

The “Water Planning Council’s” Review Pursuant to Public Act 16-61 of the City of New Britain’s Report entitled *Environmental Study: Change in Use of New Britain Water Company Land (Proposed Quarry Expansion and Future Water Storage Reservoir)*

May 29, 2018

Executive Summary

Public Act 16-61, *An Act Concerning An Environmental Study On A Change In Use Of New Britain Water Company Land*, required the City Of New Britain to commission an environmental report to be submitted to the Water Planning Council (WPC), the Council on Environmental Quality (CEQ), and the City of New Britain’s Conservation Commission. The purpose of the report was to examine the potential impact of changing the use of some of its city water department-owned Class I and Class II land to allow the lease of land for the extraction of stone and other minerals on such property.

This extraction operation, which would be done over a period of 35-40 years, could potentially create a new public water supply reservoir of 2.31 billion gallons capacity for the New Britain Water Department. The reservoir would be filled with water from a flood-skimming operation at Coppermine Brook in Bristol, taking an estimated 6-28 months to fill the reservoir from this source. The new water supply reservoir is described in the Executive Summary as being 109 acres in surface area (though other figures are given elsewhere in the Report) and up to 130’ deep.

PA 16-61 charges the WPC and the CEQ with reviewing the report to determine:

- 1) the potential impact on the environment and the purity and adequacy of the existing and future public water supply; and
- 2) to provide guidance to the New Britain Water Department concerning the suitability of the best management practices identified for the protection of the environment, public water supply and public health.

Much of the area that would be impacted in the proposed expanded area of quarrying is located in the active public drinking water supply watershed of the Shuttle Meadow Reservoir. That area also includes rare habitat and, according to the city’s report, the area is also home to a plant species previously thought to no longer to be present in the state.

As will be discussed further, the WPC finds that preparation for quarrying, including clear-cutting the forest and removing the stumps, soil and other natural material, followed by quarry operations, would eliminate much of the wild habitat of the site while creating the potential for decades of increased risk to the city’s nearby Shuttle Meadow Reservoir.

The WPC finds that the city’s report does not substantiate the need for the proposed new reservoir or, in fact, that the proposed reservoir would even be a viable public water storage facility. Based on its review, the WPC finds that the proposal’s risks to the current public water system and the environment are significant and the city’s report does not make a plausible case for undertaking such an activity.

Discussion

The city's report was submitted to the WPC, the CEQ and the City of New Britain's Conservation Commission on 2/27/2018. Specifically, PA 16-61's list of expectations for the city of New Britain's study are to determine:

- I. likely environmental impacts of such change of use on local hydrology, forest ecology, natural land resources and formations, and wetlands systems;
- II. long-term water supply needs for the city of New Britain as well as interconnected, and reasonably feasible interconnected, water companies in the general geographic region surrounding the areas supplied by the city of New Britain's water reservoir system;
- III. likely safe yield increase to the city of New Britain's water reservoir system that could be supplied by such change of use;
- IV. impact on raw reservoir water quality that is likely to occur from such change of use;
- V. procedures and steps that are available to minimize environmental impacts from such change of use; and
- VI. permits required for such change of use

The WPC and CEQ are required to provide their written comments to the City of New Britain not later than ninety days after receipt of the city's report. Where possible, the WPC describes various permitting and regulatory processes likely to apply, but it is important to note that a thorough determination is not possible at this time given the limited scope of the report and, therefore, this review.

Impact on the Existing and Future Public Water Supply

One of the WPC's key concerns regarding the report is the discrepancy in the analysis of New Britain Water Department's (NBWD's) future supply capacity when compared to the NBWD Water Supply Plan and the Water Utility Coordinating Committee (WUCC) Integrated Report. This report identifies a number of losses of safe yield in the long-term planning periods that yield a margin of safety significantly lower than the other planning documents. These projected losses are inconsistent with other existing plans and the report provides no documentation or analysis to substantiate the figures.

