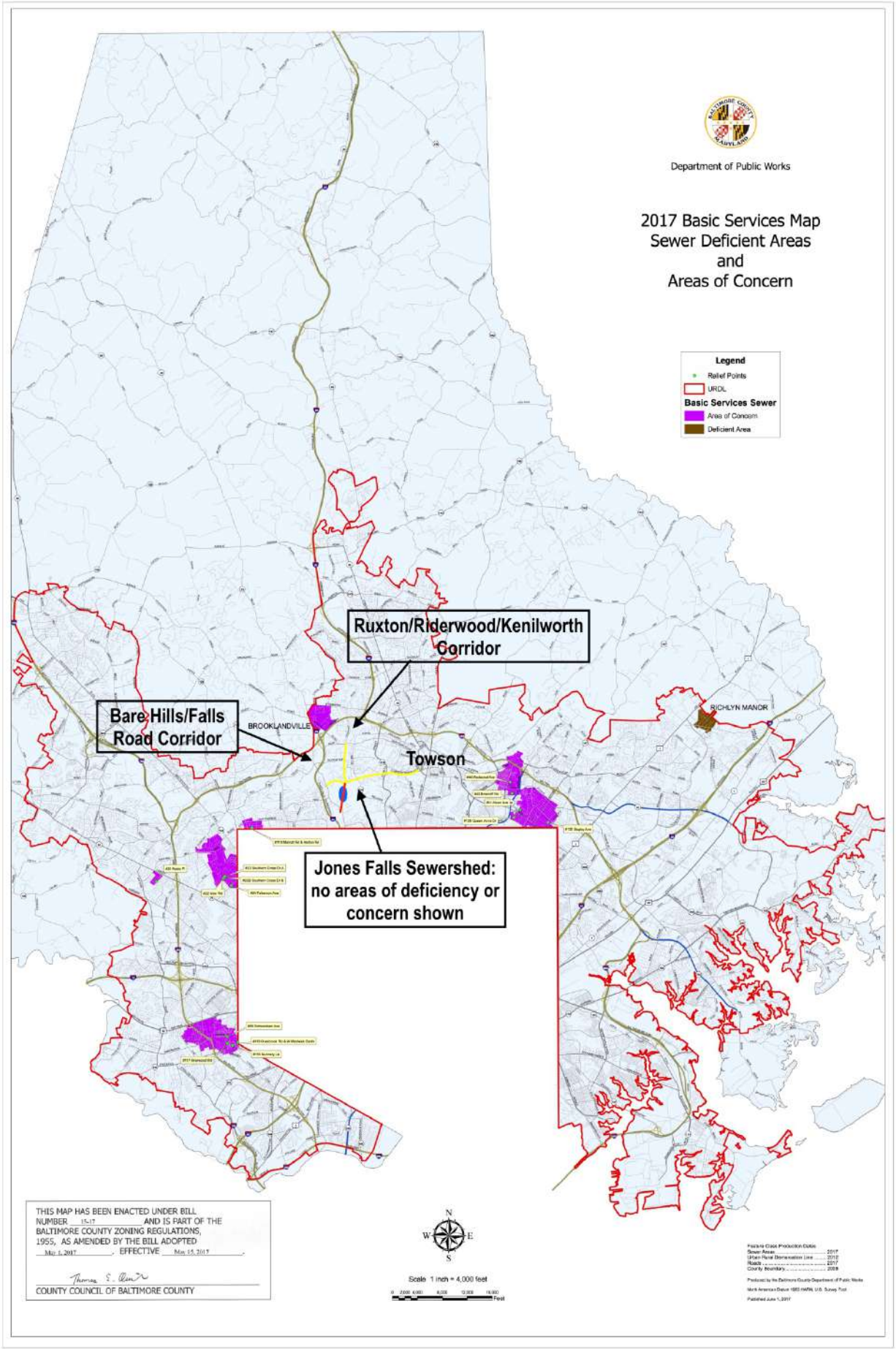
   Development in the Towson area of Baltimore County does not appear to follow best practices with regards to Adequate Public Facilities. By example, a Planned Unit Development called the Village of Lake Roland that was proposed in the Bare Hills area of the Upper Jones Falls Sewershed. The PUD application indicates that:

   " ... According to the 2016 Basic Services Maps, the Property is not located within a deficient area or area of special concern for either water or sewer. The public water and sewer service is sufficiently sized to accommodate the project. Therefore, the project will not result in any negative impact to Baltimore County's water and sewer infrastructure."

