

SUPPORTING DETAIL FOR COMMENTS BY THE TOWN OF CHEVY CHASE ON THE APPLICATION BY THE MARYLAND TRANSIT ADMINISTRATION FOR WATER-RELATED PERMITS AND §401 WATER QUALITY CERTIFICATION FOR THE PROPOSED PURPLE LINE LIGHT RAIL PROJECT

Adverse water-related impacts are already now experienced within the Town from the to-be-filled waterways and the area comprising the right-of-way for the proposed eventual Purple Line

1. In recent years, high stormwater flows that are nearly instantaneous with heavy precipitation events occur into Coquelin Run that threaten to exceed the capacity of the pair of pipes/culverts that convey Coquelin Run downstream within the Town, first under Lynn Drive and then under Tarrytown Road and continuing under Zimmerman Park. The majority of this stormwater flow comes through a pipe under the Georgetown Branch Interim Trail (GBIT) that discharges through a 24" cast iron outfall just below and to the south of the Trail, dropping several feet into a pool, and then flows about 60 feet through residents' yards to join Coquelin Run proper. (The segment of Coquelin Run upstream of this confluence has its origin at Elm Street Park and flows through the back yards of properties in the Town of Chevy Chase along the North/West sides of Elm Street, Oakridge Lane and Lynn Drive. This uppermost segment of Coquelin Run appears in recent years to have perennial rather than intermittent flow.) During and soon after precipitation events, the stormwater flow from this cast iron pipe outfall (we will refer to this important outfall as the "GBIT culvert") greatly exceeds the combination of base flow and additional stormwater flow from the uppermost segment of Coquelin Run. The adverse impacts experienced by Town residents from the current level of stormwater flows from the GBIT culvert include:

- Scoured streambed and incised/eroded/destabilized streambanks in the relatively short stretch of Coquelin Run from the GBIT culvert pool to the final pipe/culvert under Tarrytown Road.
- Undercut and deteriorated rock and concrete bases on which the Lynn Drive and Tarrytown Road culverts rest. The owners of the property at 7508 Tarrytown Road have had to pay for repairs to shore up the eroded base under this culvert.
- Threatened flooding of the properties at and immediately upstream of these two Coquelin Run culverts. Within the past several years, stormwater flows on occasion have been sufficiently high as to overtop and exceed the capacity of the culverts. Pictures are available to document this.
- Deposition of trash, large branches and other debris along the streambed and banks.

- Although unlikely to occur, there is danger of serious injury or death if someone were to fall into or otherwise be caught in the channels immediately upstream of these culverts during high storm flows. The owners of the property at 7508 Tarrytown Road, for example, have had to fence their property extensively in an attempt to prevent children playing ball adjacent to the Tarrytown Road culvert from chasing an errant ball that might fall into the channel just above the culvert. A child falling into that channel during stormwater flows could be pinned against the culvert or swept into it, with injury or death likely. Children have also reportedly entered the long underground culverted portion of Coquelin Run at East-West Highway and crawled upstream in the culvert for some distance. It's unlikely, but if they were to encounter a surge of stormwater during such an activity the result could be fatal.

2. Sheet and rill erosion at several points along the south side of the current GBIT through Town residents' back yards (properties along the North/West sides of Elm Street, Oakridge Lane and Lynn Drive) and into the uppermost segment of Coquelin Run. Adverse impacts from this now include:

- Sedimentation and urban runoff resulting in degraded water quality in this uppermost segment of Coquelin Run.
- Saturated areas and unsightly erosion channels in back yards.

3. Adverse impacts on downstream water quality from sediment, debris, and perhaps other pollutants from the urban runoff from and across/under the Georgetown Branch Interim Trail.

- This water quality degradation could perhaps be considered an adverse impact largely downstream of the Town and thus perhaps not a concern to be addressed in our comments.

