Testimony of Michael Gravitz, as a citizen
Chair Conservation Committee, Audubon Naturalist Society
Before the Montgomery County Planning Board

In the Matter of the Ten Mile Creek Limited Master Plan Amendment
September 10, 2013

Introduction

Thank you, Chair and members of the Planning Board for holding this important hearing on the future of drinking water for the DC Metro area, water quality in Little Seneca Reservoir, Ten Mile Creek and the livability of Clarksburg. Though I chair the Conservation Committee of the Audubon Naturalist Society, I appear this evening as a citizen. I am not unfamiliar with this room, having served in the late 1980's and early 1990's on two separate Citizen Advisory Committees to the Silver Spring CBD Sector Plan process and one Citizen Advisory Committee on the County's Growth Plan. At the time I lived just north of Spring Street in Woodside Park where for a decade I was intimately involved in efforts to redevelop downtown Silver Spring. I advocated for the style and level of development that now makes downtown Silver Spring such a vibrant place as opposed to a series of office towers and huge enclosed regional mall. For over 20 years I served on the board of a national water quality and drinking water nonprofit called Clean Water Action, an organization working on these issues in approximately 14 states including Maryland. I have lived in this County since 1980.

At various times in my life I have been a business consultant, an entrepreneur who started two government software companies, an environmental lobbyist, and a political activist. I have a Masters degree in public policy from the Kennedy School of Government.

I recount this background not to 'toot my own horn' but to show you my long term interest and long commitment to clean rivers, streams and drinking water and the best possible land use planning for Montgomery County communities. Since I currently live in Chevy Chase, I cannot be labeled a NIMBY trying to keep development out of my backyard in Clarksburg. Rather I am trying to help you see the critical importance of preserving as much as possible of the Ten Mile Creek watershed in its current forested and farmed state, rather than being rather intensely developed for housing and commercial purposes.

The purpose of my testimony is to remind you what the 1994 Clarksburg Master Plan (the Plan) says and doesn't say because many people will have assertions this evening about what the Plan contains. Specifically, various development interests will asset that they invested heavily in the Ten Mile Creek watershed relying on the Plan **and** that you and the County must not change the Plan's basic outline to lower densities and preserve Ten Mile Creek because that would be breaking a special 'trust'. Once land use decisions urged on by developers are embedded in plans, government bodies should not change those plans or they risk breaking that trust even if the plan says those decisions are

contingent on preserving the health of local streams, forests, and providing for livable communities. In other words, the development community says, 'forget the contingencies clearly embedded in the 1994 Plan and focus on the tables and maps that show large development capacity.'

In sum, they will assert that the old 1994 Plan supports their proposals and that you must follow through on a 19 year old plan in order to guarantee their anticipated profitability. You are held responsible for their Return on Investment and you had better not change the 'rules' midstream; that wouldn't be fair. Unfortunately, what you will learn from the 1994 Plan was that it pre-supposed or assumed that the Plan might change midstream. It explicitly says that new evidence, evidence developed after the 1994 adoption, will affect the Plan and its recommended development densities.

Leaving aside the obvious fact that you are NOT responsible for guaranteeing the development community's profitability on the investment decisions they made in Clarksburg, I believe with a close reading of the 1994 Plan, you will find that many of their assertions are incorrect. The development community fundamentally misread the Plan because in almost every section of every chapter the 1994 Plan calls for revisiting its conclusions after the first three stages of development are completed in Clarksburg and the County has had the opportunity to assess the impact of that development on water quality in local streams and on Little Seneca reservoir, the emergency drinking water supply for approximately 4 million people in the metropolitan area.

The 1994 Plan says that only after the County has had a chance to assess the potential further impact of development proposed in Stage 4 and after the County has had a chance to assess the efficacy of any advances in storm water management that occurred after 1994, will a new plan for Stage 4 be prepared. We are now in the process of preparing that new plan for Stage 4. Hence, the 1994 Plan assumes that you and the County Council will change the 1994 Plan for Stage 4 and do so in a way that protects the sensitive Ten Mile Creek watershed, Little Seneca, and surrounding lands.

Evidence For "Environmental Precaution" From the 1994 Plan

There are numerous references to the need for environmental precautions in the 1994 Plan when it discusses future development. To be sure, the Plan does include areas to be developed and the zoning map to enable development. To be sure, the Plan includes a table that shows a "Maximum End-State Development Potential" of 1,240 dwelling units and almost 1 million sq. ft. of commercial & retail space for the Ten Mile Creek Area (pg 40, Table 2, Chapter 3) BUT this was supposed to be subject to a critical constraint, the constraint that the creek be protected.

From the Introduction, Chapter 1 of the Plan:
"The key natural features of the Clarksburg Study Area are shown in Figure 2. Water-related features are the most prominent. The Study Area lies almost entirely within one watershed (Little Seneca Creek) and includes many streams flowing in a north-south direction. The streams, which flow to Little Seneca Lake, generally have good water

quality; continuing the good health of these streams is a key concern of the Plan." (pg.4, Chapter 1).

From the Chapter 2, Vision for the Future, the Plan lays out 10 key policies that guide the whole 1994 Plan. Given it's placement as policy number 2, the Planning Board and Council placed a very high priority on this one:
"Policy 2 – Natural Environment. This Plan recommends that Clarksburg's natural features, particularly stream valleys, be protected and recommends Ten Mile Creek and Little Seneca Creek be afforded special protection as development proceeds" (pg 18, Chapter 2)

From the next chapter of the Plan comes this proviso:
"This Plan recommends an extensive level of environmental mitigation because all the environmental studies done as part of this Master Plan process have identified Ten Mile Creek as a fragile stream due to its delicate ecosystem, low base flow, and highly erodible stream banks. In this respect, Ten Mile Creek differs from other streams in the Study Area and merits special consideration." (pg 89, Chapter 3).

From the staging chapter of the Plan comes this proviso and requirement for what happens at Stage 4:
"The Plan presents seven guiding staging principles related to critical concerns and opportunities in Clarksburg.....Principle #6: Water Quality Protection. The timing and sequence of development in Clarksburg should respond to the unique environmental qualities of the area and help mitigate, in particular, development impacts to the environmentally sensitive stream valleys in the Ten Mile Creek watershed." (pg 191, Chapter 9).

Stage 4 of the Plan requires "Baseline Monitoring", aka baseline biological assessment, of the aquatic ecosystems of the Little Seneca Creek and Ten Mile Creek watersheds for a minimum of three years to measure and report changes to the biological integrity of the two watersheds. (pg. 197, Chapter 9). An additional trigger for State 4 was to be "Eastside BMP's Monitored and Evaluated: The first Annual Report on the Water Quality Review Process following the release of 2,000 building permits on the Newcut Road and Town Center sub-areas is completed. This report will have evaluated the water quality best management practices (BMPs) and other mitigation techniques associated with Town Center/Newcut Road development and other similar developments in similar watersheds where BMPs have been monitored." (pg. 198, Chapter 9).

What have these studies found? Reasonable question, right? Well, they find that the BMPs mostly operate as engineered BUT there is enough polluted storm water runoff from these areas that the development has actually degraded Little Seneca Creek and its arm of Little Seneca reservoir (see attached picture) DESPITE the best engineering efforts of the developers, the best permitting and oversight efforts of the County's DEP and everyone's expectation that things would turn out for the better.

The 1994 Plan is very clear on what to do after the Eastside BMPs are monitored and evaluated. It says the County Council may:

1. Grant water and sewer category changes without placing limiting conditions on property owners.
2. Grant category changes subject to property owners taking additional measures to protect water quality.
3. Defer action pending further study.
4. ***Consider such other land use actions as are deemed necessary [emphasis added by witness].***
   (paraphrased from pg199, Chapter 9)

Hence, the County Council, and by reference the Planning Board, may decide to recommend any of these courses of action including actions that would change aspects of the 1994 Plan such as density, placement of development, etc. in order to protect the local creeks better than was occurring in the build out of stages 1 to 3. Now is the time for the Planning Board and Council to take those actions which would fully protect Ten Mile Creek and prevent the further decline of Little Seneca reservoir that comes from storm water generated in the previously developed Cabin Branch and Little Seneca watersheds.

Conclusion

When all is said and done, the reason I am here tonight is because you hold in your hands the fate of the LAST, BEST CREEK in Montgomery County. I did say LAST and BEST because Ten Mile Creek is the best one left in Montgomery County after all the development, road building, developer promises about how things would be OK, and clever engineering that never works as well in the real world as promised. And your job as the trusted stewards of our community is to decide the fate of that creek and the quality of our drinking water for decades to come. Our community....Montgomery County and all its citizens.... have entrusted you with the role of Stewardship. Think about your roles as Stewards. You are Stewards for the people, for the community, for the land, and for our environment. Those are very important responsibilities.

So, I ask you this question: Why degrade this creek with 1,000 housing units, an outlet mall, and shopping/office complex when the development is more suited elsewhere? Why rely on unproven water quality prediction models and environmental site design ideas that have never been applied at this scale before and where there are NO, NONE, NOT ONE example of where these techniques have preserved a high quality drinking water source creek before. Why take that risk with the LAST, BEST CREEK in our county? Are you so sure it will work? Is staff positive it will work? Is our last, best creek the right place to run this EXPERIMENT? Really? Aren't we smarter than that?

For you see there is no turning back and fixing the creek after the bulldozers start pushing over the trees, ripping up the soil, blasting through fragile rock to cut roads and building pads. When the sediment starts moving into the creek, when the stream bugs start getting smothered by silt, toasted by the higher temperature water, and flushed out by the increased floods that will come, where will you be? Will you wring your hands and say

we were promised a different outcome? The consultants and the staff and the developers all told us it could be done without damaging the creek too much? Or more absurdly that development would actually improve the creek? That one is a laugh. Where will you be when Little Seneca takes yet another hit in water quality and the WSSC has to backflush its filters more often, turn up the chlorine a little higher because the Potomac has more sediment and organics in it, and your kids ask you why the water tastes and smells so bad?

I hope you will be watching and learning. Thank you for your time.

For Questions, please call:
Michael Gravitz
Mzgravitz@gmail.com
301-351-5052 cell
202-546-5346 work

Source: USGS image via Google Earth taken 4/2008.

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Good evening Madam Chair, Board Members and concerned citizens,

My name is Anne Cinque.
I live at 22300 Slidell Rd.
Boyds, Md

It seems that, almost always, this Board has to make decisions that call upon their role either as stewards of the land OR as speakers for the economic growth of the community.

In a decision to preserve Ten Mile Creek and, hence, the reservoir, there is no such conflict. Just as clear as the need to preserve the purity of the reservoir for ethical and environmental reasons is the need to preserve the purity of the reservoir for the 4.2 million people who depend on it as a back-up for the water supply. There will be no growth if drinking water cannot be guaranteed. The needs of both land and people are one and the same.

Indeed, it was for the welfare of the people that the Planning Board and County Council first created the reservoir. Asking--and receiving--farms and homes from the people of Boyds, the Board and County Council made a strong case for the essential need of the reservoir for the people in this and the Metro Region. Tens of millions of dollars were spent by the County to buy land under and around the Seneca Reservoir. Jill and Jay Chadwick--I spoke with Jill the other day--sold their 700 acre farm, at substantial loss to be used as park land. They felt "it was the right thing to do," said Jill.

Promises were made to, and remembered by, Boyds citizens: They were promised that the streams and creeks and the reservoir would be kept pure in perpetuity. People who are here today--including my husband (president of Boyds Civic Association at the time of the promise) and me, John Menke,(past County Council president), and Anne Sturm, (past Sugarloaf Citizens' Association president) remember that promise. You have letters from other people who remember that promise, among whom are Peg Coleman (long time resident and author of a book on the history of Boyds) . I have spoken to many who remember: Merrit Ednie (Minister of Boyds Presbyterian Church and president of Boyds shortly after the promise), Stan Fischer (president of Boyds Civic Association just before the promise)--among many others.

The significance of the reservoir and the promise was remembered--and honored--by both the Board and County Council. Again, tens of millions of dollars were

spent in the purchase of land west of the creek to preserve the headwaters which flow into Ten Mile Creek and the reservoir. The proposal for a golf course situated on the headwaters of the west side of the creek became Bucklodge Forrest, a county owned park. A proposal for seventeen houses on the headwaters of the west side of the creek was purchased and preserved as conservation parkland.

Tens of millions of dollars have been spent by the county to preserve the purity of headwaters west of Ten Mile Creek. Now there are proposals which would enormously threaten headwaters east of the creek.

What is the difference?

It is obviously impossible to save one half of a flowing creek!

Why were tens of millions of dollars of county money spent buying land to protect the headwaters for the last twenty years?

Why were tens of millions of dollars of county money spent wrenching homes and farms from people living and farming where the reservoir is now situated?

Do you understand why we are perplexed?

This proposal need not cost the county money. The land can be put into the Agricultual Reserve--as proposed by the Park and Planning Board in 1994. There are many alternatives that need not cost the county nearly as much as it has already spent--and could assure the Board's consistency in its role as steward.

The Park and Planning Board and County Council of the early 80's have legacies of having created a reservoir that now serves 4.2 million people.

The Park and Planning Board and County Councils since then have legacies of having preserved and protected the reservoir and the creeks which flow into it.

Their actions have been consistent with their roles as stewards of the land and of the people.

What will be your legacy?

Will your stewardship also defend the land and the people?

Or will your stewardship serve a few developers?

Will your stewardship destroy the visions of the past, the moral--although very difficult and expensive--decisions that have been made in the chairs upon which you sit?

It is impossible for us to imagine that this is a difficult choice.

Thank you very much for the time and gracious attention you have given to this matter.

Anne Cinque

September 10th Testimony on Little Seneca Reservoir

My name is Jay Cinque, I live at 22300 Slidell Rd, Boyds, Md. Thank you for giving me time to speak on this proposed master plan amendment. I recognize that the MNPPC plays two different roles and assumes two different responsibilities in this Master Plan consideration.

In your regulatory role you will be considering such issues as zoning, subdivision design, adequacy of sewer, water transportation etc.

But you also have another role since you own all of the land around and under the Little Seneca Reservoir and you hold that land in Trust for all of citizens in the greater Washington area. You are the Trustee for the Citizens of the greater Washington area. I believe that your role and responsibility as Trustee trumps your role as regulator. It requires a special moral responsibility to all of the people in the greater Washington area. So as you move forward in considering what the development impacts might do to the Little Seneca Reservoir and you hear what has already been happening to the lake and how critical then the protection of Ten Mile Creek becomes I thought it might be helpful to consider what other states and neighboring jurisdictions have already done to protect their water supply for their populations:

Other jurisdictions have embraced stringent measures to protect their drinking water, a vital resource. Measures like these should be adopted for this master plan amendment to preserve Little Seneca reservoir.

Under its long-range plan, New York City is acquiring hundreds of thousands of acres surrounding its reservoirs in the Catskills to provide enough clean drinking water for future generations. Planners recognized that "ownership of land ensures that crucial natural areas remain undeveloped, while eliminating the threat from more damaging uses" to the watersheds. Also, the City found that land acquisition costs less than constructing and operating new filtration plants. This course is prudent, too. New York anticipates its population doubling by 2030 and will need to provide enough drinking water for all.
http://www.nyc.gov/html/planyc2030/html/theplan/watersupply.shtml

Similarly, the State of New Jersey, has set aside 415,000 acres in the Highlands as a Preservation Area for several reservoirs. Their watersheds were being fragmented and lost to rapid development, while surface and ground waters were being depleted. A regional master plan now protects large areas of contiguous forest; steep slopes, including those with shallow and erodible soils; critical habitat areas; riparian buffers; and groundwater recharge areas. Development is limited to pre-existing uses; deforestation is prohibited; and impaired forests are to be restored. A 300-foot riparian buffer has been prescribed for all water resources, which can be expanded to protect critical habitats and steep slopes.
http://www.highlands.state.nj.us/njhighlands/master/rmp/final/highlands_rmp_112008.pdf

Zoning can also be used to protect drinking water. Baltimore County has placed most of its 3 reservoirs and their watersheds

outside an Urban-Rural Demarcation Line in an area similar to Montgomery County's Agricultural Reserve, except that the minimum lot size is 50 acres. The reservoirs are further protected by large tracts of forested land, county and state parks, and conservation easements.
http://resources.baltimorecountymd.gov/Documents/Planning/masterplan/mp2020/fsustainenvironment.pdf

Planning tools like these, if applied to the Ten Mile Creek watershed, would go a long way toward protecting the Little Seneca reservoir for the 4.2 million people who depend on it. Development should be prohibited in all areas of high resource value identified by the environmental consultants -- steep slopes; erodible soils; hydric soils; forests and interior forests; 100-year floodplains; perennial and intermittent streams; ephemeral channels; wetlands; springs, seeps, and seasonal ponds –all should be protected not just some of them. As New Jersey has done, much wider riparian buffers should be adopted to protect streams, springs, wetlands, seasonal ponds, and floodplains. Building on steep slopes, especially those with shallow or erodible soils should be prohibited. Areas could be designated for reforestation to stabilize the watershed. Both the east and west sides of the Ten Mile Creek watershed should be put in the Agricultural Reserve, as the Planning Board recommended in 1993 when considering the Clarksburg Master Plan. Rural zoning is the approach Baltimore County has taken to protect its reservoirs. Montgomery County could also establish an environmental preservation zone in which development is prohibited on lands containing natural resources of high value, such as all streams, springs, seeps, pools, wetlands, floodplains, forests, interior forests, and steep slopes; limit new development

to areas outside the preservation zone. I urge you to adopt these measures in order to truly protect our drinking water.