   The Preliminary PUD Review Comments by Bureau of Development Plans Review state:

   "Contrary to the statement on the last page of the PUD Application, the downstream sewer does not have the capacity to convey the flow from this proposed development. The County is in the process of designing and permitting a relief sewer; however capacity will not be available until the sewer is built. The resolution should state that the developer will help pay for the work if he wants to proceed immediately or wait until the work has been completed."

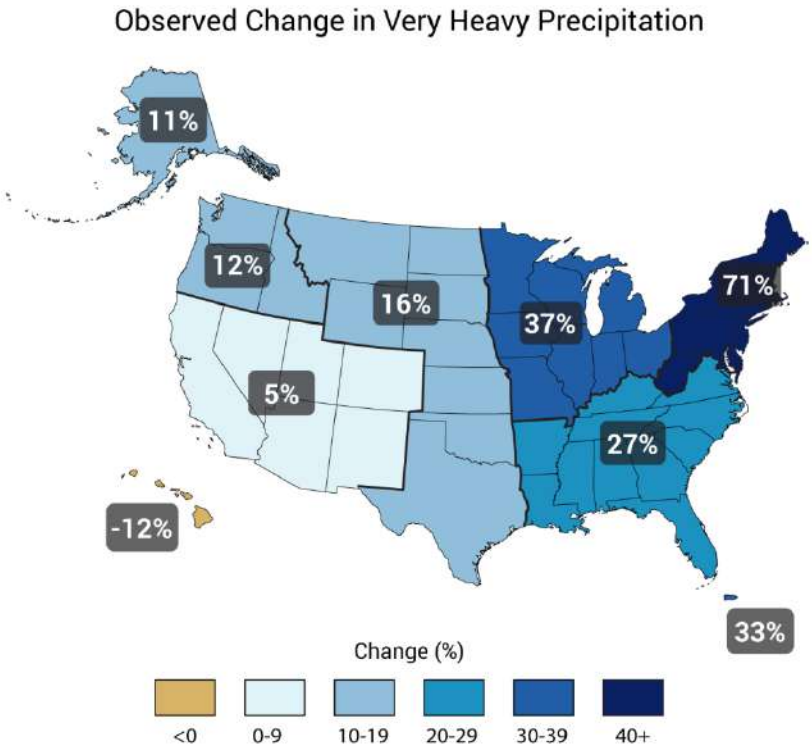
   The existing sewer interceptor is seriously over capacity based on DPW data, yet did not appear as an area of deficiency on the 2016 Basic Service Map or in the 2014 Triennial Review. The Towson Run interceptor deficiencies are not on the map or in the 2014 Triennial Review either. When officials at the Baltimore County Department of Permits, Approvals and Inspections were asked why this was not on their map, the response was that the 2016 Basic Services Map does not reflect all the areas of concerns and deficiencies because if it did, there would be no development. When asked what put things on the map, the response was "actively overflowing sewers and related development restrictions." Areas that have been identified by Baltimore County to require multiple relief sewers due to capacity and other issues are not identified as either areas of concern or deficiency on the Basic Services Maps. How do the basic services maps provide development guidance, understanding of capital projects and budgets and equitable sharing of costs for infrastructure improvement needed for growth without including this information?


Department of Public Works
2017 Basic Services Map
Sewer Deficient Areas
and
Areas of Concern
Legend
Relief Points
URDL
Basic Services Sewer
Area of Concern
Deficient Area
Ruxton/Riderwood/Kenilworth Corridor
Bare Hills/Falls Road Corridor
BROOKLANDVILLE
Towson
RICHLYN MANOR
Jones Falls Sewershed: no areas of deficiency or concern shown
THIS MAP HAS BEEN ENACTED UNDER BILL NUMBER 15-17 AND IS PART OF THE BALTIMORE COUNTY ZONING REGULATIONS, 1955, AS AMENDED BY THE BILL ADOPTED Mar 6, 2017. EFFECTIVE Mar 15, 2017.
COUNTY COUNCIL OF BALTIMORE COUNTY
N
W
E
S
Scale 1 inch = 4,000 feet