The city's Water Supply Plan and the WUCC Integrated Report show that the New Britain Water Department has excess water supply with respect to demand now and through the 50-year planning period, even using the increased demand projections provided by Lenard Engineering, without a new reservoir. The city's report relies upon the confluence of a series of speculative and undocumented contingencies relative to both water demand and supply occurring in unison in order to justify the need for a new reservoir. The chance of all of these contingencies occurring is extremely remote. Therefore, the need for this 2.31 billion gallon storage reservoir has not been documented.

Much of the area that would be impacted in the proposed expanded area of quarrying is located in the active public drinking water supply watershed of the Shuttle Meadow Reservoir. Surficial activities associated with the quarrying operation, including clear-cutting the forest and removing the stumps, soil and other natural material could create a significant water quality risk to the reservoir. The report does not adequately document how this operation will be conducted. There is no information as to whether this process will be done incrementally or immediately, nor what protections will be instituted. It appears that there is a potential for decades of increased risk to Shuttle Meadow Reservoir, without adequate analysis of potential impacts to water quality and quantity.

Impact on the Environment

There are multiple significant environmental issues and impacts which arise in connection with the proposed quarry/ reservoir. These fall chiefly within the categories of core forest impacts, vernal pool and wetland impacts, impacts to State-listed species, relocation of the Metacomet Trail and inconsistencies with the Connecticut Water Quality Standards.

The proposed project site lies within a 1,000-acre block of core forest. Core forest, defined as interior forest blocks of 250 acres or more that are at least 300 feet from non-forested areas, have been severely impacted by development and fragmentation in Connecticut. Due to the many values they serve, particularly for wildlife habitat but also for recreation and for protection of water quality, core forests have been targeted for preservation by Connecticut DEEP. Core forest blocks of this size are particularly valuable in the more developed parts of the state such as central Connecticut, where this project is located.

Within and immediately adjacent to the project site are eight vernal pools and ten wetlands, with five of the vernal pools being located within the wetlands. The project would eliminate over one-third of the wetland acreage on the project site as well as three of the eight vernal pools including the most valuable one. The Report is almost completely silent on measures to mitigate or compensate for these losses and it would be difficult, if not impossible, to implement meaningful mitigation or compensation measures given the hydrology and topography of the site.

Three State-listed species of special concern, namely the eastern box turtle, the spotted turtle and the Jefferson salamander, would be impacted by the development of this reservoir. In addition, four plant species currently known only from historic records may occur on this site, and one of these, last reported in Connecticut in 1879, was identified on the project site within the footprint of the reservoir.

Several hundred feet of the Metacomet Trail, part of Connecticut's Blue-blazed Trail system, would need to be relocated should the reservoir be constructed. There is likely to be a suitable alternative alignment available to accomplish this. No impacts to Sunset Rock State Park, which is a short distance west of the project site, are anticipated.

Due mainly to the biological impacts of the proposed action, the project is inconsistent with the Connecticut Water Quality Standards which seek to "restore or maintain the chemical, physical and biological integrity of surface waters".

Procedures and Steps to Minimize Environmental Impacts

Mitigation measures to reduce the environmental impacts of the proposed action are not addressed in any substantive way in the Report. There is no discussion of the phasing of the reservoir construction, whether land clearing and soil stripping activities for the project would be done all in one operation or phased over time, or any measures to mitigate or compensate for the loss of wetlands, vernal pools and habitat resources. Alternatives to reduce or reconfigure the reservoir to lessen impacts are not considered. As such, the mitigation section of the Report is severely inadequate.

Permits Required for the Proposed Action

The proposed action may require several State permits and possibly a Federal permit also. These would include a Water Company Land Change in Use Permit, approval of a new drinking water source, and approval of certain ancillary facilities from DPH, a General Permit for the

Discharge of Stormwater and Dewatering Wastewaters from Construction Activities from DEEP, as well as DEEP-issued Diversion Permits for 1) the alteration/elimination of existing wetlands and watercourses on the site, 2) for the use of the waters of Coppermine Brook to fill the proposed reservoir and 3) for withdrawals from the new reservoir once it is in use. In addition, the Army Corps of Engineers may require a Section 404 Permit which, if needed, would also trigger the need from a Section 401 Water Quality Certification from DEEP.