Call from Louise Lees regarding Ten Mile Creek on 8/26/13

Lees expresses sentiments against the proposed development near Ten Mile Creek. She stated that Ten Mile Creek is fragile and functions as an important water supply that will be greatly impacted by the 100+ acres of hard surface. Lees explained that we should not trust builders to uphold environmental commitments or to protect the creek and water supply.

Lees strongly appeals to the board not to go ahead on the project.

Louise Lees can be reached at her phone: 301-933-1039

R. Scott Fosler
4104 Woodbine Street
Chevy Chase, Maryland 20815
September 10, 2013

Chair Françoise Carrier
Montgomery County Planning Board
8787 Georgia Avenue
Silver Spring, MD 20910.

Re: Clarksburg Limited Master Plan for the Ten Mile Creek Watershed: Impact on Little Seneca Reservoir

Dear Chair Carrier and Members of the Planning Board,

I would like to address the Clarksburg Limited Amendment to the Clarksburg Master Plan, which focuses on the Ten Mile Creek Area, with particular reference to its potential impact on Little Seneca Reservoir.

My key concern here is that the impact on Little Seneca Reservoir has not been sufficiently considered, and that failure to do so could have serious consequences for the water supply of Montgomery County and the entire Washington region.

John Menke has researched this issue and concluded, as he will present to you in testimony, that developing Clarksburg as proposed may damage Little Seneca Reservoir to an unknown degree, with no feasible remedies available. Assessments have shown that degradation of water quality in the reservoir (as indicated by levels of dissolved oxygen, for instance) is greater at the east end of the lake in the Little Seneca Creek sub-basin where it is apparently related primarily to development. Water quality is higher at the west end of the lake which is fed by the Ten Mile Creek sub-basin, which could be seriously compromised by proposed development.

I share Mr. Menke's concerns, and am especially troubled that Little Seneca Reservoir, which is not included in the formal planning area for this proposal, is not being given the consideration it requires as the major emergency water supply for Montgomery County and the entire National Capital Region, with further implications for the Potomac River and Chesapeake Bay watersheds. Let me provide some background which I hope can underscore the importance and nature of this vital regional resource, and then suggest some implications for policy going forward.

BACKGROUND

In the 1960s, the National Capital Region, along with the entire northeast United States, suffered one of the longest and deepest droughts in its recorded history. In response, Congress commissioned the U. S. Army Corps of Engineers to undertake the

Northeastern United States Water Supply (NEWS) Study which proposed long range plans to meet the water supply needs for the entire northeastern part of our country.

The NEWS Study included the Washington Metropolitan Area as one of the critical urban water supply systems, both because it was vulnerable to short-term water supply deficits, and because it was unique in being "river-dependent," taking nearly all of its supply from the Potomac without the kinds of storage and transmission systems typical of other large urban centers such as Boston and New York City.

To remedy these problems, the Corps of Engineers proposed 16 major reservoirs to meet the needs of the Potomac River basin for a fifty year planning period then extending to 2010. The projected costs of the Corps' proposal were substantial. In addition to the financial cost, the 16 major reservoir systems would have inundated vast areas of the Potomac basin, causing, by the Corps' own assessment: "ecologic alteration at the project sites; disruption of cultural and socio-economic patterns; and the diminishing open space and unique wilderness recreational opportunities." The Corps also acknowledged that the upper estuary of the Potomac was not at that time thought of as a prime recreational or esthetic resource, but only as a source of water for the Washington Metropolitan Area.

In the early 1980s, as president of the Montgomery County Council, I got together on this issue with my counterparts who headed the legislative bodies in the other principal jurisdictions in the National Capital Region that depended on the Potomac River for their water supplies, including Prince George's County, Fairfax County, and the District of Columbia. Working through the good offices of the Metropolitan Washington Council of Governments (MWCOG), we tried to see if together we could develop a way of meeting the region's water supply needs in a more efficient and less environmentally damaging manner. We concluded that we could.

With a coordinated system of interconnections and mutual backup, it turned out the major jurisdictions in the Washington region would be able to meet the Potomac's low-flow requirements with just two reservoirs, as opposed to the 16 proposed by the Corps, in order to augment flows during droughts. The Jennings Randolph Reservoir (which straddles the Maryland-West Virginia border) was to provide the main backup in volume, storing some 13 billion gallons of water. But because it was in the upper reaches of the Potomac River Basin, the water released from that reservoir required 7-9 days before reaching the Washington region and the intakes for the major water supply agencies. Little Seneca Lake Reservoir would be smaller, with some 4 billion gallons of storage, but because it was located in Montgomery County it could more quickly augment the flow in the Potomac to reach the intakes, and thus would be the main backup in proximity.

The solution we negotiated on a regional basis became the Water Supply Coordination Agreement (WSCA) of 1982, formally signed by the region's major water utilities, including the Washington Suburban Sanitary Commission (WSSC), the Fairfax County Water Authority (FCWA), and the Washington Aqueduct Division of the U.S. Army Corps of Engineers (WAD), which provides raw water to the District of Columbia,

Arlington County, Falls Church, and part of Fairfax County, as well as the Interstate Commission on the Potomac River Basin (ICPRB). (The three supply agencies together accounted then and now for about 95 percent of the water drawn from the Potomac for the region). The WSCA was directed at coordinating the region's water utilities during droughts in a way that would minimize the possibility of having to implement the restrictive stages of the Low Flow Allocation Agreement (LFAA), which had been signed in 1978 by those same signatories (plus the states) in order to maintain adequate flow in the Potomac River during droughts.

WHAT'S AT STAKE?

Based on this background and the circumstances we face now and are likely to face in the future, let me summarize five key points that I believe are at stake here:

First, Little Seneca Reservoir is the principal emergency water supply for Montgomery County. If it is slowly degraded over time, it will not be there when we need it. Moreover, while Little Seneca's current emergency value is that it can quickly augment Potomac flows during droughts, it might also serve another critical emergency function that has gotten less attention than it deserves. With appropriate new connections directly into the WSSC system, Little Seneca might provide a direct backup to Montgomery County and Prince George's water users in the event of (another) failure in the Potomac Filtration Plants. But if the turbidity of the reservoir is permitted to deteriorate further, such an emergency backup would not work without a major new filtration system.

Second, Little Seneca Reservoir is the main proximate emergency water supply for the entire Washington metropolitan area. Montgomery County has a major responsibility to protect Little Seneca Reservoir not just for its own citizens, but for the citizens of the entire National Capital Region. Incidentally, while the two-reservoir/inter-jurisdictional water supply coordination solution of 1982 was far less costly than the 16 reservoir solution proposed by the Corps of Engineers, the investment made in the Little Seneca Reservoir should not be underestimated or forgotten. In addition to the financial cost, they include the loss of a Ten Mile Creek stream valley and habitat, as well as the time and cost required to undertake numerous regional studies and agreements over the years, dating back to the BiCounty Water Supply Task Force in 1977 and right up to the present.

Third, Little Seneca Reservoir should be seen in the even broader context of the Potomac River and Chesapeake Bay watersheds. Recall that this reservoir was pivotal to a water supply plan that began by considering the entire northeastern United States, and was vital in considering the overall health and future of the Potomac basin, and of the Chesapeake watershed of which the Potomac forms a critical part. The only way in which those broader ecosystems will be repaired and protected is if each jurisdiction within them takes seriously their particular stewardship responsibilities. And Montgomery County's responsibility for the health of Little Seneca Reservoir could not be more critical in that regard.

Fourth, Montgomery County's regional stewardship for Little Seneca Reservoir involves not just the well-being of the resource itself, but also of the trust and credibility that is vital to regional cooperation. It is not just the vital tangible resource of a particular reservoir that is at stake here, but also intangible resources of trust, credibility and a tradition of regional cooperation required to undertake other joint regional projects, including the many serious challenges we see on the horizon that can only be addressed on a regional basis. If our regional neighbors can't trust us with their water supply, what can they trust us with?

Fifth, the capacity of our county and the Washington region to continue to exercise local and regional autonomy with regard to our water supply depends on our ability to live up to the responsibilities we have already taken on as a county and as a region for such critical assets as Little Seneca Reservoir. Recall that following the severe droughts of the 1960s, the federal government was prepared to step in and essentially take over the responsibility for assuring an adequate water supply for the entire National Capital Region, proposing a plan that would have had huge financial and environmental costs for our region and the broader Potomac and Chesapeake watersheds. Our county, in conjunction with our regional neighbors, said to the federal government on this occasion: thanks for your concern, but we can handle this pretty much on our own. Now we need to demonstrate that we were serious, and that we can.

Given all these considerations, the bottom line at the moment seems clear, as Mr. Menke has already stated it: Before proceeding with the next phase of Clarksburg, there should be a major study and policy discussion about Little Seneca Reservoir so that we can be certain we know precisely what we are doing.

Thank you for your consideration.

Sincerely,

R. Scott Fosler

Clarksburg Plan Amendment

Little Seneca Reservoir (LSR)—the forgotten child

John Menke

September 10, 2013

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Clarksburg Plan Amendment Stage 4 depends on:

Mass transit to Clarksburg

But there is none

Evaluation of effect of development on Ten Mile Creek (TMC)

But there is little proof of efficacy of WQ measures

But worse: Plan Amendment does not consider effect on Little Seneca Reservoir (LSR)

If Clarksburg development degrades LSR, we lose vital asset for the entire Washington region

What is purpose of LSR?

Supplement low flow in Potomac

Possible emergency backup for Potomac Filtration Plant (PFP)

Recreation facility

LSR is Regional Asset: We must take care of it

Caring for TMC is necessary—but NOT sufficient

Huge investment in LSR:

Destroyed beautiful TMC stream valley

Loss of habitat, expenditure of money

Numerous Agreements covering LSR

Multiple players (MWCOG, MC Govt, MNCPPC, WSSC, ICPRB)

Decades of work (BiCounty Water Supply Task Force in 1977)

Do we risk trashing this investment?

Data will show

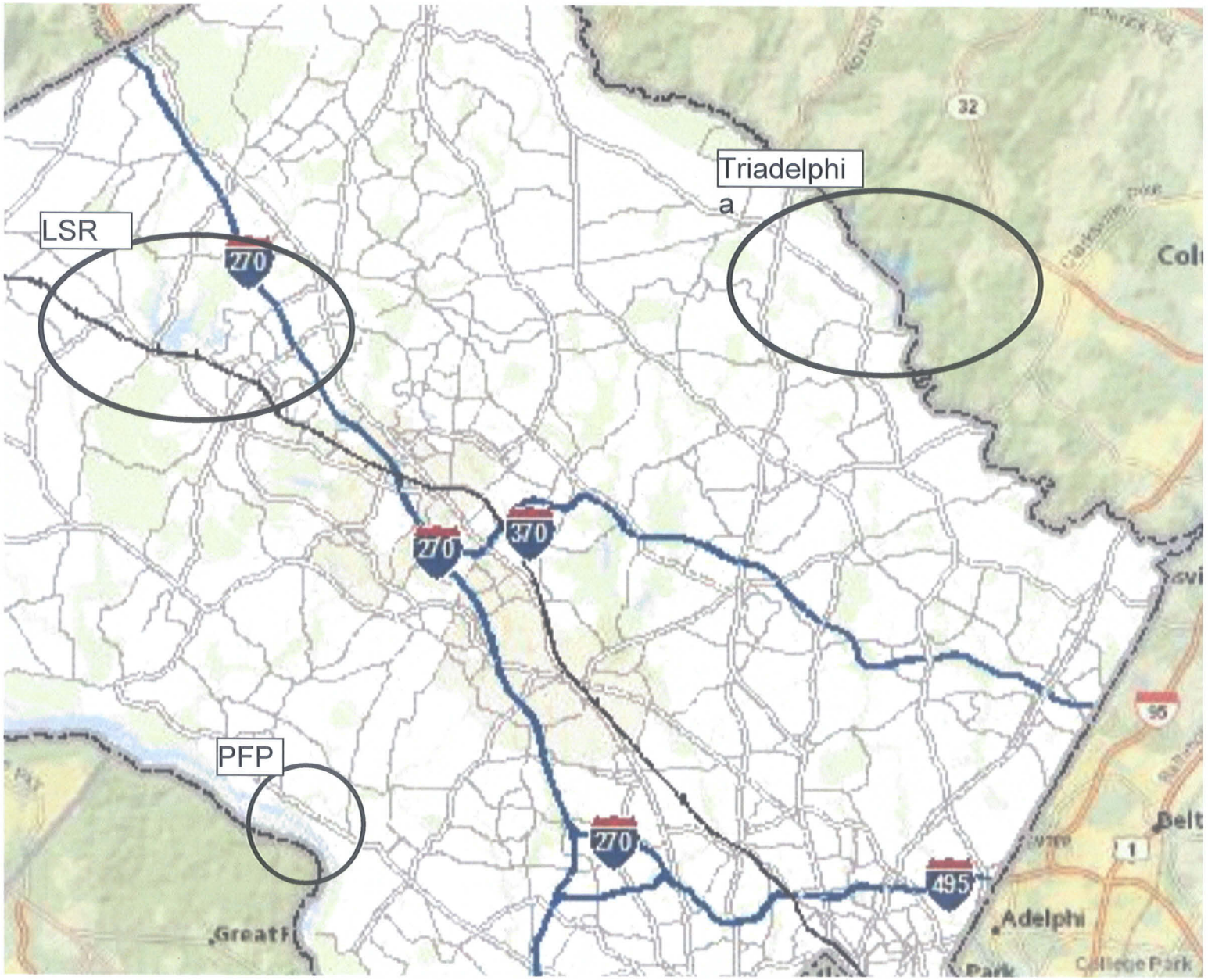
LSR quality is already compromised with clear indications that development is harming LSR

The part of LSR (low development) near TMC (west) is cleanest

The part of LSR (high development) near LSC (east) is dirtiest

Systems to protect the Lake have NOT been demonstrated to work!