2. Design models

Baltimore County and Baltimore City appear to be using different storm models to predict peak flows pipe capacities in their sewer systems, even though those systems are interdependent across jurisdictional lines, and they need to ensure adequate long-term transmission capacity in both collection systems. Baltimore County used a 10-year 6-hour storm model for their 2016 Jones Falls Sewer Repair, Replacement and Rehabilitation Plan rather than 10-year and 20-year 24-hour storms required for predicting peak flows in both Consent Decrees. Both jurisdictions are required to report at what point the system will fail. What are the implications of the County not designing for the full range of storm events prescribed by the Consent Decree? Is Baltimore County not planning to eliminate all SSO in its sewer collection system? What is the effect on Baltimore City? These implications and de facto changes in goals should be clarified and disclosed to the public.

Climate data indicates that heavy precipitation is increasing over time, supporting the use of more intense storm designs. The National Climate assessment shows that heavy precipitation has been increasing nationally since 1991, with Maryland being in the area of greatest increase.



From the National Climate Assessment

"Across most of the United States, the heaviest rainfall events have become heavier and more frequent. The amount of rain falling on the heaviest rain days has also increased over the past few decades. Since 1991, the amount of rain falling in very heavy precipitation events has been significantly above average. This increase has been greatest in the Northeast, Midwest, and upper Great Plains – more than 30% above the 1901-1960 average (see Figure 2.18). There has also been an increase in flooding events in the Midwest and Northeast where the largest increases in heavy rain amounts have occurred."

http://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing#intro-section-2

3. Baltimore County Water Supply and Sewerage Plan 2017 Triennial Review*

As the Plan applies to community sewerage systems, the 2017 Triennal Review fails to meet the standards set out in the Water and Sewerage Plan law and regulations, not to mention the Consent Decree, the 1974 agreement with Baltimore City, and state and federal water quality laws. The Triennial Review fails to identify the problems described in Appendix F on the Jones Falls Sewershed as they pertain to the Lake Roland interceptor, and the three sewershed interceptors serving Towson Run, Roland Run, and Upper Jones Falls. The Plan makes no mention and supplies no documentation of the issues that have been set forth elsewhere in this paper, including disclosures about areas it states require relief sewers, one of which is underway.

The macro geographic, highly summarized scale of the data, the lack of flow and capacity analysis for each sewershed, the consolidated capital program that only shows broad categories of projects and costs do not meet the specific requirements for the content of the plan nor its overall purposes as required by law and regulation.

TABLE A – SAMPLE OF LEGAL REQUIREMENTS AND COUNTY'S PERFORMANCE *

REQUIREMENT FOR TRIENNIAL REVIEW	REGULATION CITATION	PROVIDED IN WATER & SEWERAGE PLAN - 2017 TRIENNIAL REVIEW
"*shall contain a description of the existing and planned community and multi-use sewerage systems, including tables, maps, charts, graphs, descriptive information and all other matters regarding these systems."*	**COMAR 26.03.01.04F and .04.G.2	SEWER MAPS DO NOT SHOW ANY PLANNED SEWER PROJECTS, AREAS WITH EXISTING OR POTENTIAL PROBLEMS, OR ANY INFORMATION KEYED TO A CAPITAL BUDGET
Water Quality Criteria Map or Table	COMAR 26.03.01.04D.1.b	NOT PROVIDED
Projected demand vs. capacity by small sewershed	COMAR 26.03.01.04 E(1) Table No. 9 Projected Sewerage Demands and Planned Capacity 2005 CONSENT DECREE 9 C. ii (a) pg 28 9.C. ii (b) pg 28 9.C. ii (d) pg 30 all sewersheds for year 2025	NOT PROVIDED BY SMALL SEWERSHED. PROVIDED AT COUNTY WIDE SCALE ONLY
Land Use / Development Projections by small sewershed	2005 CONSENT DECREE 9.C. ii (a) pg 28 9.C. ii (b) pg 28 all sewersheds for year 2025	NOT PROVIDED. PROVIDED AT COUNTY WIDE SCALE ONLY
Current and Projected Flows by small sewershed	COMAR 26.03.01.04 F(1) Table No. 9 Projected Sewerage Demands and Planned Capacity 2005 CONSENT DECREE 9.C i pg 27 all sewersheds 9.C i pg 27 all sewersheds 1974 CITY-COUNTY AGREEMENT Article V, B&D	NOT PROVIDED BY SMALL SEWERSHED PROVIDED COUNTY WIDE BY SEWAGE TREATMENT PLANT SERVICE AREA ONLY