The following findings are organized in accordance with Sec. 1(b) of PA 16-61's list of expectations:

I. Likely environmental impacts of such change of use on local hydrology, forest ecology, natural land resources & formations, and wetlands systems

Habitat Quality at the Proposed Site

Forest Habitat

Chapter 7 of the Report does a comprehensive job of describing the habitat value of the project site. First, the project site is described as being within a 1,000-acre block of core forest. Core forest is a valuable habitat type which is diminishing across Connecticut, and core forest blocks of this size are rare in Central Connecticut.

The University of Connecticut Center for Land Use Education and Research's (CLEAR) study found that between 1985 and 2006, Connecticut lost 160,960 acres of core forest to housing, development and other uses. As noted in DEEP's *Connecticut Comprehensive Open Space Acquisition Plan (2016-2020)*, also known as the *Green Plan*, which is discussed below, if forest development continues at this pace, the landscape's ability to function will be dramatically reduced. For this reason, core forest land is targeted for preservation in the *Green Plan* and the *Forest Action Plan* by the State of Connecticut and its conservation partners such as land trusts, municipalities and water companies.

Connecticut's core forests, defined as interior forest blocks of 250 acres or more that are at least 300 feet from non-forested areas, have been severely impacted by development and fragmentation. DEEP's *Forest and Wildlife Action* plans as well as the *Green Plan* call for the retention and protection of core forests. The larger the core forest, the greater value and function of the many attributes of a core forest. Reducing the size of the forest blocks greater than 250 acres has a material effect on that core forest.

The functions and value of core forests are discussed in the *Green Plan*. The *Green Plan* is a statewide planning document developed by DEEP in partnership with other state agencies, municipalities, state agencies, and numerous conservation organizations to guide land acquisitions toward achieving the State's open space goals. The 2016-2020 version of the *Green Plan* presents a coordinated approach for land conservation by the State of Connecticut, through DEEP, DPH, and conservation partners such as municipalities, land trusts and water companies.

Relative to large forest blocks, the *Green Plan* notes their value, highlighting that "Large-scale and intact forests provide key habitat linkages for common and declining wildlife species, such as thrushes and owls, bobcats, numerous insects, and newts and salamanders. In addition, forests add immensely to the quality of life for the state's residents. The ecosystem benefits this system provides are seemingly endless- forests absorb rainwater and slow runoff, reduce flooding, filter pollutants from the air, water and soil, regulate air temperatures, supply outdoor recreation opportunities, and more."¹

Lastly, the DEEP Forestry Division updated the *Forest Action Plan* in 2015. As the *Forest Action Plan* describes, core forests are important for protecting biodiversity. While core forests provide habitat for many species including generalists that can also use non-core forest and non-forest habitats, some species need large, unbroken blocks of core forest to provide cover,

¹ Connecticut Comprehensive Open Space Acquisition Strategy (2016-2020), Connecticut Dept. of Energy and Environmental Protection, p. 121.

forage, and breeding opportunities. Many threatened and endangered species prefer or need large areas of core forest to survive and, as this habitat type is reduced, it becomes harder to keep or reestablish these species. While the total amount of forest is declining in the state, core forest is declining much more rapidly because, in addition to core forest being developed, core forest is also being lost as nearby development turns it into edge or perforated forest, which in turn diminishes some of its value as habitat and its ability to protect biodiversity.

Connecticut's development pattern continues to threaten core forest by encroaching on these important areas from all directions. Once core forest is lost, it is not easily or quickly regained or replaced in other areas so one of Connecticut's 10 Forest Vision Statements states that "in the future, Connecticut will increase the amount of forest protected from development following priority criteria based on core forest areas, Forest Legacy potential, and vulnerability." While still difficult, it is much easier to protect and conserve core forest than it is to create new core forest. The Society of American Foresters believes that "continued declines and fragmentation of the forestland base may lead to the impairment of our forest ecosystems' ability to protect water flow and quality, to provide healthy and diverse forest habitat, and to remain a viable economic resource that provides recreation, timber, and other forest products."

Vernal Pools

The habitat value of the proposed reservoir site is further enhanced by the eight vernal pools found on or immediately adjacent to the site. Due to the vulnerable nature of these uniquely productive habitats, conservation of vernal pools has been included as a high priority action within the 2015 Connecticut Wildlife Action Plan.