We no longer test chemicals on animals, why should we test WQ controls on a drinking water reservoir?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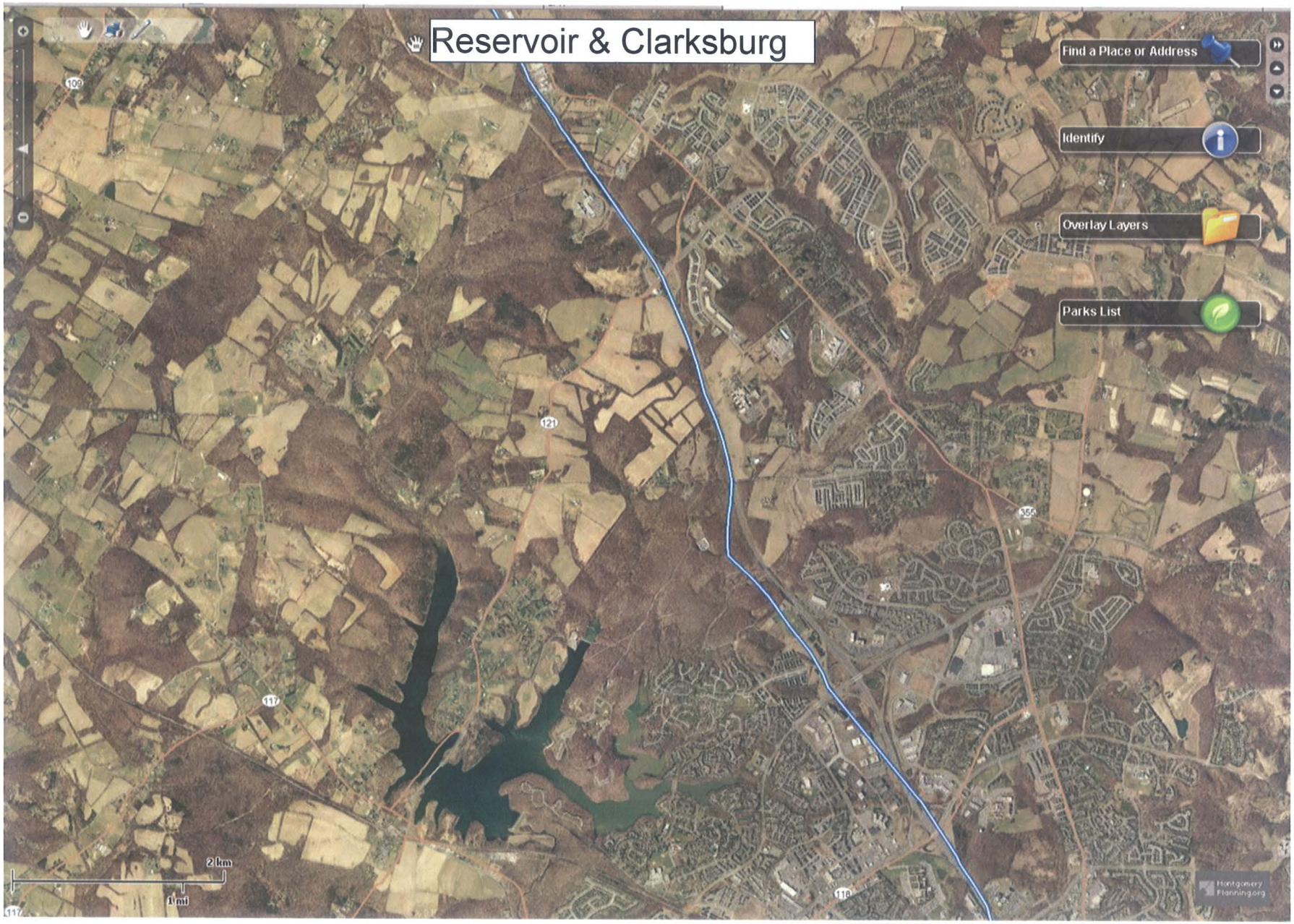
Reservoir & Clarksburg
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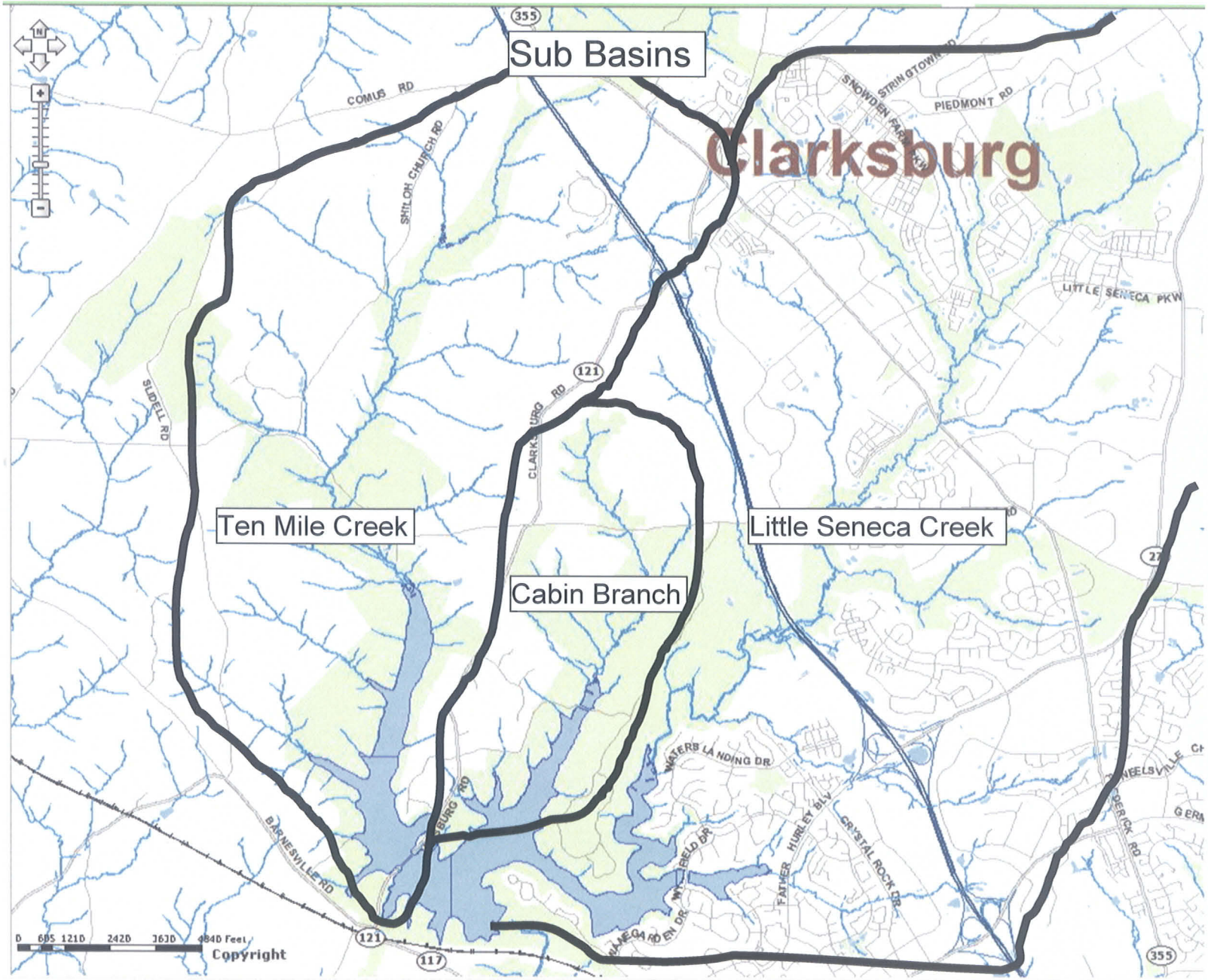
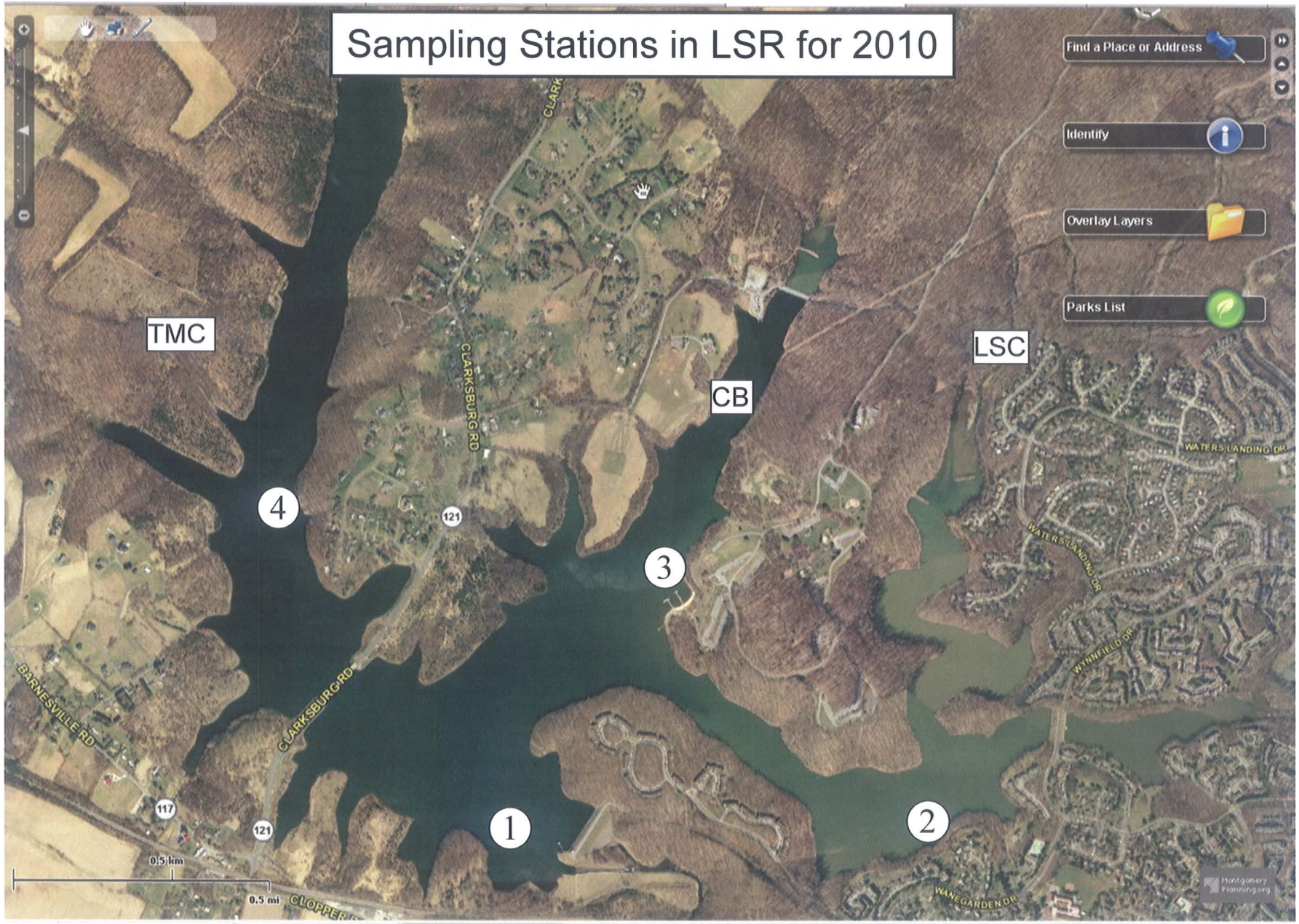

Sub Basins
Clarksburg
Ten Mile Creek
Cabin Branch
Little Seneca Creek
COMUS RD
SHILOH CHURCH RD
SLIDELL RD
CLARKSBURG RD
PIEDMONT RD
LITTLE SENECA PKWY
BARNESVILLE RD
355
121
117
Copyright


Sampling Stations in LSR for 2010
Find a Place or Address
Identify
Overlay Layers
Parks List
TMC
CB
LSC
4
3
2
1
CLARKSBURG RD
BARNESVILLE RD
WATERS LANDING DR
WYNNFIELD DR
WANEGARDEN DR
117
121
0.5 km
0.5 mi
Montgomery Planning.org

Many measures of water quality…

One indicator is Dissolved Oxygen (DO) (High is good, Low is bad)

<2ppm is anoxic, most animals don't survive

2-5ppm is intermediate

>5ppm is high in oxygen, good for life

Generally sample different places, depths, seasons

WSSC samples in Triadelphia, Rocky Gorge, and LSR

Show sample results from Patuxent Lakes as reference…

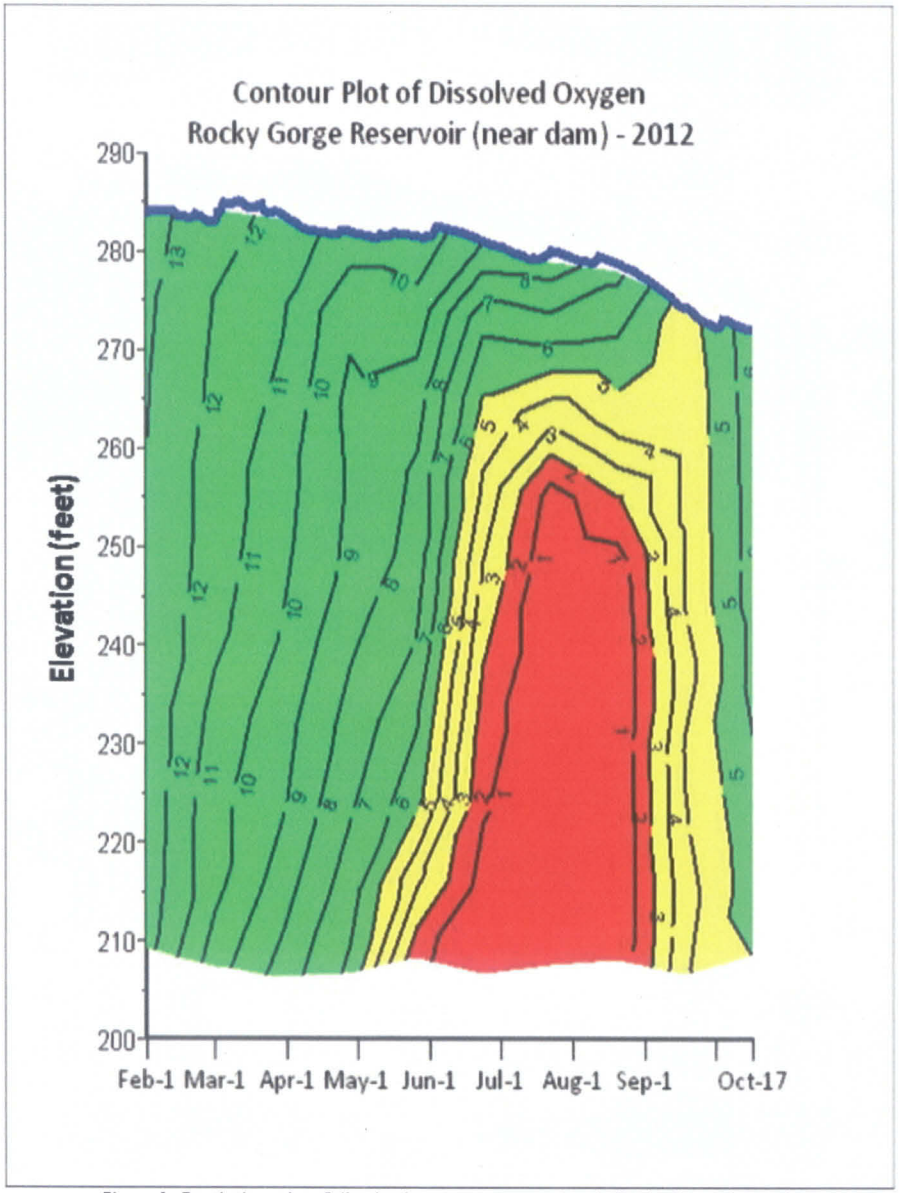


Figure 4. Depth-time plot of dissolved oxygen concentrations in Rocky Gorge Reservoir

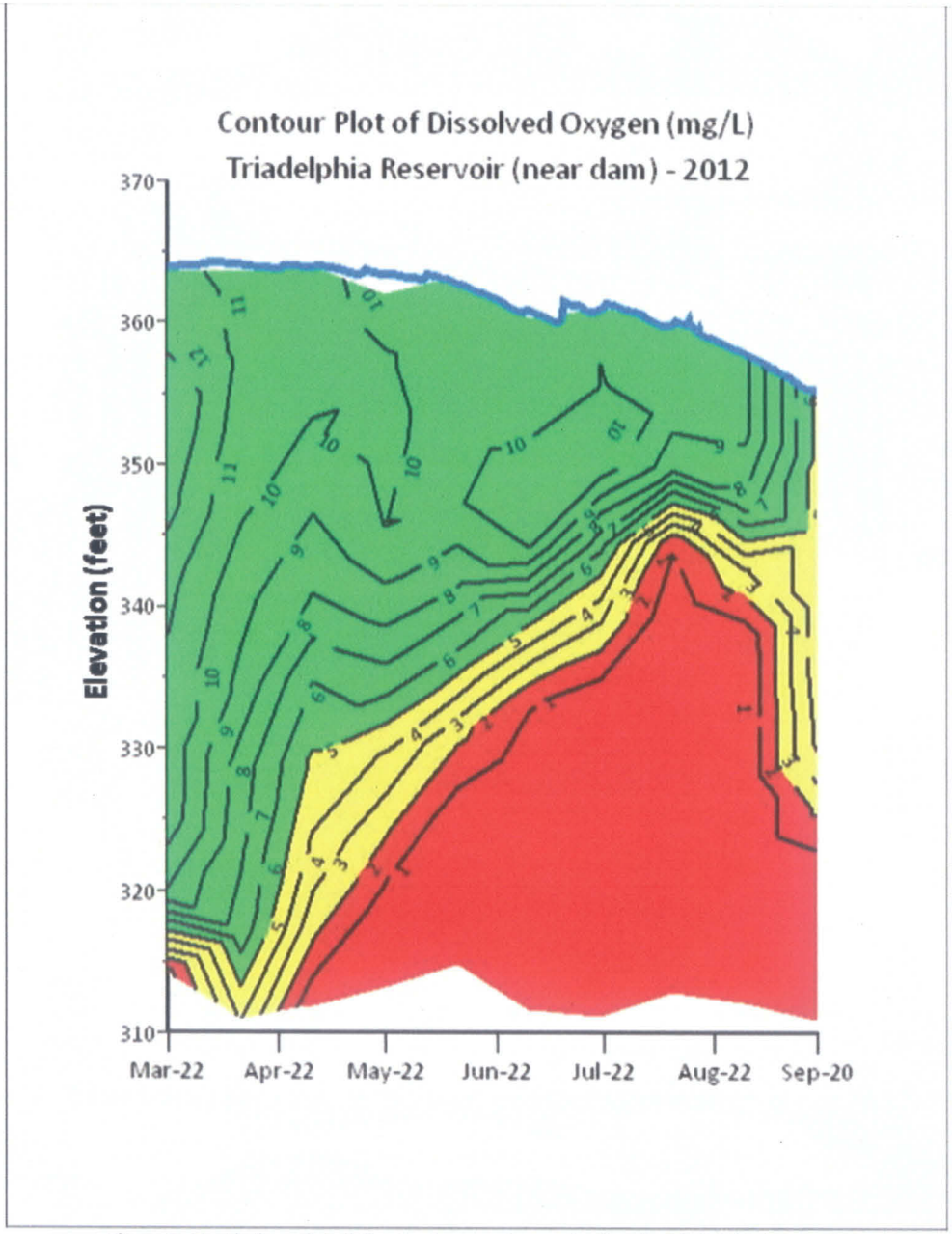


Figure 5. Depth-time plot of dissolved oxygen concentrations in Triadelphia Reservoir