REQUIREMENT FOR TRIENNIAL REVIEW	REGULATION CITATION	PROVIDED IN WATER & SEWERAGE PLAN - 2017 TRIENNIAL REVIEW
System Capacity Calculations by small sewershed	2005 CONSENT DECREE 9.C. ii (d) (2) pg 30	NOT PROVIDED
Identify Existing Facility Capacity constraints by small sewershed based on system capacity calculations, including I&I	COMAR 26.03.01.04 Table No. 11 Problem Areas Inventory - Individual and Community 2005 CONSENT DECREE 9.C. ii (d) (1)&(3) pg 29 9.C. i pgs 26,27 all sewersheds	NOT PROVIDED
Identify Combined Sewer Overflows	2005 CONSENT DECREE included in SSO and Discharges IV Definitions 6 Z. pgs 7,8 and H. pg 5	NOT PROVIDED
Identify Future Capacity Needs by small sewersheds	2005 CONSENT DECREE 9.C. ii (d) (4)&(e) pg 30	NOT PROVIDED
Capital Projects needed to address current and 10 year needs by small sewersheds	Environmental Article 9-503 (a)(2) Table No. 13 Immediate 5 and 10 Year Priorities for Sewerage Development 2005 CONSENT DECREE 9.C. i pg 27 9.C. ii pg 28 9.C. ii (d) pgs 29,30 all sewersheds	NOT PROVIDED BY SMALL SEWERSHED PROVIDED BY LARGE CATEGORIES MOSTLY BY PROJECT TYPES WITH NO TIME FRAMES. NOT PROVIDED AS A STAGED 10 YEAR LIST
Projects to remediate I&I and eliminate CSOs	1974 CITY-COUNTY AGREEMENT Article VI, A&B 2005 CONSENT DECREE 9.C. i pg 27 9.C. ii pg 28 9.C. ii (d) pgs 29,30	NOT PROVIDED
Rationale for selecting a planned alternative for any proposed...pumping station, or interceptor	COMAR 26.03.01.04F	NOT PROVIDED
For every service area ...the following should be discussed: design average and peak flows; whether combined or separate ...systems;... condition of transmission facilities;... operation and maintenance costs;...and proposed means of financing improvements.	COMAR 26.03.01.06F, Table No. 15A Flow Data, Collector Sewers, Inceptors, Pumping Stations and Force Mains	NOT PROVIDED

**as of the writing of this paper, only a draft copy of the 2017 Triennial Review was available. However, the investigative team's review of the 2014 Triennial Review revealed the same basic shortcomings outlined above and in the chart*

***COMAR Title 26 MDE Subtitle 03 Water Supply, Sewerage, Solid Waste and Pollution Control Planning and Funding*

4. Outstanding Questions and Documents Requested

GTA reported its concerns to EPA, MDE and DOJ on October 5th, 2016, after conferring with, and upon the recommendation of District 2 and 5 Councilmember offices. There have been repeated follow up efforts, conversations and reports by GTA since then. To date, GTA has not been told why Baltimore County has not provided the GTA Investigative team with data which appear to be required by the Consent Decree for I&I evaluation and long-term/peak flow capacity management evaluation.

The following is a list of questions and requests by GTA have made to the County, to which an evasive or inconsistent answer or no answer was received:

- Requests for summary project documentation describing project scope, engineer's report and recommendation, estimated budget and timelines, and specific rationale and analytical support for remedial actions.
- Requests for specific population projections for Towson Row, Towson University, etc. that reflect growth impacts on capacities versus generalities about growth.
- Is there any I&I analysis on the existing Towson Run sewer? How would a parallel sewer line address reducing existing I&I and illegal storm water discharges?
- Are any funds budgeted and/or plans to address the Towson Run sewer line I&I? If so, what would be the predicted impacts on wet weather capacities?
- Where do we find the TRRS project and budget in the list of current Baltimore County sewer projects? What is the complete list of these projects and project budgets in the Jones Falls Sewershed for greater Towson? Are the identified weak links (LRI bottleneck) included?
- What sewer pipe capacity thresholds generally trigger remediation projects given that maps and tables provided by DPW to justify TRRS used 20/24 storm event capacities?
- How did Towson Row and Towson University projects get approved, and other development projects, given the 2002 and 2005 (City and County) Consent Decrees, the single 42" sewer pipe downstream under Lake Roland having been analyzed by Baltimore County at 144% wet weather capacity, and other downstream issues?
- Are Towson developers paying for all needed sewer capacity? If I&I can be solved, GTA would expect developers to pay for all additional capacity that would be required for growth in sewer flows driven by their projects.
- Do any other areas pump sewage into the Roland Run interceptor, which flows under Lake Roland? Are there opportunities to pump sewage to other systems or establish a community water and energy resource center at Towson University, Hospitals, etc?