These currently experienced adverse impacts, mostly from stormwater flows down the to-be-filled waterways and from and across the Purple Line right-of-way, will likely increase with construction of the Purple Line as presently designed

We believe that the current design for the Purple Line and further development in Bethesda pursuant to the Pearl District portion of the Bethesda Downtown Plan¹ will result in increased

¹ We include Pearl District development plans in this discussion because much of the stormwater flows from the Pearl District are now collected and routed from north to south in various conveyances (primarily the to-be-filled channels) and eventually through a pipe under the Purple Line right-of-way (ROW) and then to an outfall at the GBIT culvert. Both the pipe under the ROW and the outfall are to be reconstructed and modified under the applicant's proposal, with the pipe and outfall to be doubled in diameter (thus quadrupled in capacity) for reasons that have not been explained; perhaps, we surmise, to accommodate expected increased future stormwater flows.

future stormwater flows into Coquelin Run, with potential adverse impacts likewise increasing proportionally. We believe that stormwater flows into the Town will increase for three reasons.

First, the runoff from precipitation falling directly on the Purple Line right-of-way (ROW) and associated areas disturbed by the project will increase with construction of the project as currently designed. Judging from the cross-sectional map provided on page 12 of the Public Notice materials, the to-be-disturbed area in this segment of the Purple Line consists at present of 10 - 15 feet width of compacted gravel trail (relatively pervious²) and roughly 80 feet width of mostly pervious, mostly vegetated, areas – trees, shrubs, grass, etc.³

Any increase in flows through this outfall will exacerbate the flooding and other damages that have occurred downstream of this point. An increase that approaches a quadrupling -- as might be suggested by the planned increase in the size of the outfall -- would pose very serious problems if it were to occur.

Some of the stormwater flow from precipitation on the current GBIT also joins the Pearl District flow in now being routed down the to-be-filled channels, then under the Purple Line ROW and to the GBIT culvert, but the Pearl District flows appear to greatly exceed the GBIT flows. The GBIT culvert outfall pipe receives the flow from an area of as much as 28 acres north of the GBIT that corresponds closely to the Pearl District -- an area bounded on the south by the Georgetown Branch Interim Trail and to the north including a portion of Wisconsin Avenue and following along East-West Highway, ending where East-West Highway intersects with the existing GBIT. In contrast, only perhaps about half of the GBIT surface area – much less than one acre in total -- now drains to the GBIT culvert (mostly the northern half of the GBIT, while the southern half drains largely directly southward toward the uppermost segment of Coquelin Run).

Unless there is to be a major re-working of the storm sewers throughout the Pearl District, with the proposed filling of the channels the Purple Line project will need to include infrastructure that continues to manage flows from both the Pearl District and the GBIT/Purple Line ROW. If flows from the Pearl District will increase in the future, infrastructure associated with the Purple Line segment just north of the Town of Chevy Chase must be designed to handle these increased flows as well as the increased flows from precipitation on the Purple Line ROW.

² The relatively pervious nature of the current GBIT surface in this area is suggested by conditions observed recently along a low-lying portion of the trail just to the west of the underpass under East-West Highway. The trail in this area is depressed, sloping downward from the southwest and upward to the northeast and bounded on both sides by high banks. If the trail surface were relatively impervious, precipitation falling onto a substantial length of the trail could thus be expected to flow into and collect/pool in this relatively short low-lying segment of the trail. However, the trail is quite pervious, and water does not pool here as would be expected if it were impervious. For example, during the four-day period from September 29 through October 2, 2016, when roughly 3 inches of rain fell in Bethesda, no pooling of water was observed in this area of the trail during any of four visits.