Sampling in LSR more limited, and presented in different graphs

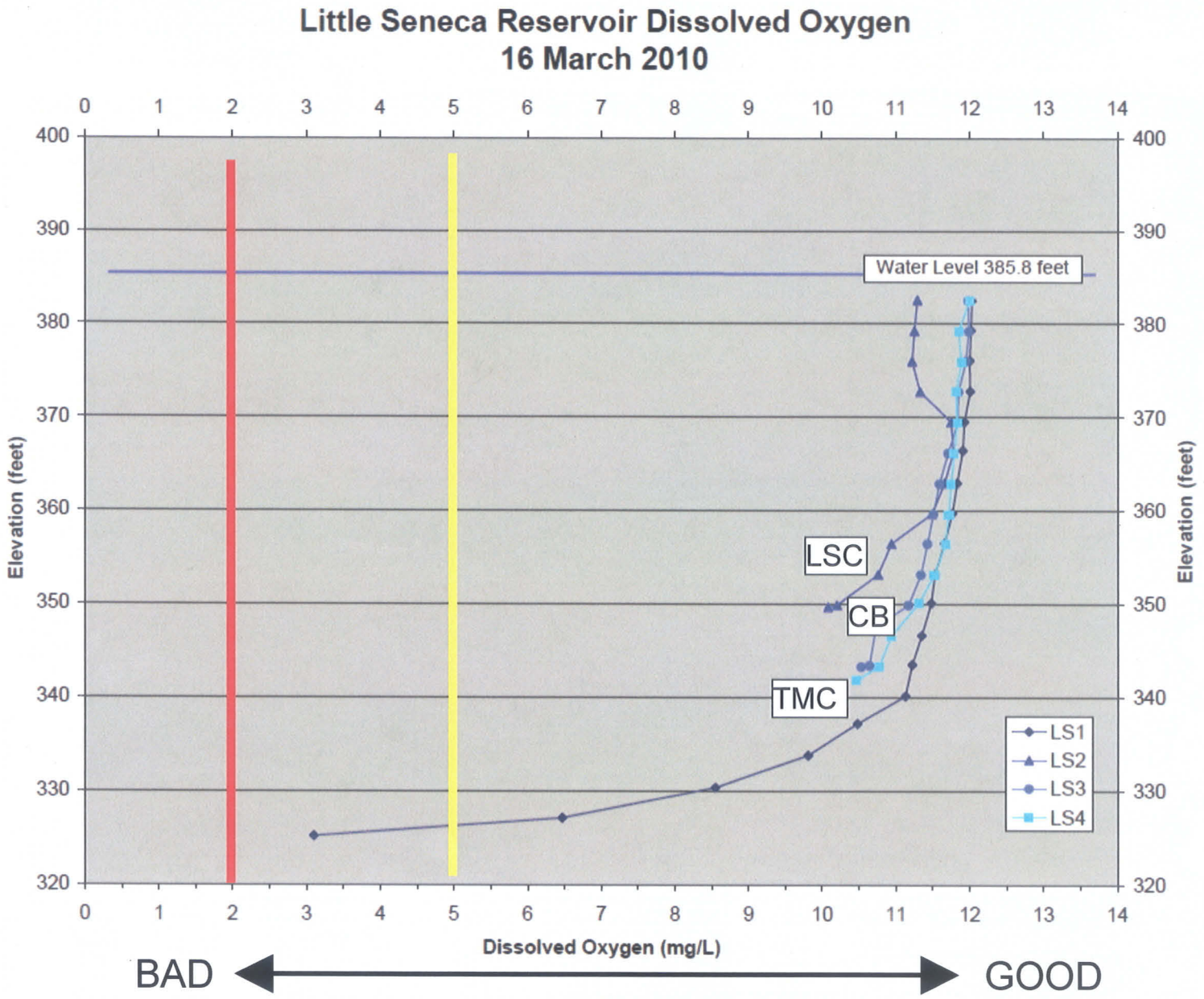
Each LSR graph is one day, but all four sample stations

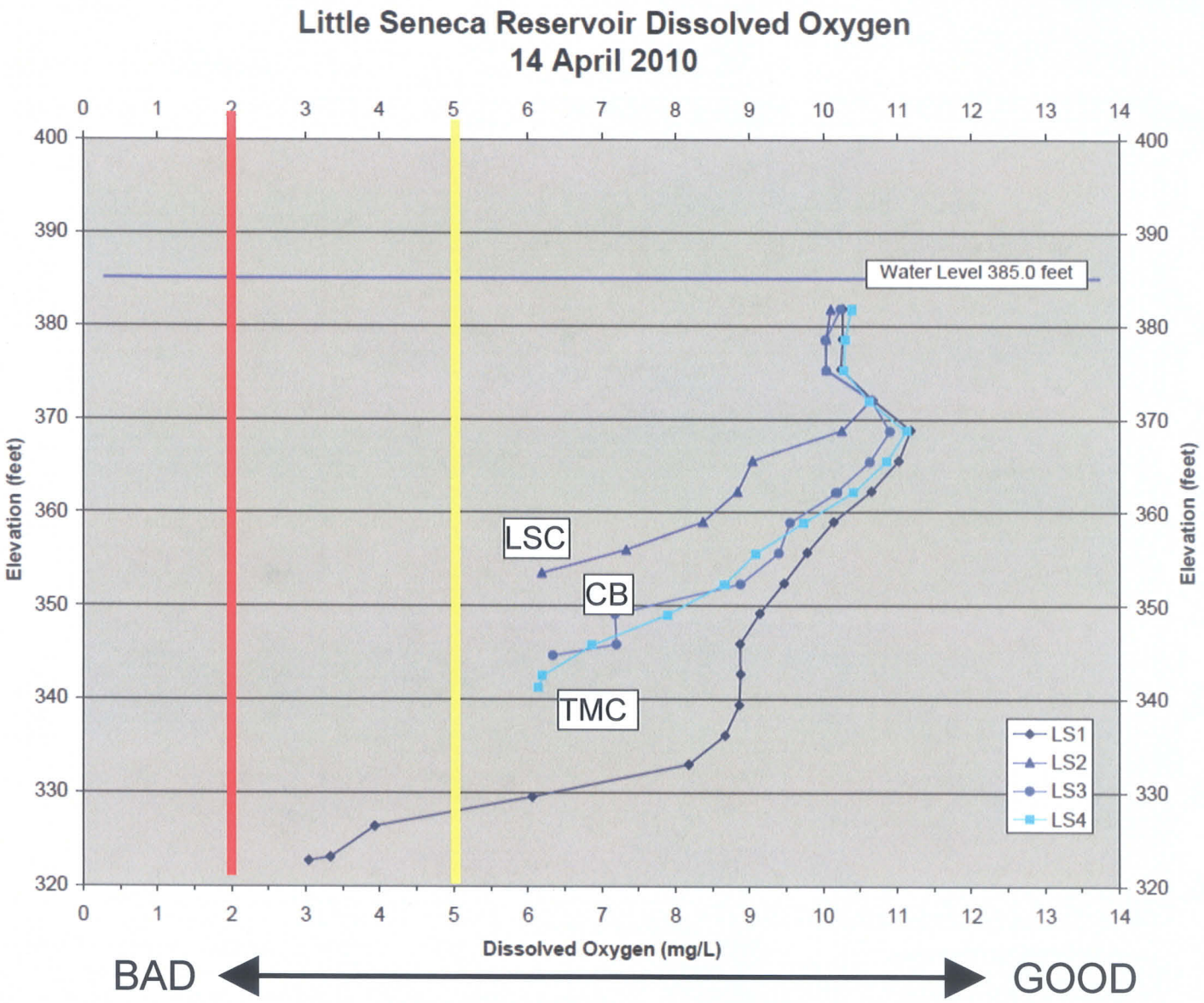
Red and Yellow lines show the 2 and 5 ppm for reference

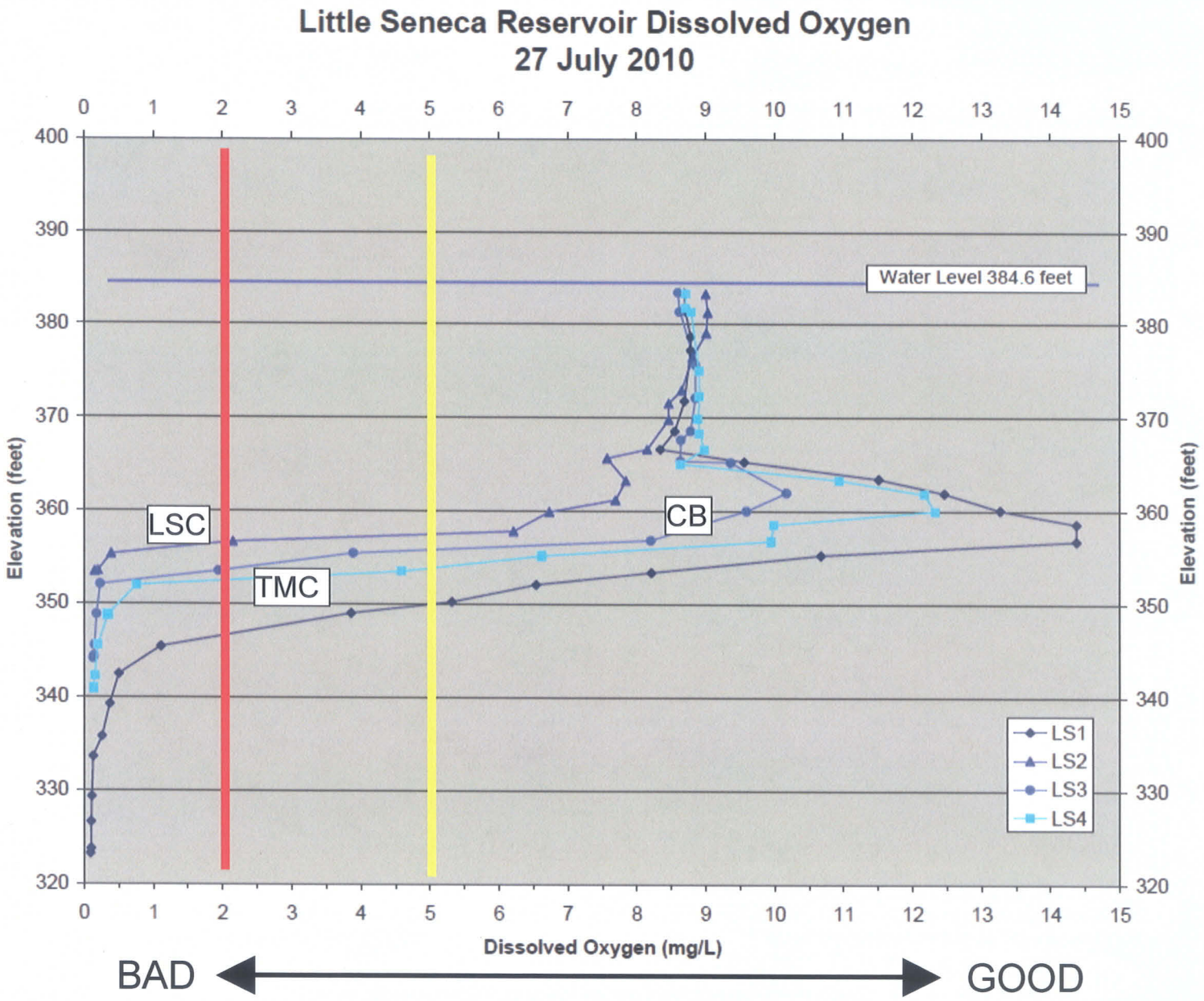
Note X-axis is zero on left (bad), increases to right (good)

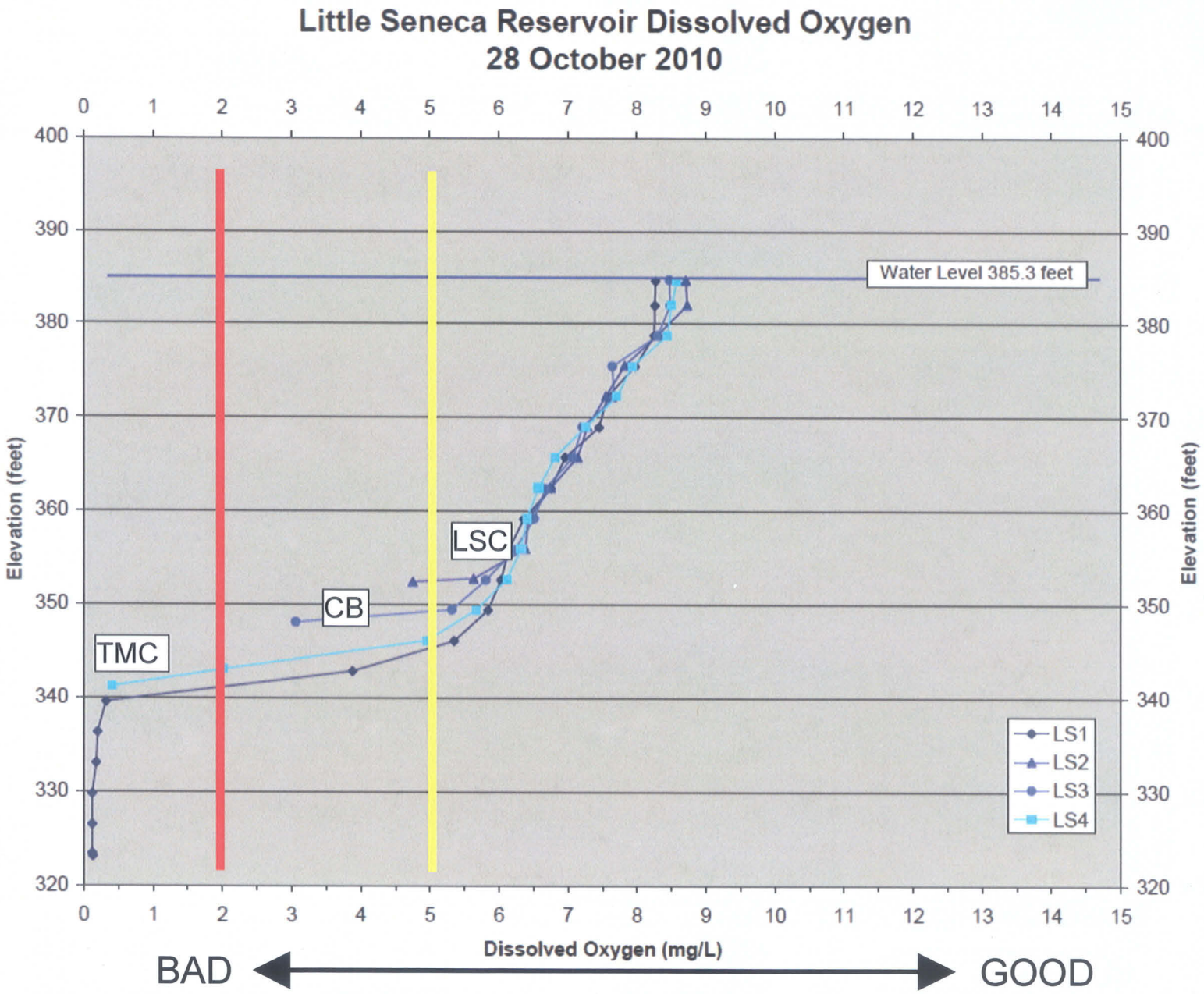
Y-axis shows depth below water surface

Longest line on graph is station next to dam (deepest)


Little Seneca Reservoir Dissolved Oxygen
16 March 2010
Water Level 385.8 feet
LSC
CB
TMC
LS1
LS2
LS3
LS4
Elevation (feet)
Dissolved Oxygen (mg/L)
BAD
GOOD


Little Seneca Reservoir Dissolved Oxygen
14 April 2010
Water Level 385.0 feet
LSC
CB
TMC
LS1
LS2
LS3
LS4
Elevation (feet)
Dissolved Oxygen (mg/L)
BAD
GOOD


Little Seneca Reservoir Dissolved Oxygen
27 July 2010
Water Level 384.6 feet
LSC
TMC
CB
LS1
LS2
LS3
LS4
Elevation (feet)
Dissolved Oxygen (mg/L)
BAD
GOOD


Little Seneca Reservoir Dissolved Oxygen
28 October 2010
Water Level 385.3 feet
TMC
CB
LSC
LS1
LS2
LS3
LS4
Elevation (feet)
Dissolved Oxygen (mg/L)
BAD
GOOD

Conclusions

LSR water quality is not all that great

Water at East end of LSR clearly degraded worse than west

Degradation appears related primarily to development

Developing Clarksburg may damage LSR to an unknown degree, with no feasible remedies available

Before proceeding with next phase of Clarksburg, there should be a major study and policy discussion about LSR: What we are doing?

MCP-CTRACK

From:	ScottFosler@aol.com
Sent:	Tuesday, September 10, 2013 3:41 PM
To:	MCP-Chair
Cc:	rfosler@umd.edu
Subject:	Clarksburg, Ten Mile Creek & Little Seneca Reservoir
Attachments:	Fosler to MCPB Re Clarksburg-Seneca 2013-9-10.doc

Hi Françoise,

Attached is a letter to you and the Montgomery County Planning Board regarding the implications of the Clarksburg plan and Ten Mile Creek for Little Seneca Reservoir.