Vernal pools are small, shallow depressions in the landscape which fill with water during the wetter periods of the year (spring and late fall), and become drier during the warmer summer months. They support unusually diverse and dynamic assemblages of wildlife much of which is solely dependent on this specialized habitat for one or more periods of their life cycle. Because of the absence of permanent water, fish do not live in these ephemeral pools, making these areas very attractive to certain animals, particularly amphibians, which would normally fall prey to these carnivorous fish.

The amphibian life that use these pools as breeding grounds soon migrate into the surrounding uplands to live out their adult phase. Migration distances vary significantly between species, commonly ranging from 200 feet to a maximum of 750'. Another phenomenon peculiar to vernal pools is that they often exist, as in this case, in groups, which have been shown to function as an interrelated unit, with the interplay between the pools in the group crucial to their long-term biological survival.

In general, the city's vernal pool report methodology is acceptable and its conclusions are sound. All eight vernal pools were found to be of Tier 1 quality, the highest rating, due to the presence of two or more indicator species in each. One such species, the State-listed Jefferson salamander, is particularly vulnerable within the trap rock ridge system present at this site due to their relatively low populations found within these systems.

The impact analysis on the vernal pools presents a stark picture. Of the five vernal pools on the site, three will be destroyed, including the most productive and valuable one, PVP 3. Vernal pools 4 and 5 will also be disturbed. The two on-site vernal pools not directly affected, PVPs # 1 and 2, are the largest, but these pools would see losses to their areas of critical terrestrial habitat, the area within between 100' and 750' of the vernal pools which hosts the non-breeding habitat used by vernal pool-dependent species. There would be minor indirect impacts to the three studied off-site vernal pools

immediately south of the project parcel (PVPs # 6-8), with the loss of 9-19% of their critical terrestrial habitat areas.

The city's report recognizes the concept of amphibian meta-populations, i.e., the migration and interaction of amphibian populations between proximal vernal pools. The report foresees impacts to this function as the loss of vernal pools 3, 4 and 5 would operate to disconnect vernal pools 1 and 2 from pools 6, 7 and 8. An upland migration study during the migration season can assess where the amphibians are dispersing after breeding and determine how the upland, inter-pool migration out of the remaining post-project pools might be affected if vernal pools 1, 2 and 6 were to lose significant amounts of their critical terrestrial habitat.

Another indirect impact on the vernal pools would be affected hydrology after excavation. Pools 1, 2, and 6 are close to the proposed excavation limits which might cause draining of the pools resulting from altered groundwater hydraulic gradients. However, Leggette, Brashears and Graham's hydrogeologic study concluded that, as expected, the pools receive most of their water from overland flow and precipitation, with little or no groundwater contributions. This is supported by the fact that the highest value pool (#3) also is the closest to the existing quarry face (75'). All pools not destroyed are topographically higher than the nearby excavation limit and would continue to be fed by runoff and precipitation.

In general, construction should avoid vernal pools and, should this project move forward, impacts could be significantly reduced by reconfiguring excavation limits to avoid elimination of highest value vernal pool (PVP #3) and its critically necessary 100-foot vernal pool envelope. This could also serve to avoid impact to the western occurrence of the listed species Fir Clubmoss/Coastal Jointweed. The efficacy of this plan alteration would be further informed by the meta-population migration study mentioned above.

Regarding wetlands in general, of the 13.5 acres of mapped wetland on the site, 4.7 acres or 35% will be eliminated, and the largest one not eliminated (Wetland 4) will have its contributing hydrology severely reduced (44%) by excavation. Mitigation plans for this loss are totally underdeveloped, with only a passing reference to wetland creation (the least preferred mitigation method) that could be performed on unaffected portions of the site. Wetland/vernal pool creation would be a considerable challenge given hydrologic/topographic constraints i.e., shallow soils, no groundwater budget. Off-site compensation items are not discussed in the Report.