³ See the cross-section exhibit titled “Stream Impact WUS GB-1 Station 118+00” (Cross-section sheet No. 1 of 22). This shows a 96 foot width for the Limit of Disturbance (LOD) at this point, from -63 feet to +33 feet. We understand that construction of the Purple Line will involve “disturbing” an area that in most locations is wider than the right of way. The land-disturbing activities -- removal of trees and other vegetation, grading, soil compaction, equipment access, temporary construction activities, etc. -- will generally result in the total area within the LOD being on average less pervious after construction of the Purple Line than it is now. We believe that the assessments that will be performed by the MTA’s engineers and reviewed by MDE to compare perviousness before and after Purple Line construction (e.g., calculations to estimate the impervious area requiring treatment -- IART) and calculations to estimate the stormwater flows that will need to be managed -- should be done in a realistic manner and should assess the degree of perviousness of the entire LOD area, not for only the ROW or for

After construction of the Purple Line, the now relatively pervious ROW and to-be-disturbed area will become less so. Again judging from the cross-sectional map, the area within the LOD after Purple Line construction will consist of 12 feet width of impervious paved trail, 30 feet width of dual track ballasted light rail roadbed, several feet width of walls and other impervious masonry, and roughly 50 feet width of other areas that will be less vegetated and more compacted and thus less pervious than currently.

Notwithstanding the technical direction provided in 2012 by MDE to MTA to the effect that ballasted roadbed shall be considered “pervious” for the purpose of stormwater volume calculations, the literature that we have found on this subject indicates that the subgrade beneath ballasted rail track bed is typically highly compacted and the combination of ballast, sub-ballast and subgrade/soil beneath the track will act as a relatively impervious rather than pervious system.⁴ As this segment of the Purple Line is now planned, precipitation that falls onto the ballast layer will drain very quickly to the sub-ballast, within which the MTA proposes to install a trunkline that will convey the stormwater flows now conveyed in the to-be-filled channel adjoining the GBIT to the north. The trunkline will also function as an underdrain for the dual track rail bed. Stormwater will not infiltrate to the compacted subgrade/soil below the sub-ballast to any significant degree, but will instead flow eastward in the new trunkline, then to be discharged through the GBIT culvert and outfall. Although the ballast itself will be highly pervious, the several components beneath the track together will function as an impervious unit, with precipitation quickly moving horizontally down-gradient rather than percolating vertically downward below the sub-ballast. The rapidity with which this stormflow will reach the outfall will depend on the volume of gravel that is added for storage/detention below the underdrain.

Comparing the various components of the roughly 95 feet wide LOD area after Purple Line construction against the various components now, we anticipate that completion of the Purple Line as currently designed would result in a reduction in permeability of the LOD area as a whole and thus an increase in stormwater flows from this surface area when there is precipitation:⁵

only the width of the trail. This is particularly important given the damages that already occur within the Town, including flooding, from stormwater flows from and across/under the to-be-disturbed area.

⁴ References will be provided on request.

⁵ The MTA and its contractors have developed calculations in a large 12-volume publication titled *Purple Line Concept Stormwater Report* (Revision 2, November 2013) that appear to estimate stormwater flows both before and after construction of the Purple Line for each segment of the line, including the segment along the northern border of the Town. The analysis concludes that the combination of specific stormwater treatment and management measures included in the design as of November, 2013 (thus including the subsequently abandoned “Green Track” for this segment) and a specified level of off-site mitigation involving water bodies not within the

- 12 feet in width of the LOD area will be converted from the pervious GBIT trail surface now to paved, impervious permanent Capital Crescent Trail surface.
- 30 feet in width of the LOD area will be converted from its currently relatively pervious condition (i.e., additional GBIT trail surface and shoulders, and varied, mostly vegetated surfaces) to light rail trackbed, which, depending on the volume of underdrain gravel storage that is provided, will behave in a more or less impervious manner.
- Some 50 feet in width of additional LOD area that will change from mostly vegetated and pervious now to less vegetated, more compacted and more impervious after construction of the Purple Line

A second reason why stormwater flows will likely increase into Coquelin Run and the northern portion of the Town after construction of the Purple Line involves expected growth in the Pearl District of Bethesda. Further development and density in the Pearl District of Bethesda consistent with the likely soon-to-be-approved Bethesda Downtown Plan will probably increase the percentage of impervious cover in this drainage area, thus also increasing stormwater flows from the north into the Purple Line ROW. The Purple Line will provide the infrastructure to collect these flows as they arrive at the ROW, to convey them along and then across/under the ROW, perhaps to store, detain or treat them, and then to discharge them into or toward Coquelin Run. The Pearl District drainage area is now largely impervious surface, but there are some pervious areas of grass and loose gravel among some of the properties along Montgomery Avenue and East-West Highway. These pervious areas will likely be reduced and stormwater flows increased as development in this portion of Bethesda grows in the future.⁶