Best regards,
Scott Fosler

R. Scott Fosler
4104 Woodbine Street
Chevy Chase, Maryland 20815
September 10, 2013

Chair Françoise Carrier
Montgomery County Planning Board
8787 Georgia Avenue
Silver Spring, MD 20910.

Re: Clarksburg Limited Master Plan for the Ten Mile Creek Watershed: Impact on Little Seneca Reservoir

Dear Chair Carrier and Members of the Planning Board,

I would like to address the Clarksburg Limited Amendment to the Clarksburg Master Plan, which focuses on the Ten Mile Creek Area, with particular reference to its potential impact on Little Seneca Reservoir.

My key concern here is that the impact on Little Seneca Reservoir has not been sufficiently considered, and that failure to do so could have serious consequences for the water supply of Montgomery County and the entire Washington region.

John Menke has researched this issue and concluded, as he will present to you in testimony, that developing Clarksburg as proposed may damage Little Seneca Reservoir to an unknown degree, with no feasible remedies available. Assessments have shown that degradation of water quality in the reservoir (as indicated by levels of dissolved oxygen, for instance) is greater at the east end of the lake in the Little Seneca Creek sub-basin where it is apparently related primarily to development. Water quality is higher at the west end of the lake which is fed by the Ten Mile Creek sub-basin, which could be seriously compromised by proposed development.

I share Mr. Menke's concerns, and am especially troubled that Little Seneca Reservoir, which is not included in the formal planning area for this proposal, is not being given the consideration it requires as the major emergency water supply for Montgomery County and the entire National Capital Region, with further implications for the Potomac River and Chesapeake Bay watersheds. Let me provide some background which I hope can underscore the importance and nature of this vital regional resource, and then suggest some implications for policy going forward.

BACKGROUND

In the 1960s, the National Capital Region, along with the entire northeast United States, suffered one of the longest and deepest droughts in its recorded history. In response, Congress commissioned the U. S. Army Corps of Engineers to undertake the

Northeastern United States Water Supply (NEWS) Study which proposed long range plans to meet the water supply needs for the entire northeastern part of our country.

The NEWS Study included the Washington Metropolitan Area as one of the critical urban water supply systems, both because it was vulnerable to short-term water supply deficits, and because it was unique in being "river-dependent," taking nearly all of its supply from the Potomac without the kinds of storage and transmission systems typical of other large urban centers such as Boston and New York City.

To remedy these problems, the Corps of Engineers proposed 16 major reservoirs to meet the needs of the Potomac River basin for a fifty year planning period then extending to 2010. The projected costs of the Corps' proposal were substantial. In addition to the financial cost, the 16 major reservoir systems would have inundated vast areas of the Potomac basin, causing, by the Corps' own assessment: "ecologic alteration at the project sites; disruption of cultural and socio-economic patterns; and the diminishing open space and unique wilderness recreational opportunities." The Corps also acknowledged that the upper estuary of the Potomac was not at that time thought of as a prime recreational or esthetic resource, but only as a source of water for the Washington Metropolitan Area.

In the early 1980s, as president of the Montgomery County Council, I got together on this issue with my counterparts who headed the legislative bodies in the other principal jurisdictions in the National Capital Region that depended on the Potomac River for their water supplies, including Prince George's County, Fairfax County, and the District of Columbia. Working through the good offices of the Metropolitan Washington Council of Governments (MWCOG), we tried to see if together we could develop a way of meeting the region's water supply needs in a more efficient and less environmentally damaging manner. We concluded that we could.

With a coordinated system of interconnections and mutual backup, it turned out the major jurisdictions in the Washington region would be able to meet the Potomac's low-flow requirements with just two reservoirs, as opposed to the 16 proposed by the Corps, in order to augment flows during droughts. The Jennings Randolph Reservoir (which straddles the Maryland-West Virginia border) was to provide the main backup in volume, storing some 13 billion gallons of water. But because it was in the upper reaches of the Potomac River Basin, the water released from that reservoir required 7-9 days before reaching the Washington region and the intakes for the major water supply agencies. Little Seneca Lake Reservoir would be smaller, with some 4 billion gallons of storage, but because it was located in Montgomery County it could more quickly augment the flow in the Potomac to reach the intakes, and thus would be the main backup in proximity.

The solution we negotiated on a regional basis became the Water Supply Coordination Agreement (WSCA) of 1982, formally signed by the region's major water utilities, including the Washington Suburban Sanitary Commission (WSSC), the Fairfax County Water Authority (FCWA), and the Washington Aqueduct Division of the U.S. Army Corps of Engineers (WAD), which provides raw water to the District of Columbia,

Arlington County, Falls Church, and part of Fairfax County, as well as the Interstate Commission on the Potomac River Basin (ICPRB). (The three supply agencies together accounted then and now for about 95 percent of the water drawn from the Potomac for the region). The WSCA was directed at coordinating the region's water utilities during droughts in a way that would minimize the possibility of having to implement the restrictive stages of the Low Flow Allocation Agreement (LFAA), which had been signed in 1978 by those same signatories (plus the states) in order to maintain adequate flow in the Potomac River during droughts.

WHAT'S AT STAKE?

Based on this background and the circumstances we face now and are likely to face in the future, let me summarize five key points that I believe are at stake here:

First, Little Seneca Reservoir is the principal emergency water supply for Montgomery County. If it is slowly degraded over time, it will not be there when we need it. Moreover, while Little Seneca's current emergency value is that it can quickly augment Potomac flows during droughts, it might also serve another critical emergency function that has gotten less attention than it deserves. With appropriate new connections directly into the WSSC system, Little Seneca might provide a direct backup to Montgomery County and Prince George's water users in the event of (another) failure in the Potomac Filtration Plants. But if the turbidity of the reservoir is permitted to deteriorate further, such an emergency backup would not work without a major new filtration system.

Second, Little Seneca Reservoir is the main proximate emergency water supply for the entire Washington metropolitan area. Montgomery County has a major responsibility to protect Little Seneca Reservoir not just for its own citizens, but for the citizens of the entire National Capital Region. Incidentally, while the two-reservoir/inter-jurisdictional water supply coordination solution of 1982 was far less costly than the 16 reservoir solution proposed by the Corps of Engineers, the investment made in the Little Seneca Reservoir should not be underestimated or forgotten. In addition to the financial cost, they include the loss of a Ten Mile Creek stream valley and habitat, as well as the time and cost required to undertake numerous regional studies and agreements over the years, dating back to the BiCounty Water Supply Task Force in 1977 and right up to the present.

Third, Little Seneca Reservoir should be seen in the even broader context of the Potomac River and Chesapeake Bay watersheds. Recall that this reservoir was pivotal to a water supply plan that began by considering the entire northeastern United States, and was vital in considering the overall health and future of the Potomac basin, and of the Chesapeake watershed of which the Potomac forms a critical part. The only way in which those broader ecosystems will be repaired and protected is if each jurisdiction within them takes seriously their particular stewardship responsibilities. And Montgomery County's responsibility for the health of Little Seneca Reservoir could not be more critical in that regard.

Fourth, Montgomery County's regional stewardship for Little Seneca Reservoir involves not just the well-being of the resource itself, but also of the trust and credibility that is vital to regional cooperation. It is not just the vital tangible resource of a particular reservoir that is at stake here, but also intangible resources of trust, credibility and a tradition of regional cooperation required to undertake other joint regional projects, including the many serious challenges we see on the horizon that can only be addressed on a regional basis. If our regional neighbors can't trust us with their water supply, what can they trust us with?

Fifth, the capacity of our county and the Washington region to continue to exercise local and regional autonomy with regard to our water supply depends on our ability to live up to the responsibilities we have already taken on as a county and as a region for such critical assets as Little Seneca Reservoir. Recall that following the severe droughts of the 1960s, the federal government was prepared to step in and essentially take over the responsibility for assuring an adequate water supply for the entire National Capital Region, proposing a plan that would have had huge financial and environmental costs for our region and the broader Potomac and Chesapeake watersheds. Our county, in conjunction with our regional neighbors, said to the federal government on this occasion: thanks for your concern, but we can handle this pretty much on our own. Now we need to demonstrate that we were serious, and that we can.

Given all these considerations, the bottom line at the moment seems clear, as Mr. Menke has already stated it: Before proceeding with the next phase of Clarksburg, there should be a major study and policy discussion about Little Seneca Reservoir so that we can be certain we know precisely what we are doing.

Thank you for your consideration.

Sincerely,

R. Scott Fosler

MCP-CTRACK

From: Diane Cameron <dianecameron60@gmail.com>
Sent: Friday, September 13, 2013 4:27 PM
To: MCP-Chair
Subject: Additional items for and comments on the Hearing Draft of the Ten Mile Creek Area Limited Amendment.
Attachments: SWM Regs Consortium letter 01 05 09.pdf; Ten Mile Creek – protecting our drinking water supply based on real-world data_Cameron_9.2013.pdf

Dear Chair Carrier, Commissioners and Staff,

Please accept the attached items and few additional comments below, as part of my testimony on the Ten Mile Creek Area Limited Master Plan Amendment.

(1) A 2009 letter to the Maryland Department of the Environment on behalf of members of the Maryland Stormwater Consortium. I referred to this letter in my testimony at the Planning Board hearing on this Limited Amendment on September 10, 2013. This letter details how in several key respects, MDE's Environmental Site Design regulations did not adequately reflect the science of "woods in good condition," including that MDE short-shrifted the total required volumes of runoff to be addressed by ESD practices and site plans, and that the agency also relied on highly-flawed Hydrologic Soil Group assumptions that failed to reflect the published science about how woods in good condition in the Maryland Piedmont absorb precipitation.

This letter including its attachment on pp.16-19 refutes the claims by developers about the efficacy of ESD practices; these claims are unfounded in part because they fail to take into account the many flaws and inadequacies of MDE's ESD rules. The Maryland General Assembly in 2007 enacted a new Stormwater law that set a very high bar for stormwater management, that unfortunately MDE did not attain in several key aspects of its implementing regulations, as this Consortium letter describes in detail.

Even if MDE had more fully adhered to the mandate established by the Stormwater Management Act of 2007 in its implementing regulations for ESD, the reality would still be that ESD is a stormwater management approach, not an anti-degradation land use planning methodology. At its best, ESD is only useful as a secondary backup layer of water quality protection; in this context the primary layer must be sound land use planning that avoids any degradation of sensitive waters including Ten Mile Creek.

(2) My powerpoint presentation - this is the PDF version of my testimony for the September 10th hearing.

In addition, I wish to make a few additional comments on the Hearing Draft of the Limited Amendment for Ten Mile Creek:

* Former Montgomery County Council President Scott Fosler has noted that in addition to a severe drought, there is another scenario that you must consider when charting the watershed land use plan for Ten Mile Creek: the potential need for the greater Washington, D.C. region to use water from Little Seneca Reservoir in the event of a loss of operations at the Potomac Filtration Plant. In that unlikely but still possible event, Mr. Fosler has described the need for clean, reliable drinking water from Little Seneca Reservoir that might need to be distributed for consumption in an unfiltered state. (This is akin to the New York City Watershed drinking water supply.) One of the implications of this emergency drinking water supply scenario are that we must act now to set a permanent, appropriately-protective land use policy for Ten Mile Creek as the last clean source of water to this reservoir.

* As an adjunct to the sound land use planning for Ten Mile Creek that we have advocated, that will not allow any degradation of Ten Mile Creek, I support the additional Environmental recommendations contained in the Hearing Draft on pp. 19-21, and I request that they be strengthened so that they comprise a set of additional mandatory/ regulatory requirements that are effective adjunct clean water measures. The thrust of these additional recommendations is to supplement land use planning and watershed-wide policies and regulations with additional required practices such as stream buffers. To be effective, these recommendations must contain measurable objectives that are everywhere enforced; hortatory language such as "*as much as possible*," in practice does little to effect watershed and stream protection.

* Regarding the requirement on page 19 for 175-foot wide buffers on both sides of streams: we request that this number be changed to the following requirement:

"Require 250-foot-wide forested buffers on both sides of streams or buffers that go all the way to the tops of ridges and hillslopes abutting the stream valleys - whichever is greater."

Thank you for considering my comments. I look forward to the upcoming worksessions on this Limited Amendment.

Yours,

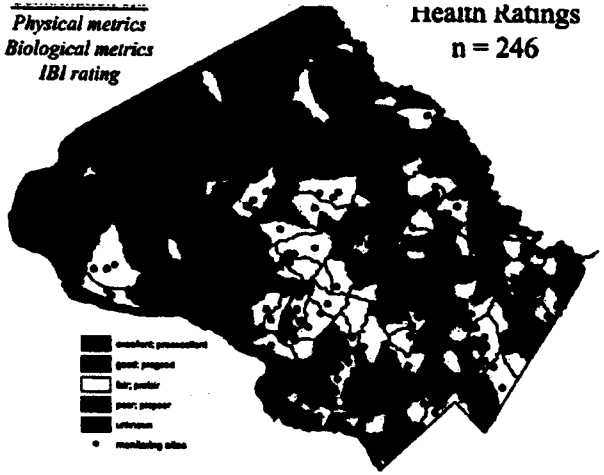
Diane M. Cameron
Conservation Program Director
Audubon Naturalist Society
(301) 652-9188 x22
dianecameron60@gmail.com

"Do unto those downstream as you would have those upstream do unto you."
– Wendell Berry

Ten Mile Creek – protecting our region's drinking water supply based on real-world data.

Diane Cameron
For Audubon Naturalist Society
And the Save Ten Mile Creek Coalition
Montgomery County Planning Board Hearing
On the Ten Mile Creek Area Limited Amendment
September 10, 2013

MONTGOMERY COUNTY STREAM DATA ANALYSED BY SCOTT GOETZ, GEOGRAPHER AT WOODS HOLE.

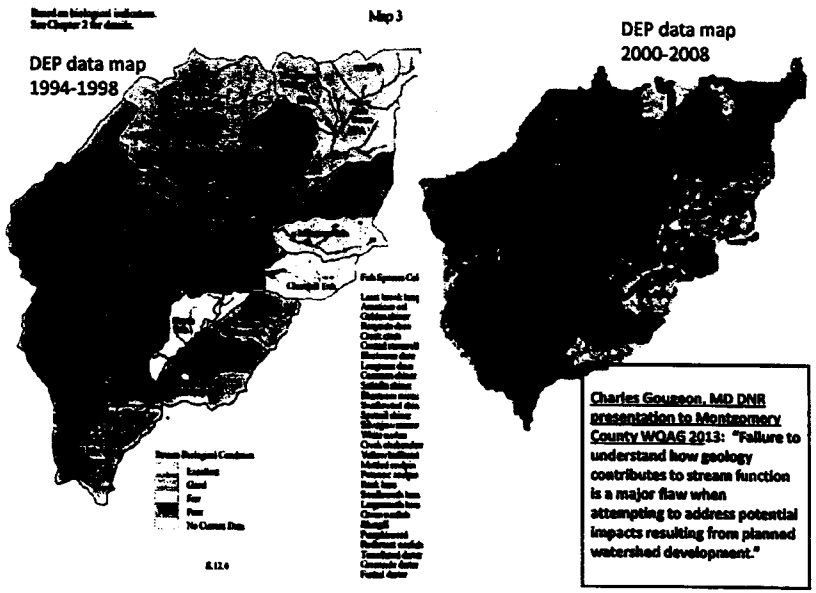


Note that as of the mid-1990s, Ten Mile Creek was in Excellent biological condition.

Also note that the streams in the County's Ag Reserve are generally colored Green or Blue, meaning Good or Excellent biological quality, whereas the streams in the County's Urban Core are Red or Yellow, meaning Poor or Fair quality.

If urban developments pollute and degrade our streams less than do farms – as the developers claim – then this map would appear in the opposite color scheme. The data show us that rural land uses correspond to higher stream quality than do urban and suburban land uses. Goetz' and others' analyses of real-world data back up this finding.

Little Seneca Creek Stream Condition



Charles Gousseon, MD DNR presentation to Montgomery County WQAG 2013: "Failure to understand how geology contributes to stream function is a major flaw when attempting to address potential impacts resulting from planned watershed development."

Modeling rests on Assumptions. If the assumptions are false, then conclusions based on them are invalid.

ASSUMPTION	PROBLEM
1) MDE stormwater regs = "woods in good condition"	1) MDE didn't base its ESD requirements on the science of woods in good condition.
2) Drinking water filtration plants take care of any pollution.	2) The Watts Branch lesson: filtration alone is not enough – we also need sound land use planning to protect our drinking water supply.
3) We can ignore stream channel scour.	3) Channel scour = most of the sediment loading.
4) ESD will improve stream health and protect Ten Mile Creek.	4) There are no field studies showing that ESD prevents biological stream degradation.
5) Streams will bounce back after construction ends.	5) Post-construction runoff causes ongoing degradation. Ten Mile Creek is especially sensitive due to species, soils, slopes, and geology.