Impacts to State-Listed Species at the Project Site

Chapter 7 of the Report discusses impacts to four State-listed species found at the site: eastern box turtle (*Terrapene carolina carolina*), spotted turtle (*Clemmys guttata*), Jefferson salamander complex (*Ambystoma jeffersonianum*) and fir clubmoss, also known as mountain firmoss (*Huperzia appressa*). The first three are species of special concern while the last is a species of special concern- (historic).

The Report adequately describes the locations supporting these species. With the exception of suggesting that suitable off-site habitat for eastern box turtle could be created by doing some selective clearing to create canopy openings, the Report is silent on mitigation and protective strategies. To a large extent, mitigation strategies are not realistically available for any of these species as they are very attached to the specific site locations where they are found. When the site vernal pools, wetlands, or, in the case of fir clubmoss, summit outcrops in dry, sub-acidic forest environment, are destroyed, there is no reasonable mitigation strategy to relocate or protect individuals of these species. The fir clubmoss, discussed on pages 7-8 and 7-24 of the

Report, is cited as being a species of special concern. As noted above, it is more accurately a species of special concern (historic), meaning the State has no NDDDB records of any current population, and this plant is considered extirpated in Connecticut. The last known observation of it was in 1879 in the West Rock area of New Haven. Other New England occurrences of fir clubmoss, or mountain firmoss, are in western Massachusetts, Vermont, New Hampshire and Maine, and it is listed as rare or extremely rare in those areas. Page 7-24 of the Report notes that the two locations where this plant was seen are within the proposed quarry limits.

DEEP would appreciate the documentation of the fir clubmoss, including who identified it, photographs or specimens, and the deposition of any specimens, whether they are in university collections or a personal collection. For the newly reported fir clubmoss, a special plant survey form should be completed and submitted. This form can be found at:

http://www.ct.gov/deep/cwp/view.asp?a=2702&q=323460&deepNav_GID=1628

and sent to the DEEP-NDDDB Program email: deep.nddbrequest@ct.gov for proper documentation of a state special concern plant species. Dawn McKay of the DEEP Natural Diversity Data Base program should be contacted with any questions in this regard at (860) 424-3592 or at dawn.mckay@ct.gov

In addition to the State-listed species documented in Chapter 7, several other plant species may occur at the project site and should be surveyed for. Squirrel corn (*Dicentra canadensis*) has historically been reported at Bradley Mountain. This species of special concern likes partial shade in rich hardwood forest, particularly preferring rocky outcrops and deep ravines. It blooms in April-May.

Goldenseal (*Hydrastis canadensis*) is a State-endangered species which has been reported to occur just west of the site. This plant occurs in rich woods, wooded slopes and valleys. It also blooms in April-May.

Tall white bog orchid (*Platanthera dilatada*) is primarily a wetland species, found in wet marshes, fens, bogs and wetlands. It is special concern (historic), being last observed in Connecticut in Plainville in 1900.

Short-stalked false bindweed (*Calystegia sylvatica*) is also a special concern (historic) listing, last observed in Connecticut in Plainville in 1903. Its habitat is meadows, fields and disturbed sites. As discussed in the Report, fields were formerly present on portions of the site, but suitable habitat may no longer be present in the project area.

The dry, sub-acidic forest habitat that runs roughly along the drainage divide between the Quinnipiac and Mattabessett regional basins is a critical habitat type in Connecticut. As such, it is valued more highly than surrounding upland wooded habitats. Dry, sub-acidic forest is characterized by slow growing forest, primarily on or near summits of basalt or other mafic rocks.

No formal contact has taken place between project representatives and the DEEP Natural Diversity Data Base Program. As mentioned, DEEP would appreciate the documentation concerning the occurrence of the fir clubmoss on the site, given that this plant has been considered extirpated in Connecticut.

Sunset Rock State Park and Metacomet Trail

Sunset Rock State Park is an undeveloped State Park owned by DEEP and located west of the project site between Ledge Road and Interstate 84 in Plainville. There are no amenities or

facilities provided at Sunset Rock State Park. No impacts to the park are foreseen arising from the proposed activity should it move forward. Some internet mapping of the project area erroneously labels an area immediately south of the Tilcon quarry as Sunset Rock State Park, which has led to some misunderstanding that the park would be impacted by the excavation of the new reservoir.