Documents that were requested from Baltimore County Department of Public Works that were not provided to our team include:

- The consultant's study, analysis and recommendation for justifying for the Towson Run Relief Sewer, including interceptor capacities to the City line referenced by DPW.
- Copy of Sewer Repair, Replacement and Rehabilitation Plan for Jones Falls Sewershed
- Inflow/Infiltration Evaluation and Long-Term Capacity/Peak Flow Management Evaluation for the Jones Falls Sewershed
- The initial Sanitary Sewer Overflow Map and most recent update.
- Copies of all Consent Decree Annual and Quarterly Reports.

APPENDIX J – IMPROVEMENTS TO 2017 AND FUTURE TRIENNIAL PLANS

Considering the issues of rapid growth and of major costs it is facing, we suggest the County consider the following upgrades to the 2017 and future Triennial Plans:

1. **Transparency**
   - Provide sufficient level of detail at the Sewershed level for independent review of assumptions, modeling, and conclusions for planning
   - Provide adequate future reporting at the Sewershed level for independent tracking of outcomes.
   - Provide complete plan and tracking disclosure in adequate time for decision-makers and public scrutiny and discussion, at the Sewershed level. In particular, complete information, not drafts, should be published to the public at least 45 days in advance of any Council or Board or Commission hearings or votes on Budgets, Plans or other Approvals, (Current practice is to provide information so late, and at such summary levels or in so much uninterrupted detail as to be useless outside the Sewer Department itself.)
   - Require responses from Agencies to any questions or comments from the public or requests for clarification or information from the Council or Board or Commission and provide adequate time for review. Public input and questions should be raised at or submitted up to 7 days following the Council or Board or Commission hearings. Responses should be provided at least 10 days in advance of a subsequent hearing or vote. The Council or Board or Commission should require a second hearing if substantive testimony, clarifications or questions are not adequately or timely addressed in responses by the Agency.

2. **Integrity**
   - Upgrade modeling technique to include range of need* projections rather than single trend line based on static and incomplete assumptions.

     * *Improve ways of including needs of known development proposals in early stages instead of current method of forecasting needs looking at one development at a time, with only approved projects factored in. (Current methods ignore the many projects at various stages in the development pipeline, which can be a significant distortion.)*
   - Provide capacity of each part and the overall system by Sewershed under wet weather conditions identical to those used by the City, with identification and prioritization of bottlenecks, including contribution to downstream bottlenecks. Also take into account age and likely condition of pipes, topographic features, historic I&I and flooding, and population projections.
   - Full disclosure of alternative ways to match needs and capacity, including meaningful degree of repair for leaking pipes (infiltration and inflow) and seeking best practices.
   - Clearly define operative key words/terms and standards such as adequate capacity.

3. **Costs**
   - Include cost/benefit analysis for every strategy proposed for approval, identified by Sewershed. This should include full costing and discussion of environmental damage and degradation and public health impacts, according to best practices.
   - Disclose reasoning for selection of recommended strategies, including discussion of costs/benefits and other impacts on stakeholders.

4. <u>Equity</u>

- Implement immediately a zero tolerance of deliberate discharging of waste into our waterways.
- Document current practice and devise and implement any more equitable ways to share the costs of upgrading our sewer capacity to accommodate the high growth planned for the Towson Area.
- Consider and understand lessons from the example of the Towson Row development, with 770 dwelling units and a total of 1.2 million square feet of active human occupation. To our knowledge, this development bears no cost for its huge contribution to sewer needs, despite the system being at a tipping point requiring expensive upgrades and repairs before Towson Row can be occupied.
- Document the impact on sewerage costs of the growth of Towson University under the current plan. Evaluate community water and energy resource center application for Towson institutions and/or pumping sewage to other systems. Seek energetically to obtain a State contribution to cover same.