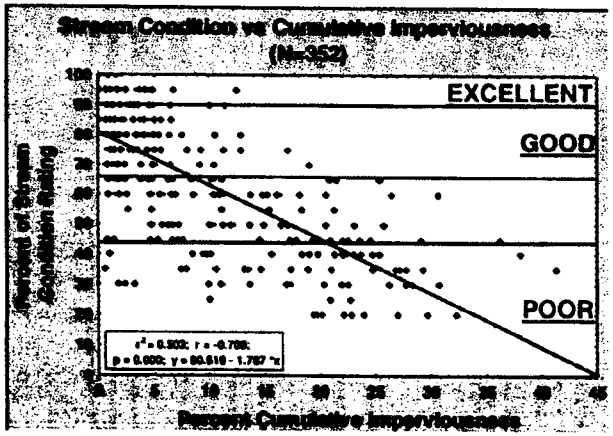
In 2008, the National Research Council
stormwater committee found that **"There is a direct relationship between land cover and the biological condition of downstream receiving waters.** The possibility for the highest levels of aquatic biological condition exists only with very light urban transformation of the landscape." (emphasis in the original.)

June 20, 2013 Montgomery Planning Staff memo:
"Given the level of development proposed, increases in stormwater runoff volume and peak flow can be expected in all development scenarios despite the application of ESD practices (Center for Watershed Protection, 2013)...Where case studies do exist at a subdivision scale, there is no conclusive evidence that ESD fully protects stream health."

MD DNR Habitat Conservation Matrix Team –
Letter from Scientist Scott Stranko to Chair Carrier 9.9.13

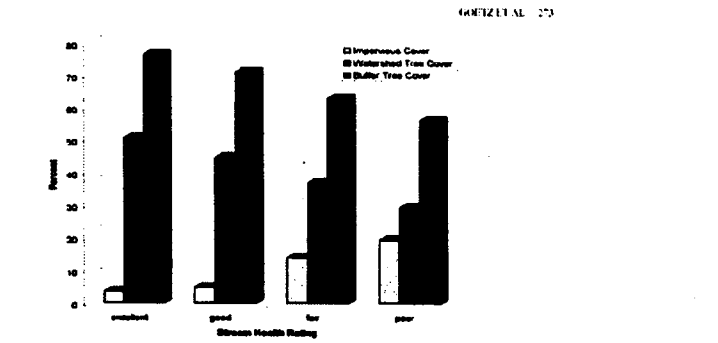
While studies have shown ESD to the MEP can reduce nutrient and sediment loads in the built environment, we are not aware of studies that have evaluated its effectiveness in maintaining or improving biological functions. Therefore, we support conservation of forested landscapes as the best means to protect ecological conditions that sustain biological resources.

Montgomery County DEP – stream biological data from 352 sites



Source:

Montgomery County DEP, Countywide Stream Protection Strategy, 2003 Update. at:
http://www.montgomerycountymd.gov/content/dep/Publications/pdf/CSPS2003.pdf



Goetz, Scott J, et al. (2004) Integrated Analysis of Ecosystem Interactions With Land Use Change: The Chesapeake Bay Watershed. *Ecosystems and Land Use Change, Geophysical Monograph 153. American Geophysical Union.* ftp://ftp.whrc.org/Mid-Atlantic/GOETZ-PUBS/Goetz-2004-ChapmanBook.pdf

Cascade of Effects from Urbanization

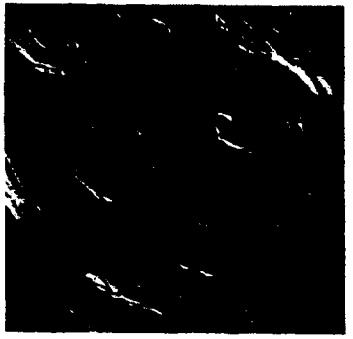
1) CONVERSION OF RURAL TO URBAN LANDSCAPES/ LAND USES
2) INCREASED IMPERVIOUSNESS
3) INCREASED TOTAL STORMWATER VOLUMES AND PEAK FLOWS
4) INCREASED CHANNEL SCOUR
5) DECREASED BASE FLOWS
6) DECLINING BIOLOGICAL INDICATORS
7) INCREASED DOWNSTREAM SEDIMENT LOADINGS
8) INCREASED WATER TEMPERATURES
9) DECREASED DISSOLVED OXYGEN LEVELS
10) INCREASED BACTERIAL COUNTS
11) INCREASED DRINKING WATER TREATMENT COSTS
12) ABANDONMENT OF DRINKING WATER RESOURCES
13) REPLACEMENT WITH MORE EXPENSIVE DRINKING WATER SOURCES

Construction and land alteration

Source: Mont.Co. DEP

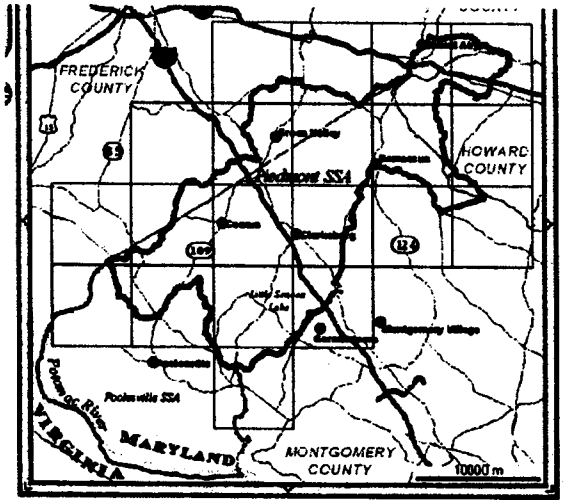
Special Protection Area

Report



Piedmont Sole Source Aquifer

Federal Register Notice (PDF) (4 pp. 537K, About
Map of all Mid-Atlantic Sole Source Aquifers



Conclusions

1) We appreciate staff's efforts to reduce impacts.
2) We must base our decisions for Ten Mile Creek on real-world data and experience, not on modeling.
3) Ten Mile Creek is the last clean source of water to our region's emergency drinking water supply at Little Seneca Reservoir.
4) Drinking water supply –surface and groundwater - and aquatic life protection should be the sole or pre-eminent objective of this watershed master plan.
5) None of the Scenarios analyzed thus far provide this protection and prevent degradation, so a new set of options must be created to establish this objective and show how to achieve it.

1000 Friends of Maryland · American Rivers
Anacostia Watershed Citizen's Advisory Committee · Assateague Coastal Trust
Audubon Naturalist Society · Chesapeake Bay Foundation
Chesapeake Stormwater Network · Environment Maryland
Friends of Harford · Friends of Rock Creek's Environment
Herring Run Watershed Association · Jones Falls Watershed Association
Maryland League of Conservation Voters
St. Mary's River Watershed Association · Waterkeeper Alliance

January 5, 2009

Mr. Brian Clevenger
Water Management Administration
Maryland Department of the Environment
1800 Washington Blvd.
Baltimore, Maryland 21230

Re: Comments on MD Stormwater Management Act Draft Regulations and Design Manual Changes

Dear Mr. Clevenger:

We are pleased to present the written comments of the Maryland Stormwater Consortium on the proposed regulations and Maryland Stormwater Design Manual changes to establish environmental site design (ESD) pursuant to the Maryland Stormwater Management Act of 2007 (the Act). The Consortium, a coalition of environmental organizations committed to improving stormwater management in Maryland, finds that the proposed COMAR regulations and manual revisions are positive and commends the Department of the Environment (MDE) on their efforts to make this progress.

In particular, we support the provisions relating to the requirement that ESD be invoked early in the site concept plan phase; the use of the three phases of concept plan, site development plan, and final stormwater plan; and the use of the flow charts to show the design process for both development and redevelopment.

In our view, however, several significant changes should be made to these regulations in order to bring them into conformity with the letter and the spirit of the Stormwater Act of 2007, and to achieve the promise of substantial positive impact on stormwater pollution in Maryland's rivers and streams. The changes and additions we recommend herein are intended to build upon the foundation which MDE has proposed and we urge that our recommendations be received in that vein. Our comments and recommendations address issues raised during the public hearing on December 8. We have also included in our comments several recommended COMAR language and manual text revisions.

1. Minimum Stormwater Treatment Volumes are Inadequate

Maryland's stormwater regulations must establish adequate minimum stormwater volume standards for new development and redevelopment, and must fully implement the Stormwater Management Act's groundwater recharge requirement. Md. Environ. Article Code Ann., § 4-203(b)(8)(vi) (2008). All development and redevelopment projects subject to stormwater regulations under the Act must determine the stormwater volumes to be reduced on-site. For Environmental Site Design to be effective, numeric volume standards that determine the quantity of stormwater to be reduced are critical to the entire design process.
Additionally, we believe that the definition of "Runoff Reduction" is crucial, because it provides the allowable set of hydrologic functions and performance objectives, along with the percentage of volume reduction that ESD practices and whole sites must attain. Each is discussed below.

A. MDE's proposed *new development* minimum volume and ESD Sizing methodology are not adequate.

The ESD Sizing Criteria in Chapter Five should be revised to require on-site reduction of the full Channel Protection Volume (CPv). The Act requires developers to demonstrate that they have implemented ESD to the Maximum Extent Practicable (MEP). Md. Environ. Article Code Ann. § 4-203(b)(5)(ii)3.A. (2008). ESD is defined in the statute as:

> "Using small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources." Md. Environ. Article Code Ann. § 402.1(b) (2008).

In order to fully mimic "natural hydrologic runoff characteristics," and ensure that ESD is implemented to the MEP, MDE must establish a numeric stormwater retention or reduction volume for new development that preserves and/or recreates the original pre-development hydrologic runoff characteristics of the site. As noted below, without an adequate numeric runoff reduction volume to be required of developers, site designers will fall back to the pre-Stormwater Management Act approach of using standard structural practices. This scenario will not protect streams or groundwater supplies nor is it consistent and compliant with the Act.

MDE obviously recognizes that a required minimum volume of water must be established for on-site retention via ESD measures, and has attempted to address this crucial need. Unfortunately the minimum volume MDE has proposed for on-site retention via ESD practices is far below the level that would mimic pre-development hydrology and also far below the level that is practicable.

We support the intent of the draft regulations – to treat the full CPv with ESD, but MDE has proposed that the CPv be merely a target to be addressed, not a requirement that sets the minimum on-site reduction that must be achieved. The proposed Chapter 5 ESD sizing criteria actually only requires the one-inch Water Quality Volume (WQv) as the floor for sizing ESD

measures. The required volume must be the actual reduction of the full CPv, as opposed to just a "target" for on-site retention of stormwater via ESD techniques.

Existing ESD subdivisions, such as Pembroke in Frederick County, have demonstrated that much larger volumes of stormwater, far beyond MDE's proposed minimum of 1", can be fully reduced on-site. Pembroke's designers used the 2-year storm (3 inches of rainfall) as the design storm and achieved downstream protection for large flood events.

MDE must require the full CPv, ranging from 99% of 2.4" to 2.8" depending on the County, to be reduced (retained on-site) via use of ESD measures.

To achieve this fundamentally important change, MDE should revise Draft Chapter 5, page 5.18, Section 5.2.3. Addressing Stormwater Management Requirements Using ESD as follows:

- Change the subheading of "Treatment" to the term "Runoff Reduction" (see below)
- Change the text to read as follows:

ESD practices shall be used to reduce the Channel Protection Volume (CPv) on all new developments where stormwater management is required.

Delete the text immediately below this statement, beginning with the phrase, "ESD practices shall be used to the MEP to address CPv..."

B. MDE needs to establish an operational definition of "runoff reduction".

Chapter 5 breaks important new ground in defining the need for runoff reduction as the primary means of defining what constitutes an ESD practice, and the extent to which MEP compliance is assessed at the site. However, Chapter 5 does not go beyond a specific list of practices, which studies show can differ in runoff reduction by as much as 50 to 75%, depending on their design, soil type and sizing. In addition to listing and providing specifications for individual ESD practices, MDE must adequately define the objectives and numeric standards that entire sites as a whole must attain.

The proposed COMAR Section 0.02 Definitions would be greatly improved if it provided an operational and numeric definition of "runoff reduction", that is easily understood by both the design consultant and the local plan reviewer. A clear definition of "runoff reduction" is also needed in Chapter 1 to provide a numerical benchmark to define the quality of MEP achieved by ESD practices. This approach is technically documented by CSN (2008) and is recommended by the National Research Council (2008).

We recommend the following operational definition of "runoff reduction":

> "Runoff reduction is defined as the total annual runoff volume reduced by an ESD practice through canopy interception, soil infiltration, evaporation, rainfall harvesting, engineered infiltration, evapo-transpiration or extended filtration that delays the delivery of stormwater from small sites to the stream system by six hours or more. The rate of

runoff reduction is expressed as a numerical percentage, as based on current available science."

C. MDE's proposed treatment requirements for *redevelopment* are insufficient.

The proposed standard for treatment in redevelopment settings remains inadequate. While the 50% reduction in impervious coverage and/or treatment of 50% of site imperviousness represents an improvement over the existing redevelopment treatment requirement (20%), it would represent a missed opportunity to make a truly meaningful improvement in stormwater management in areas which currently have little to no stormwater management.

There is ample support for significantly increased stormwater management standards in recent reports discussing Chesapeake Bay restoration needs; both the US EPA Office of Inspector General and the National Research Council have recently published analyses and recommendations for increasingly stringent stormwater requirements. Many jurisdictions around the country have successfully, and with no ill effects, adopted more stringent stormwater treatment requirements in highly urbanized areas. Indeed, even in Maryland, Montgomery County strives for the full CPv treatment for redevelopment projects, but accepts some waivers and sets a ***minimum*** treatment requirement of the WQv (roughly 1 inch). Philadelphia, PA to our immediate north, requires treatment of the WQv for both new development and redevelopment. Seattle, WA; Portland, OR; Minneapolis, MN; Austin, TX; Charlotte-Mecklenburg, NC; and Knox County, TN all have elevated stormwater management standards that require at least the treatment of 1 inch or management of the full WQv, despite the fact that parts of these jurisdictions are densely developed, that some are experiencing much redevelopment, and that others are challenged by more rainfall than we experience in Maryland.

We firmly believe that MDE must require a minimum stormwater treatment requirement of the WQv (i.e., manage for the 90th percentile of average annual runoff volume) for redevelopment projects, even for highly urbanized sites. This treatment performance standard is reasonable and economically achievable, it is straightforward and eminently understandable, and it allows site designers and engineers to utilize what site designs, practices, or systems work best, instead of merely requiring impervious surface reduction by a certain percentage. Urbanized areas can and should be required to meet these higher - but still achievable –standards, or we may never see the kinds of significant water quality improvements in waterways that course through urbanized areas of Maryland, that most experts agree are crucial to obtaining Chesapeake Bay water quality advances.

We also steadfastly reject the notion that strengthening stormwater treatment requirements for redevelopment projects will inherently "kill Smart Growth efforts" in Maryland. Nowhere to our knowledge has this claim been credibly demonstrated, yet it unfortunately is circulated and held as truth by many who would rather not impose higher standards for stormwater or change "business-as-usual". A 1-inch treatment requirement for redevelopment would still be a lower treatment standard than what we propose for so called "green-field," *new development*, so it does not intrinsically place redevelopment at a competitive disadvantage when compared to green-field development projects. This position was recently articulated in a letter to MDE Secretary

Wilson by several state, regional, and national environmental organizations that focus efforts on Smart Growth.

In addition, in October 2008, the Chesapeake Bay Foundation, Audubon Naturalist Society, and the Anacostia Watershed Society sponsored an assessment of relative costs associated with meeting both the WQv and the CPv on three actual urban sites within Maryland jurisdictions with hypothetical and real redevelopment projects. What the exercise revealed was that the use of ESD in many urban settings can be a cost-effective way to meet redevelopment stormwater treatment requirements, and that the attainment of the 1" standard is not infeasible. While we are not asserting that the entire WQv of 1 inch can always be achieved through ESD alone, this minimum standard, in combination with the step-wise process included in the draft Manual, can maximize the use of ESD in redevelopment.

Where physical site constraints make on-site treatment of 1 inch simply unachievable, the kinds of "alternative management" options included in the draft manual, including off-site treatment BMPs, stream restoration or retrofits elsewhere within the same watershed, or perhaps increases in land use intensity (housing or employment) on-site, to achieve smart growth objectives, are possible alternatives. We believe this standard represents a fair, though stringent, requirement that can be met and that will advance important Chesapeake Bay-related water quality goals for Maryland's urbanized watersheds.

Of further concern is the definition of "redevelopment", which contains a size threshold of 5000 square feet. This is too high to meaningfully include enough redevelopment activity in highly-urbanized areas, and will eliminate opportunities to improve stormwater management. A recent review of redevelopment projects in Baltimore City in 2005 found that of the 476 projects that required grading permits, 418, or 88%, were exempted from stormwater treatment requirements because the projects were not greater than the 5000 square foot threshold. The Cities of Portland, OR and Austin, TX use a threshold of 500 ft^2, while Washington DC applies its runoff reduction requirements to 250 ft^2. We recommend reducing the current threshold to 2500 square feet to capture more redevelopment projects and, of crucial importance in the Chesapeake Bay watershed, to increase opportunities to add stormwater management where none currently exist, especially in urban areas.