A portion of the Metacomet Trail in the western portion of the project site would need to be relocated should the proposal go forward. As the quarrying is proposed to proceed from west to east, the trail relocation would need to occur early in the implementation process for the reservoir. The Connecticut Forest and Park Association (CFPA) manages and maintains the Blue-blazed Trail System, of which the Metacomet Trail is a part. Trail relocation would need to be coordinated with and undertaken by CFPA. Although not explicitly required pursuant to PA 16-61, this report would have benefitted from an analysis of potential recreational impacts and benefits, both during and after the quarrying operations.

General Surface Water Impacts

The proposed quarry expansion would result in significant adverse impacts to surface waters through direct loss from excavation for development of the quarry. The proposed elimination of these surface waters would not be consistent with Connecticut Water Quality Standards. Under the Connecticut Water Quality Standards (§§22a-426-1 through 22a-426-9, inclusive), it is the state's goal to restore or maintain the chemical, physical and biological integrity of surface waters. Surface water includes, among other things, streams, brooks, waterways, wetlands, and other natural or artificial, public or private, vernal or intermittent bodies of water (RCSA §22a-426-1). Where attainable, the level of water quality (i.e., the chemical, physical and biological conditions) that provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water shall be achieved. This standard shall be met, unless a use attainability analysis prepared pursuant to subsections (g) and (j) of 40 CFR 131.10 demonstrates that the surface water has been irreparably altered to the extent that certain designated uses have been permanently lost (RCSA §22a-426-4).

II. Long-term water supply needs for the city of New Britain as well as interconnected, and reasonably feasible interconnected, water companies in the general geographic region surrounding the areas supplied by the city of New Britain's water reservoir system

The WPC believes that any analysis of the need and/or value of any potential new drinking water supply source must consider regional water supplies and demands, but the city's report does not. NBWD should maintain a dialogue with neighboring public water systems, with the Central Corridor and Western Water Utility Committees (WUCCs) being key forums for regional water supply planning discussions.

WUCC Plan

The city's report reaches significantly different conclusions about the New Britain Water Department's long-term water supply and demands than the recently-circulated draft Central Corridor Integrated Report. This 2017/2018 report was developed on behalf of the area's WUCC, which includes the city water department, and the draft is available at http://www.portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/drinking_water/pdf/CentralPreliminaryIntegratedReport_20180315.pdf.

The WUCCs, a collaboration between water utilities and regional planners, worked for two years to develop comprehensive integrated reports to guide future regional water supply planning. Although some of New Britain's report was likely drafted prior to the issuance of the WUCCs' integrated reports, those reports are now published and should be a primary consideration in the analysis of the viability of this concept. The regional supply concept, described in detail in the WUCC Integrated Report should be a part of any analysis of future sources and future supply and demand calculations.

The city's and the WUCC's reports differ significantly regarding margin of safety ratios and other conclusions. One prominent example of the inconsistency between city's finding and those of the WUCC's more thorough regional evaluation is the difference between the 2060 margin of safety (MOS) ratio reported by each. The WUCC report forecasts a minimum MOS ratio of 1.41 in the year 2060, suggesting that the city will likely have a significant surplus of water available at that time. The report provided by the city, on the other hand, forecasts a ratio as low as 0.97, indicating that the water supply would fall short of demands.

Available Water and Margin of Safety

The New Britain Water Department has excess water supply with respect to demand now and through the 50-year planning period, with Table 12-1 of the city's report indicating a current Margin of Safety of 1.94 and a projected Margin of Safety of 1.48 in the year 2060 using the demand projections provided by Lenard Engineering, even without a new reservoir. The Department of Public Health recommendation is to maintain a Margin of Safety of at least 1.15. This information is contained in Section 3E of the DPH-approved 2007 revision to New Britain Water Department's water supply plan. It is unclear why the water supply plan analysis, also conducted by Lenard Engineering, offers significantly different findings than this report.