Purple Line drainage will be sufficient to meet all applicable governmental stormwater and water quality requirements (including Maryland's requirement to provide Environmental Site Design – ESD, consisting of on-site stormwater reduction, treatment and detention – to “the Maximum Extent Practicable”). We have not yet reviewed these calculations. They will need to be revised to reflect the current Purple Line design which, in addition to abandoning the previously planned Green Track, may also include other important changes. The MTA should make a current version of the *Purple Line Concept Stormwater Report* publicly available so that we and others have a full opportunity to review and comment.

We do not know whether an edition of the Concept Stormwater Report exists that is newer than the November, 2013, edition that we have. MTA has not made any edition of the Report publicly available. The November, 2013, edition and appendices were obtained as a result of a Freedom of Information Act request.

⁶ This likely increase in future stormwater flows could perhaps be reversed if the potential park along the southern side of lower Montgomery Avenue were to be implemented, particularly if the park were to include stormwater management/treatment facilities as was suggested in an early version of the Staff Draft of the Bethesda Downtown Plan.

A third reason why construction of the Purple Line will increase harmful stormwater flows into the Town involves the plans for POI 2 as described in the *Concept Stormwater Report*. MTA plans to shift the drainage from much of Elm Street Park to flow into the new storm drain trunkline under the new trackbed and eventually thus to the GBIT culvert (POI 4) rather than flowing as currently down a ditch south of the GBIT. The current flow down the ditch likely infiltrates or seeps toward the origins of Coquelin Run east of Elm Street Park. We have not observed any discharge from this ditch, even in very rainy weather. In MTA's estimation, this change simply shifts runoff from the head of Coquelin Run now to a point further down Coquelin Run after the Purple Line is constructed. In our opinion, this shift likely adversely affects interests in the Town. Any drainage from Elm Street Park that now reaches the upper end of Coquelin Run, whether infiltrating directly from the Park or seeping/infiltrating after traveling down the ditch, seems likely to be beneficial – it probably arrives in Coquelin Run as subsurface flow rather than surface sheet flow and serves more as relatively consistent base flow than as “flashy” stormwater flow. It is substantially detained and well filtered by travel through many feet of soil and is likely a relatively clean additional source for Coquelin Run. On the other hand, re-routing the storm drainage from Elm Street Park instead to add it to the flows down the Purple Line and directly and quickly to the GBIT culvert would seem to exacerbate the existing problems posed by storm flows through the culvert.

MTA identifies in the 2013 *Concept Stormwater Management Report* several more changes in how stormwater from the Pearl District and Purple Line LOD drainage area will be routed to the GBIT culvert, and proposes in that document a set of ten on-site ESD facilities that will treat this stormwater to the maximum extent practicable as required under Maryland law. These proposed facilities include nine small bioswales located where space allows between the trail and Purple Line trackbed that will treat sheet flow from the trail, and green track plus gravel reservoir storage below the underdrain that will presumably manage flow from the trackbed. MTA provides a set of calculations in the *Concept Stormwater Management Report* showing how this group of measures will manage stormwater from the Purple Line project sufficiently well to meet all applicable regulatory requirements. (Though MTA further calculates in this edition of the *Concept Stormwater Management Report* that the treatment measures proposed for this segment of the Purple Line and for the Purple Line as a whole will not meet MD water quality requirements regarding net reductions in impervious surfaces, and MTA commits to providing an appropriate quantity of offsetting off-site compensation.)