D. <u>The numeric groundwater recharge requirement in the Act has been omitted.</u>

The groundwater recharge and groundwater portion of the ESD Sizing Criteria in COMAR and the Manual must reflect the statutory language that requires all stormwater management plans to "maintain 100% of the average annual predevelopment groundwater recharge volume" for a given site. Md. Environ. Article Code Ann. § 4-203(b)(8)(vi) (2008). This specific recharge volume for each site must be demonstrated by the developer using hydrologic and hydraulic calculations based upon data indicating pre-development groundwater recharge levels provided by MDE. New Jersey uses a "Groundwater Recharge Spreadsheet" to enable place-based calculations of recharge levels based on mass balance calculations from precipitation and runoff data. Similar data tables must be developed for Maryland in order to establish adequate groundwater recharge volumes that will comply with the Act and protocols for natural or enhanced infiltration wherever necessary.

The language of Standard No. 3 on page 1.13 of the Manual is noncompliant with the Act, which requires not merely mimicking of pre-development groundwater recharge volumes, but maintenance of such volumes. We propose the following revision to Standard 3:

> "Annual groundwater recharge rates and volumes shall be maintained through full use of non-structural and structural infiltration practices. Developers must demonstrate through hydraulic and hydrologic calculations and other site-specific data that the average annual pre-development groundwater recharge volume will be maintained."

All additional sections in the proposed revised Manual that implement this standard and that otherwise pertain to groundwater recharge and infiltration volume requirements should be revised to fully reflect and comply with the Act's specific groundwater recharge volume requirement. For example:

- Section 2.0, page 2.1. Table 2.1: "Recharge Volume Description."
- Section 2.2, page 2.5 Recharge Volume Requirements (Rev)
- All Design Examples throughout the Manual that include Recharge calculations need to be revised.
- All Stormwater practice information in the Manual Chapters 3, 4, and 5, that rests upon assumptions related to the Recharge requirements, needs to be revised to fully require and to implement the statute's groundwater recharge requirement.

2. **"Maximum Extent Practicable" must be Strengthened**

The definition of maximum extent practicable (MEP) proposed within the COMAR text is a good start, but we believe the General Assembly provided further guidance regarding application of "MEP" by including language that standard BMPs may be used at a development site only when "absolutely necessary." Md. Environ. Article Code Ann. § 4-203(b)(5)(ii)3.B. (2008). To fully capture this legislative intent, we recommend modifying the proposed definition of "MEP" and several additional text changes in COMAR and the Manual.

"(22) Maximum extent practicable (MEP) means, for the purposes of this chapter, designing stormwater management systems so that all opportunities for using ESD planning techniques and treatment practices are exhausted and that the developer demonstrates to the approving authority that it is absolutely necessary to use standard best management practices on a development site."

We also firmly believe that it is crucial that there is consistent use of the definition of MEP throughout COMAR and the Manual text. It is both misleading and inaccurate to substitute the words "explore" or "evaluate" when the intent is to "exhaust" the use of ESD. Such substitution does not reflect the Act or the definition of MEP. Therefore, we recommend the following changes to COMAR text.

26.17.02.01 .01 **Purpose and Scope**

A. In the last line, insert "ABSOLUTELY" between "when" and "necessary"

26.17.02.01 **.04 Stormwater Management Ordinances**

B. (1) Insert: "d. REQUIRES THE IMPLEMENTATION OF ENVIRONMENTAL SITE DESIGN TO THE MAXIMUM EXTENT PRACTICABLE."

26.17.02.06 **.06 Minimum Control Requirements**

(2) At the end of the last sentence in this numbered paragraph which begins with "The MEP standard is met", insert, after the word "necessary" the following: "BY THE APPROVING AUTHORITY."

26.17.02.09 **.09 Stormwater Management Plans**

(e) Insert after "design": "AND WHICH DEMONSTRATES THAT ESD WAS USED IN THE FINAL DESIGN TO THE MEP;"

Such language is important in order to comply with the law itself, which uses the term "practicable," not practical. "Practicable" is a term of art used in environmental policy and regulation to describe that which is *at all feasible*, not merely that which is most convenient, or that which is less costly than some other means. Weak language leaves unclear the rationale that may be accepted for failure to maximize ESD. For example, could a developer suggest ESD practices were "explored" but because they cost a bit more, s/he decided against implementation? Could the designer/engineer contend s/he used practices that were "proven" or "customarily used?" In addition, we believe it is imperative that site developers be required to *demonstrate* or describe how they have achieved ESD to the MEP within each review phase. For example, the developer could include computations of runoff reduction, or could include a narrative description of which ESD practices were considered and how each were ruled out or incorporated.

Additionally, in the Manual, we believe the following changes would buttress the application of the definition of MEP.

Section 5.1.1 Introduction

After the full paragraph and in the fourth bullet, strike "explored" and insert "EXHAUSTED;" and insert after "surfaces" the words "AND THAT STANDARD BEST MANAGEMENT PRACTICES HAVE BEEN USED ONLY WHERE ABSOLUTELY NECESSARY."

Furthermore, we believe that process flow charts in the Manual should also be revised. Figures 5.1 and 5.21 in Chapter 5 depict the design processes for new development and redevelopment, respectively, and Section 5.1.3 text states that these design process shall be used as "an enforceable mechanism during review of the plan." However, there is an inconsistency between the text description of the development phases and the figures. To remedy this

inconsistency, we believe that information should be added to guide the design practitioner/developer with respect to full achievement of ESD to MEP and full achievement of the integration of erosion and sediment control (ESC).

Figure 5.1 should be amended as follows to address the inconsistency:

1. The concept phase box should include an entry indicating that erosion and sediment control design issues have been addressed.
2. There should be a diamond between "submit concept plan" and "site development plan" which inquires as to whether all ESD options were used and whether ESC issues have been addressed. If the answer to either of the questions is "no" then an arrow should show that the proposed concept plan had been returned to the applicant to address these two issues.

These same amendments should be made to Figure 5.21.

3. Supplemental Design Guidance for ESD and Other Tools are Needed to Ensure Meaningful Local Implementation

A. MDE must allow flexibility in using the most up-to-date design standards.

While the technical standards for ESD practices contained in Chapter 5 are a good start, these design specifications are continuously evolving, and many technical elements of the new Chapter are missing and/or will soon be out of date. A few examples where expanded or more detailed design specifications are needed include:

- The proposed bioretention media mix has been shown to result in increased phosphorus discharge according to recent research;
- Standards are lacking for practices such as soil compost amendments, and much more detail is needed for non-structural practices such as filter strips, grass channel and rooftop disconnection, and reforestation than is currently provided in the Chapter 5;
- Changes are needed to traditional structural BMP specifications to ensure they are only used as a practice of last resort, along with updated design;
- More specific detail on proper practice installation, construction sequence and maintenance is needed to promote greater performance and longevity and prevent premature practice failure; and
- Special design modifications need to be provided for karst and coastal plain terrain which is present in much of the state (e.g., CSN 2008b and CSN 2008c).

The key point is that a flexible update process is needed to enable MDE and local jurisdictions to enhance their current design standards to continuously improve the performance, installation, and maintenance of both ESD and non-ESD practices. The Chesapeake Stormwater Network (CSN), in collaboration with dozens of researchers, engineers and plan reviewers, has engaged in a process to continuously update design standards for the following practices, with current editions of each design specification readily accessible on the CSN website (www.chesapeakestormwater.net):

Rooftop Disconnection	Rain Tanks and Cisterns	Dry Swales
Filter Strips	Permeable Pavers	Filtering Practices
Grass Channels	Infiltration	Constructed Wetlands
Soil Compost Amendments	Bioretention	ED Ponds
Green Roofs	Urban Bioretention	Wet Ponds

These peer-reviewed design specifications are being adapted by the Commonwealth of Virginia, and are under consideration by the District of Columbia, West Virginia and other States, and provide an excellent resource for local government

We firmly believe that the following COMAR modification would provide clear flexibility to utilize the best new ESD design technical standards as they are developed.

Section 0.01- 1B Documents Incorporated

(1) Insert after "Supplement 1" the following "OR MOST RECENT EDITION OF BAY-WIDE STORMWATER DESIGN SPECIFICATIONS OR SUBSEQUENT MDE SUPPLEMENTS OR LOCAL EQUIVALENTS ARE"

This minor change to the existing language takes the pressure off of MDE to be the sole arbiter of design requirements for ESD practices in the coming years, and grants flexibility to early local adopters to go well beyond the minimums in Chapter 5.

B. Implementation Tools are Needed for Local Governments.

The transition to the new ESD stormwater paradigm will be temporarily difficult for the stormwater design and plan review community, and will require considerable investments by MDE, local governments, and NGO technical service providers to develop on-site compliance tools, training and certification, and maintenance reduction techniques to improve real world implementation. The Consortium believes the following should be priorities for early action.

i. Compliance Tool (Spreadsheet)

The biggest missing link in the proposed regulatory package is that it does not outline a specific methodology for showing numeric compliance at a development site (e.g. the Virginia runoff reduction compliance spreadsheet (CSN, 2008). This is significant since there is no transparent way for design consultants and local plan reviewers to agree on what constitutes ESD compliance to the MEP at real world sites. A small technical workgroup could quickly come to consensus on how to adapt the Virginia spreadsheet to meet Maryland conditions. This need has been expressed by both the design community and local government plan review staff

ii. Training and Certification

An intensive training program is needed to get the several thousand local designers, plan reviewers, and other decision-makers up-to-speed on the new techniques and compliance methods. The responsibility for this training can be shared among MDE and myriad stakeholders. In fact, the CSN and the Center for Watershed Protection (CWP) recently developed a proposal to create a statewide stormwater training alliance involving all major stakeholders in the training process.

4 Additional Sediment and Erosion Control Protections are Needed

Section 5.1.3.2, "Erosion and Sediment Control Plans," requires that sediment and erosion control plans contain four elements. We believe each can be strengthened.

Preservation (p.5.12)

After the sentence ending with "be identified" insert: "A MAXIMUM UPPER LIMIT FOR UPSTREAM DRAINAGE AREAS TO INDIVIDUAL SEDIMENT BASINS OR TRAPS AND A PROHIBITION ON DIRECT DISCHARGES TO STREAMS SHALL BE ESTABLISHED."

Phasing and Sequences of Construction During Each State of Development (p. 5.12)

At the end of the first paragraph, insert: "FOR EACH SEQUENCE OF CONSTRUCTION, SOIL STABILIZATION SHALL BE COMPLETED WITHIN 24 - 72 HOURS AFTER SOIL HAS BEEN EXPOSED."

Stabilization Strategies (p. 5.13)

In the first paragraph, third sentence, strike "Where this cannot be accommodated;" Replace "14 days" with "24 hours."

In the second paragraph, strike the first two sentences. Insert: "NO MORE THAN SIX ACRES AT A TIME ARE TO BE CLEARED, GRADED, OR OTHERWISE DISTURBED."

In the third paragraph beginning with "Natural vegetation", insert a new third sentence to read: "STOCKPILES OF EARTH SHALL BE COVERED OR STABILIZED WITHIN 24 HOURS OF ESTABLISHMENT OR USE."

5. Clarify the Three-Step Planning Process

First, within the initial Concept Plan review step, there appears to only be a requirement for the review of submitted plans and feedback from the local authority, but no provision for outright rejection of what may be truly inadequate plans that do not maximize ESD approaches and practices. We believe that applicants must understand the repercussions of inadequate utilization

of ESD to the MEP and that a local reviewing agency must have the authority to require a full overhaul of insufficient plans.

Second, nowhere in the three-step design and planning process are there public notice or review opportunities. While the sediment and erosion control plan element has (based on the Construction General Permit recently released) a provision for notifying interested stakeholders via posting of Notices of Intent on the MDE website, there are no similar notification or allowances for public input into other phases of the project design and review outlined in the regulations or manual. Public review and opportunity for comment must be included in each stage of the design and planning process outlined within the Manual if we wish to ensure an open and inclusive process.

6. Grandfathering Must be Adequately Addressed

At the public hearing, several stakeholders requested inclusion of a "grandfather clause" for development projects that should not be covered by the new regulations or manual. While no specific recommendations were proposed, we believe that the statute sets forth sufficient guidance. By detailing requirements for ESD to the MEP and the coordination of stormwater and ESC planning, we believe the General Assembly clearly intended these activities to begin immediately upon completion of the required regulatory and design modifications.

We believe that when MDE receives final approval of the proposed COMAR and Manual changes, any project-level ESC plan application submitted to the approving authority and not yet approved, will be required to adhere fully to the Act and the regulations. Nonconforming plans should be returned to the applicant by the approving authority.

Such a procedure would be clear enough for the regulated community. The Act was passed in April 2007 and work on the regulations and Manual changes commenced shortly thereafter; the proposed changes were published in October, 2008. We recommend that the following be added to the proposed COMAR regulations:

26.17.02.01".01 **Purpose and Scope**

"C. Once finalized, these regulations and any amendments apply to all qualifying new development and redevelopment projects that do not have an approved erosion and sediment control plan at the time such regulations take effect."

7. Protections for Trout Streams and Wetlands Must be Expanded

Recent research has demonstrated that direct stormwater discharges can have a deleterious impact on sensitive receiving waters such as trout streams and wetlands at extremely low levels of land development (Stranko et al, 2008, Wright et al 2007, Cappiella et al 2006, and Schueler et al, in press). Consequently, a greater level of protection is needed to safeguard these important ecosystems from the impacts of land development. The section in Chapter 5 on Special

Watersheds mentions these ecosystems but needs to be expanded to provide comprehensive, numeric stormwater protection measures, beyond the basic minimum requirements for other receiving waters. In each of the following sections, we recommend the following changes.

3a: Stormwater Discharges to Trout Streams

Add the following to Section 5.6.6:

- Maximize the infiltration capacity of each practice in order to minimize the thermal impacts associated with runoff from impervious surfaces. All practices should be designed to cause no increase in downstream temperature;
- Explicitly prohibit the use of ponds for runoff treatment in trout watersheds; and
- Ensure all zero-order and other streams have a high quality riparian forest buffer

Add the following to *3b Stormwater Discharge to Wetlands*

- Define a series of sensitive MD wetland types that merit special protection (e.g., bogs, fens and others, see Wright et al, 2007);
- Explicitly prohibit the use of natural wetlands for stormwater treatment of any kind; and
- Require modeling and monitoring analyses to confirm no changes in post development hydro-period in sensitive wetlands, which is operationally defined as no more than six inches of additional water level fluctuation for a one-inch storm.

8. MDE Should Examine Alternatives to the Hydrologic Soil Group System

The use of Hydrologic Soil Group system ("HSG") to derive infiltration rates and curve numbers is problematic, and we urge MDE to examine alternatives. While the HSG and related curve number methods are convenient for site designers and regulators as a substitute for actual field measurements, a growing body of evidence from stormwater engineers, soil scientists, and others suggests that there are several significant flaws associated with this method. These flaws raise doubts about the ability of HSG and related curve numbers to adequately represent actual in-the-field infiltration capacity of soils and associated vegetation and bedrock.

MDE must reconsider its heavy reliance on the NRCS HSG methodology, in favor of an ESD sizing criteria methodology that both surveys site-specific soil, water, bedrock, and vegetation conditions, and that requires developers to demonstrate via a spreadsheet or other simple method that the full Runoff Reduction Volume has been reduced on-site. MDE's regulations and Manual should also specify enforceable methods to protect intact vegetation and soils from destruction and compaction.

Overall, our organizations commend the work that has clearly gone into modifying MD's stormwater regulations and Design Manual to reflect the Stormwater Management Act of 2007. While we believe these proposed changes represent a good step in the right direction, we firmly believe that Maryland will miss the statutory intent, as well as the real-world opportunity presented by more aggressive modification of the proposed regulations and manual. Recent modeling results suggest that we are collectively much further behind in Chesapeake Bay

restoration than previously believed and urban/suburban stormwater impacts are a primary culprit in this lack of progress. Indeed, stormwater represents the only sector moving in a negative direction in terms of tangible nutrient and sediment pollution reduction to our rivers and streams. It is through this lens that we reviewed the proposed regulations and developed our comprehensive comments for necessary changes. Without more stringent stormwater management regulations, Maryland will certainly fail to make meaningful progress toward cleaning up our rivers, streams, and the Chesapeake Bay.

Sincerely,

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Cindy Schwartz
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Friends of Rock Creek's Environment

Halle Van de Gaag
Jones Falls Watershed Association

Mary Barber
Anacostia Watershed Citizen's Advisory Comm.

Kathy Phillips
Assateague Coastal Trust

Jeffrey Odefey
Waterkeeper Alliance

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Attachment 2: Questions and Concerns about use of the Hydrologic Soil Group (HSG) method.

Further discussion of the flaws in the HSG-based method

Vegetation coverage on a given site, its density, coverage and maturity are critical to the quantitative stormwater reduction capacity of the site. Yet, the current HSG method, based on the "extreme storm" (saturated antecedent conditions) is based upon bare soils. This method is then supplemented via curve numbers that make broad assumptions about various land covers that don't fully reflect on-the-ground conditions.