The city's report does not mention the potential Lamson Corner Reservoir in Burlington. This potential future source is documented in NBWD's approved water supply plan. NBWD has made a significant investment in this source, with the acquisition of a significant amount of land in Burlington. The report should identify if the proposed quarry reservoir will modify NBWD's plans for this future source and why the quarry reservoir concept is preferable.

The city's report's discussions of available water and margin of safety calculations presume a 1 MGD reduction in the purchase of water from the MDC due to the impact of streamflow regulations on the MDC supply. The report, however, did not include the availability of the existing 5 MGD from the MDC's Nepaug Reservoir to the System's total available water. The agreement with the MDC is infinite and the 5 MGD is available to New Britain for as long as it wishes (up to 10 MGD per day is permitted, though the calendar year average may not exceed 5 MGD). The availability of such water from MDC should have been explained in the city's report.

In total, the city's report details an approximate 7 MGD loss of safe yield in the planning report's period, as follows: a 2 MGD reduction due to DEEP minimum streamflow releases, starting in 2027, an additional 1.82 MGD (10 %) reduction in safe yield due to climate change, an additional 1.82 MGD (10 %) reduction due to potential water diversion permit restrictions, and a 1 MGD reduction in available supply from the MDC interconnection. The above noted losses are projections and assumptions, with the report providing no documentation or other basis for them. The city report's analysis postulates all of them occurring, and, therefore, the resultant reductions in water supply and margin of safety are overly conservative and speculative. Again, these compounded loss assumptions are not included in the approved water supply plan produced by Lenard Engineering. It also differs from the analyses done for the WUCC Integrated Report.

Relative to potential reductions in available water supply due to increases in required releases under the 2011 Minimum Stream Flow Regulations, the stated reductions in available water due to these requirements are unsubstantiated and lack a safe daily yield model analysis.

The city's report, on Page 12-1, states that New Britain will have to provide downstream releases to meet DEEP Minimum Streamflow regulations for all surface water sources. However, Shuttle Meadow Reservoir and Wasel Reservoir are expected to be exempt from these regulations, while North and South Hart Pond are expected to be required to make only minimum releases. Detail should be provided on how the 2 MGD reduction in safe yield was estimated. It should also be noted that the Kensington Fire District, Berlin Water Control Commission, and Valley Water Systems have no active reservoirs, so will be unaffected by the release requirements. Finally, Bristol Water Department has 6 surface water reservoirs, 5 of which DEEP expects to be exempt from making streamflow releases.

The demand projections include a number of unsubstantiated, conservative assumptions. For example, page 5-17 states that Valley Water System's Average Day Demand is expected to decrease by 23% by 2060. Valley has not purchased any water from New Britain over the last five years presented in the report, yet the maximum amount in accordance with the purchase agreement is assumed. In addition, a 1 MGD reduction in available supply from the MDC interconnection was added to the supply assumptions without basis. And the report speculates a 10% reduction in supply due to "potential water diversion permit restrictions". All of these assumptions are unsubstantiated reductions in available water supply and appear to be unrealistic.

The projections do not include any expectation for further water conservation and other efficiencies, such as the continuing decrease in average day demand due to normal change-out of plumbing and replacement with low-flow fixtures. In addition, due to energy and wastewater discharge permitting costs, new industrial users are highly motivated to minimize water use, so an increase in 1 MGD from existing and future users is unsubstantiated and appears unrealistic.

The WPC notes that the city's report, on Page 5-4, states that non-revenue water is 19.5%, which is above the recommended 15%. Efforts to reduce non-revenue water to below 15% should be the top priority before considering adding new sources and the report does not make any mention of reduction of this lost water.

III. Likely safe yield increase to the city of New Britain's water reservoir system that could be supplied by such change of use

Although the proposed 2.3 billion gallons of storage would, when the reservoir is in full operation as projected in 40 years, add an expected 2 MGD to the safe yield of New Britain's system, it will for now and until then reduce the system's safe yield by 0.16 MGD due to the quarry operation on the class I and II water company owned land in the Shuttle Meadow watershed area. It is not clear, based on the report's description of this analysis, whether the described supply increase is plausible. The report does not clearly indicate whether or not the water used to fill the quarry reservoir would otherwise be usable in an existing reservoir.