We have not reviewed these calculations and whether they support the MTA's conclusions that the proposed project design will meet all applicable water-related legal requirements. The calculations and conclusions in the 2013 document are outdated in the sense that the MTA's current plans for stormwater management along this segment of the proposed Purple Line no longer include green track, and may now include fewer proposed bioswale units than previously

(for example, the segment maps included in the Public Notice show only two or three bioswales, not nine.) As per the 2013 report that we have, the now-abandoned green track accounted for about half of the total ESD provided by all of the management measures included at that time. For the moment, our opinion to the effect that construction of the Purple Line as currently planned will increase harmful stormwater flows into the Town is based on the reasoning and facts outlined above.

Another stormwater issue is of lesser importance, but still worthy of attention. MTA appears not to recognize the problems posed by current sheet and rill flows from several points along the Georgetown Branch Interim Trail directly downslope to Coquelin Run behind Elm Street in the Town. These flows may increase with a more impervious trail and Purple Line LOD area relative to the largely pervious nature of the ROW that exists now with the GBIT. MTA proposes no measures associated with the Purple Line to address this issue and says in the 2013 report only:

“EXISTING CONDITIONS

... The Southern half of the Capital Crescent Trail discharges to Coquelin Run through the heavily wooded stream bank. ...

PROPOSED CONDITIONS

... The underdrain from the South side of the track discharges through the face of the [proposed retaining wall along the southern edge of the Purple Line ROW] ... in order to maintain the existing drainage patterns.” (*Stormwater Concept Report*, page 57)

In our view, though, the existing drainage patterns to the south of the GBIT are not ideal, and the Purple Line project should seek to improve rather than maintain them (or worsen them, as seems likely, given that the proposed Purple Line will both reduce the existing “heavily wooded” area south of the GBIT and eliminate the berm and depression along stretches of the south side of the GBIT that currently prevent precipitation on the trail in these stretches from running off directly overland to Coquelin Run).

These projected adverse impacts from the proposed waterway fill and the replacement infrastructure are not unavoidable or inevitable with construction of the Purple Line. To the contrary, we believe that a variety of practicable on-site and local measures could be incorporated into the Purple Line project plans for this segment that would effectively and directly mitigate the specific adverse impacts that we expect within the Town’s borders. On-site and/or local direct mitigation is much preferable to the applicant’s proposed set of non-local compensatory, “offsetting” actions. The Corps and MDE should condition any permits

and/or water quality certifications for the Purple Line project to require direct and effective on-site and/or local mitigation along the lines that we suggest.

We believe that the MTA should be required to implement a sufficient package of the following sorts of on-site and/or local mitigation measures. We believe that some combination of these measures could be implemented cost-effectively and practicably so as to minimize the projected adverse impacts to water resources, public and private property and perhaps public health within the Town of Chevy Chase.

Additional on-site stormwater treatment and detention measures (beyond those currently proposed) within the Purple Line right-of-way

- Additional gravel storage capacity below the proposed new underdrain.
- More bioswales.
- Pervious pavement for the new Trail.
- Reinstate the previously planned use of Green Track.

“Downstream” measures that MTA might implement, perhaps in cooperation with others

- Stream restoration for the segment of Coquelin Run between the GBIT culvert and the culvert under Tarrytown Road.
- Shore up and perhaps expand the culverts under Lynn Drive and under Tarrytown Road.
- Rip rap and/or other measures to protect the pool into which flows fall from the GBIT culvert.
- Close off the Coquelin Run box culvert at the north side of East-West Highway to prevent human entry.
- Stream restoration for the uppermost segment of Coquelin Run with consenting property owners.
- Repair erosion damage and prevent further sheet and rill flows from the Purple Line right-of-way directly downslope to the uppermost segment of Coquelin Run.

- Eliminate the plans to direct Elm Street Park drainage eastward along and under the Purple Line through the proposed new trunk line (intended largely to replace the current function of the to-be-filled channel just north of the current GBIT).

MTA support for “upstream” stormwater treatment and detention measures within the Pearl District of Bethesda

- Support creation of a park with stormwater treatment facilities on the south side of Montgomery Avenue toward its eastern end.
- Support additional measures within the area: green roofs, pervious pavement, curb cuts, green strips, holding/detention tanks beneath major new buildings, etc.