The basis for "pre-development hydrology" indicated in the Stormwater Management Act of 2007 is "woods in good condition." Yet MDE's proposed ESD sizing criteria methodology does not adequately reflect the complex hydrologic functions of such woods. Healthy woodland soils in good condition actually can infiltrate much higher quantities than commonly assumed.[1] Root density is one factor – large vertical tree roots in a healthy forest can exceed 4000 per acre.[2] The factors that matter most for water infiltration are:

1) Whether the soil has intact organic layers
2) Whether the soil has intact, preserved, mature vegetation, and
3) Whether the soil has been protected from compaction.

Interestingly, though clay soils certainly behave differently than loamy soils in terms of their permeability and water retention characteristics, clay content is not as strong a predictor of whole-catchment hydrology and runoff reduction capacity, as whether the native soils and vegetation have been preserved or destroyed. Both the Sisters Creek and Pembroke studies cited above are located in the Maryland Piedmont, a high-clay region, and both studies documented high levels of runoff reduction.

HSG factors and Curve Numbers have been found to be Inaccurate.

A recent field survey of soils in Ocean County, New Jersey indicates that measured infiltration rates for disturbed soils with high bulk densities were significantly lower than expected, while the measured infiltration rates of undisturbed wooded and pastured soil were higher than expected.[3] In a separate study, a group of Pennsyvlania researchers found that of 37 of the original watersheds used in the NRCS TR-55 and HSG papers, in 25 of the watersheds, the NRCS models were either over- or under-predicting the actual historical watershed runoff rates

[1] Ocean County NJ Soil Conservation District (March 2001). *Impact of Soil Disturbance During Construction on Bulk Density and Infiltration in Ocean County, New Jersey.*

[2] Carmean, Willard. (1957). The Structure of Forest Soils. The Ohio Journal of Science 57(3): 165. Carmean cited the work of Gaiser, R.N. and J.R. Campbell (1951) The concentration of roots in the white oak forests of southeastern Ohio. Central States Forest Expt. Sta. Tech. Paper 120. and (1952). Root chananels and roots in forest soils. Soil Sci. Soc. Amer. Proc. 16:62-65.

[3] Ocean County Soil Conservation District, Schnabel Engineering Associates, Inc. and USDA Natural Resources Conservation Service (2001) Impact of Soil Disturbance During Construction on Bulk Density and Infiltration in Ocean County, New Jersey. at http://www.ocscd.org/soil.pdf

by more than 30 percent.[4] The extreme storm event basis for the NRCS/HSG method has also been questioned recently as inappropriate for non-extreme event modeling in humid regions.[5]

Soils can be amended to retain and infiltrate higher-than-expected quantities of water. Another reason to question the appropriateness of using the NRCS HSG database and curve number model is that developers and land management and landscaping contractors can do much to alter the standard curve number through revegetation and reforestation methods as well as through compost and various other soil amendments and land management techniques. For instance, something as simple as whether or not a forest bordering a row of houses and backyards is protected legally from incursions, and whether or not it is subjected to homeowners' clearing of brush and leaf-blowing operations, can affect the soil condition, organic content and permeability. As noted by a land management consultant in Georgia, "Soil amendments like compost could be used to improve the hydrology and move from one soil group to another."[6]

Destruction and Compaction of Native Soils can create long-term permeability losses. University of Maryland Soil Scientist Gary Felton has noted studies from the technical literature indicating that once native soils developed for residential subdivisions have been compacted below 2 inches, infiltration rates remain depressed after 12 years of turf growth – essentially, "moderate to deep compaction is forever." By far the best "cure" for soil compaction is prevention.

The statute requires replication of pre-development hydrology, and MDE must reflect the science that indicates that woods in good condition reduce runoff volumes by more than 99%. At least one published scientific field study using the observed mass balance methodology documented that 99% of annual precipitation is captured on-site by woods in good condition. Also, a well-documented ESD site in Maryland has shown that even very large storms are controlled by well-designed ESD subdivisions. One study of the hydrology of "woods in good condition" was performed by Leopold, Wolman and Miller of then-fully-forested Sisters Creek subwatershed of Cabin John Creek. They reported:

> **".... In 1961, during which there was 37.6 inches of precipitation, there were 11 events during which runoff occurred in the rill, and this runoff totaled about 0.21 inch, or less than 0.6% of the precipitation. "**

Thus, a mature forest in heavy clay soils in Montgomery County has been documented as providing nearly 100% capture of annual precipitation.

Reasons why the HSG method is less than desirable for use in ESD include:

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[4] Fennessey et al. (2002) Accuracy and Precision of NRCS Models for Small Watersheds. Paper No. 00007 of the Journal of the American Water Resources Association, abstract at http://www3.interscience.wiley.com/journal/119029251/abstract?CRETRY=1&SRETRY=0
See also: Fennessey (2001) The NRCS Curve Number: A New Look at an Old Tool. Proceedings of the 2001 Pennsylvania Stormwater Management Symposium. http://www.opp.psu.edu/environment/stormwater/CN-paper.pdf

[5] Fennessey op cit. (2001).

[6] King, W. (2003) *Innovative Uses of Engineered Soils and Functional Landscapes in Stormwater Management and Land Planning.* Procedings of the 2003 Georgia Water Resources Conference, University of Georgia.

- The soils on which the HSG method is based were tested as bare soils, whereas ESD by its very nature usually involves vegetated practices both non-structural and structural.[7] It's crucial that the role of vegetation be fully and accurately rolled into whatever ESD sizing criteria methodology that MDE uses.

- Field surveys have suggested that the HSG infiltration rates are inaccurate.

- HSG infiltration rates and associated curve numbers are subject to change by site practices both positive and negative.

The most accurate way to apply Environmental Site Design to a given site in order to maximize its stormwater retention capacity is to conduct appropriate field tests of soil permeability; site field surveys of vegetation health and diversity; soil and rock strata and groundwater characteristics; and other site-specific factors. MDE needs to require field testing of soils and mapping of natural features as part of site characterization, and also needs to re-examine the accuracy and appropriateness of the HSG and related curve number methodology, and alternative proposed methodologies, based on available technical research. Further information on this topic is provided in the Appendix to these comments.

The "triple whammy" that conventional non-ESD development practices do to native soils: clearing of vegetation, stripping of the organic layer, and compaction – profoundly affects infiltration rates and capacities. Another study, also noted by Felton, found that turf grass established over an original (intact) soil profile infiltrated 2 to 4 times as much water as sites with "standard" construction practices.[8]

MDE should reconsider the HSG method, and consider requiring site-specific field surveys and tests. A growing body of evidence suggests that the HSG database and curve numbers which are of questionable relevance to "woods in good condition." The site-specific field surveys should include: hydrologic mass balance field tests[9]; measurements of soil permeability; natural drainageways; soil and bedrock strata; vegetative conditions, planned soil and vegetative restoration measures; and the preservation of these features through a detailed ESD site plan and map.

MDE should also revise Chapter 5 to require field testing of soil permeability and field mapping and preservation of natural drainageways and intact vegetation and other key natural features. Instead of requiring the use of the HSG-based Curve Number methodology, require a more accurate methodology that either is based on alternative curve numbers that more accurately reflect the critical runoff source and absorption areas before and after development,[10] or on other

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[7] Natural Resources Conservation Service, National Engineering Handbook, Part 630 Hydrology. Chapter 7, Hydrologic Soil Groups, p. 7-1. http://directives.sc.egov.usda.gov/17757.wba

[8] Felton, G. Research Review of Nitrogen Losses From Turfgrass. (undated) at: http://www.mawaterquality.org/themes/relm/backyardstothebay/1FeltonTurfNitrogenLitSur.pdf

[9] Livingston, Eric. (undated). "Lessons Learned about Successfully Using Infiltration Practices." page 88. "*Infiltration rates should be determined by mass balance field tests if possible. They provide the most realistic, accurate estimate of the percolation rate.*" www.epa.gov/ORD/WebPubs/nctuw/Livingston2.pdf

[10] Fennessey and Hawkins, (2001), proposed a new conceptual curve number model that more intricately reflects the wide differences in hydrologic behavior and runoff characteristics within a small site or catchment. Fennessey's

field-data-based methodologies. Whatever the suggested or required methodology, the site designers should be required to incorporate this quantified field data and proposed ESD site map into their runoff reduction calculations.

Exclusions and discouragement of clay soils from the use of ESD practices should be removed from the draft manual. The current draft excludes or discourages clay soils from use in permeable pavements, rooftop disconnection, and other practices. The Stormwater Management Act requires that developers mimic the hydrology of woods in good condition, and even high-clay soils in such conditions have high water retention and infiltration capacities via many ESD practices. MDE should remove the clay soils exclusions and discouragements in the permeable pavement, rooftop disconnection, landscape infiltration, dry wells, and all other Chapter 5 sections and practices where they appear. Replace these with requirements for site-specific soil permeability testing and soil and vegetation preservation requirements for all sites, as recommended above, regardless of actual or presumed soil type; and allow and encourage the use of first, non-structural, and secondly, structural ESD practices in all soils.

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proposed conceptual model derived significantly lower curve numbers for upland areas' pre-developed conditions, compared with the conventional HSG model results. Fennessey, A.J. and Hawkins, R.H. (2001) *The NRCS Curve Number: A New Look at an Old Tool.* Proceedings of the 2001 Pennsylvania Stormwater Management Symposium. http://www.opp.psu.edu/environment/stormwater/CN-paper.pdf

Protecting the Clean Water Supply of Montgomery County

and the Washington Metro Area

Ten Mile Creek Watershed – Principal Water Source for Little Seneca Lake, Montgomery County's and Metro Washington's Clean Water Supply, as well as the Maryland Sole Source Aquifer Supplying Montgomery County Rural Wells

Clean Water Resources for Health and Secure Economic Development

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September 9, 2013

September 9, 2013

MCP-Chair@mncppc-mc.org
The Honorable Francoise Carrier
Chair, Montgomery County Planning Board
Silver Spring, Maryland 20910

Subject: Ten Mile Creek Area Limited Amendment - Clarksburg Master Plan

Dear Chair Carrier and Commissioners,

Thank you for this opportunity to comment on the above Amendment and related draft Staff Report. I moved to Montgomery County from Colorado in 1977 and have lived in Bethesda, North Potomac and currently in Gaithersburg. I have been a senior executive or partner in businesses located in Maryland, Virginia and the District of Columbia, and served for many years on the City of Gaithersburg Economic Development Committee. I have consulted on economic development for state and local governments and universities in over 20 states, including San Jose and Los Angeles, California and Austin, Texas.

The Planning Board's forthcoming decision on development in the Ten Mile Creek watershed should be informed by the repeated loss of healthy streams with clean water in Montgomery County over the past five decades as Montgomery County became increasingly developed. Only one major high quality stream wholly contained in Montgomery County is left – Ten Mile Creek.

In the past 50 years as the County transitioned from heavily agricultural land uses to the largely urban-suburban communities of present, Montgomery County, on balance, used an informed approach to land use. We also have vigorous economic development that is the envy of knowledgeable people all over the country with accompanying bountiful job opportunities.

However, that transition cost us dearly in terms of the clean water resources that our County enjoyed in its many streams and creeks in the not-to-distant past. The land use approaches of the past fifty years failed to conserve and preserve our healthy streams and creeks, and the clean water they supplied.

This is true even though County planners and elected officials had the foresight to preserve major agricultural areas of the county in the Ag Reserve, again the envy of so many jurisdictions. That preservation, along with other land use planning initiatives and practices, contributed to a quality of life that attracts and retains our fellow County residents. It is not just our tremendous public schools or medical research institutions that make our County desirable and competitive relative to other jurisdictions in our metro area. Our County's quality of life, including proximate natural resources and beauty, has been better sustained, preserved and maintained than in most of the otherwise impressive local area jurisdictions with which our County is often compared.

Now we confront development pressures that unequivocally threaten the last major high quality creek in Montgomery County. Its water is remarkable clean, its aquatic life diverse and abundant. It prominently feeds the backup water supply (Little Seneca Lake) for 3 million people in the Metro D.C. area, not just Montgomery County. We regularly use that backup supply to obtain clean water in periods of drought and low Potomac River levels. We are likely to draw from it as our backup water supply on increasing occasions as climate change brings about more severe weather including increased periods of drought. In addition, the Ten Mile Creek watershed is a principal water source for the Sole Source Aquifer that keeps rural wells supplied in our County.

We need to ask what happened to the rest of the wonderful streams in Montgomery County in the past 50 years. Those who fail to keep the past in mind are bound to commit the mistakes of the past.

What lessons should we have learned from past development and related stream valley and stream conservation efforts in Montgomery County? It appears that every year, for many years and into the foreseeable future, Montgomery County and its water utility spend and will continue to spend millions of dollars remediating streams that have been severely degraded by residential or commercial development. The mitigation techniques thought *at the time* to be adequate have failed to achieve the desired resource conservation. Streams have been consistently degraded – banks eroded, aquatic life curtailed and water quality impacted. Our water utility is spending tens of millions of dollars extending intake pipes further into the Potomac River because Montgomery County streams are increasingly polluted. Those are costs that taxpayers and ratepayers bear because of damage caused by development in our watersheds.

At this juncture there are certain planning techniques (e.g., Environmental Site Design) thought by some to hold the promise of preventing substantial stream degradation. However, should we entrust the future of this invaluable natural resource to unproven, untested assumptions about the effectiveness of these techniques *in the short- or long-run*? The effectiveness of those techniques has not been studied or proven in a watershed-wide context so there is, admittedly, insufficient data to predict their effectiveness in the sensitive Ten Mile Creek watershed. Moreover, the Planning Staff report and the underlying technical consultant studies concede and assume there will be significant degradation of water quality in this sensitive watershed even if its most stringent staff recommendations are adopted. The report does not contain an option that will *assure* no degradation of Ten Mile Creek will occur.

Good intentions are not enough, historically or presently. The prudent course, unquestionably, is to avoid the likely prospect of substantial degradation of this resource by adopting plan amendments that do not allow further residential or commercial development in the Ten Mile Creek watershed. Because this creek is adjacent to wonderful parkland, the prudent thing to do is to incorporate Ten Mile Creek into the parkland so that County residents have a fully conserved, contiguous (as possible) parkland resource running from Black Hill Regional Park to Little Bennett Regional Park.

Such a resource for water conservation and recreation is a far better return on investment than are an additional 500 to 1,000 unit residential neighborhood and several immense outlet store malls or office parks developed in this sensitive watershed including its headwaters. Those residential or commercial development uses will work at *innumerable* other locations that do not have an adverse impact on a unique natural resource. Their aggregate economic development benefit is extremely small in relation to the irreversible damage they will do to this pristine watershed. *Conserving this watershed is a far more cost effective way of ensuring our clean water supply than would be purchasing enormous tracts of land near distant lakes or reservoirs as numerous jurisdictions have been forced to do or struggling to remediate degraded streams after-the-fact.*

Protecting this water resource in or adjacent to the Ag Reserve would also be an economic plus for the County. Our County competes with other areas of the country for business and technical talent that is attracted by the positive quality of life it has preserved and fostered. The Ag Reserve, C&O Canal National Park, Potomac River, County parks, and exceptional tree canopy, along with regional features such as the Chesapeake Bay and Appalachian Trail, all help our County businesses attract the talented workforce that fuels our economic growth. People who are recruited to live and work in Silicon Valley, the Boston tech corridor, or Austin, Texas, for example, tend to value quality of life highly in making relocation decisions. Our favorable quality of life gives us a competitive advantage that we can easily

lose if we develop our countryside in the wrong places, as some other D.C. area jurisdictions have allowed.

What message do we send about our County's quality of life to the increased population and competitive workforce we seek to attract if we continue to abuse our water supply and let the main flow for our region's backup water supply and rural wells substantially degrade? No rational actor would give up its clean water supply for one more fungible housing development or one or two more fungible outlet shopping malls or office parks, readily locatable outside this sensitive watershed.

I urge the Board to be a strategic, good steward of our clean water supply, our quality of life, our tax and ratepayer dollars, and our competitive economic position by modifying the Plan only in ways that *assuredly* conserve the watershed of Ten Mile Creek. The only way to do that is to avoid further development in this sensitive watershed. Anything else will result in degradation of Ten Mile Creek that we will pay for in the future and will diminish irretrievably a wonderful and important natural stream water resource.

Respectfully yours,

Alfred M. Wurglitz

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Water Resource Lessons from 187 years ago in Montgomery County, Maryland

National Park Service Historic Sign at Violette's Lock on the C&O Canal Near Inlet Lock 2 and Lift Lock 23

"Life on the canal depended on water. To ensure a steady supply of water, the canal company built seven dams and a steam pump along the river. In times of drought or low water, usually during the height of the summer, river levels could drop dramatically. When the canal could not get enough water from the river, boat traffic stopped. This caused a loss of revenue for the canal company and the loss of a living for the boat captains." (Emphasis added.)

Pictorial Tour of Ten Mile Creek

A Walk Up our Last Clean Water Stream

July 2013

Montgomery County, Maryland