Although not mentioned in the city's report, the nearby Plainville Reservoir was issued an abandonment permit in 1997. The report does not mention this water body or provide an analysis of its potential future reuse for water supply.

IV. Impact on raw reservoir water quality that is likely to occur from such change of use

Perchlorate

The report documents detectable concentrations of perchlorate in the surface water that currently exists at the quarry. The United States Environmental Protection Agency (EPA) has determined that perchlorate is a human health risk and has indicated this contaminant will be regulated in the future (<https://www.epa.gov/dwstandardsregulations/perchlorate-drinking-water>) as part of the Safe Drinking Water Act (SDWA). Testing performed in 2017 did not detect perchlorate, but the minimum detection limit of this monitoring was 80 times higher than the original testing that detected it. Perchlorate is a blasting agent, and is a concern in quarry reservoirs. A nearby example is a quarry reservoir in Rockport, Massachusetts (<https://www.mass.gov/lists/perchlorate-background-information-and-standards>). The city's report does not analyze the potential for an increase in the occurrence of this chemical as a result of expanded quarrying.

Trichloroethylene (TCE)

TCE and 1,2,4-trichlorobenzene were detected in the raw water quality monitoring. TCE is a known human carcinogen and is a drinking water contaminant regulated by CT DPH and EPA under the SDWA. TCE was identified in lab sample #160-22536-A-4 MS at a level that exceeds the proposed maximum contaminant level (http://www.portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/environmental_health/eoha/pdf/032415TCEmcldecember2014apdf.pdf?la=en). The presence of this contaminant does not appear to be referenced or analyzed in the city's report other than in the raw laboratory data. There is a health risk associated with TCE and with 1,2,4-trichlorobenzene, which is also a regulated contaminant (<https://eregulations.ct.gov/eRegsPortal/Browse/RCSA?id=Title%2019|19-13-B|19-13-b102|19-13-b102>). The city's report does identify this contaminant's occurrence and notes "this compound is not anticipated to be an issue." The detection of these chemicals is a concern for the WPC; it is also not known if and how much the use of these chemicals would be increased due to the expanded quarrying operation detailed in the city's report. The report does not appear to analyze the potential for an increase in the occurrence of these chemicals as a result of expanded quarrying.

Stratification

According to the city's report, the proposed reservoir will be susceptible to stratification, which may result in variations in water quality at different depths. Water quality in the completed reservoir is a factor which is not adequately addressed in that report. The depth of the proposed reservoir, up to 130', will result in stratification of the stored water, with a potential for deeper water to develop low dissolved oxygen levels. Such conditions can result in mobilization of metals such as iron and manganese from the walls and floor of the reservoir. Water quality concerns at greater depths might render a considerable part of the reservoir's water unusable.

Manganese

The city's report did not evaluate the potential for manganese to exceed water quality standards in the proposed reservoir. Manganese can be leached from basalt like that proposed to be quarried, with this risk likely increasing due to the expectation for pulverized rock from blasting or from a submerged rubble layer to remain in the completed reservoir. DEEP indicates that manganese has been a problem in discharges from other basalt quarries in Connecticut. Manganese is being studied by the EPA under the UCMR4 for possible future regulation in public drinking water. For private wells, the DPH action level for manganese is currently 500 micrograms/liter.

Reservoir Operation

The city's report proposes that the reservoir would be served by an outlet structure capable of withdrawing water from various depths. The report does not discuss the potential impact if water with low dissolved oxygen is pumped directly to the treatment plant, which is one option mentioned in the report. Contaminants likely to result from water stagnation are typically treatable with the existing treatment process, but can significantly increase the effort and cost of treatment.

Ideally, water would not remain in such a reservoir for an extended period of time and the city's report references this on page 8-7. The desire to use the water of the new reservoir more rapidly to minimize stagnation must be balanced against the high cost of pumping replacement water from Coppermine Brook and the need to provide available capacity in Shuttle Meadow Reservoir to accommodate inflow from the new reservoir.

The city's report only considered the water quality of Coppermine Brook under low or normal streamflow, not during the higher stream flow periods when flood-skimming would occur. Water quality is likely to be significantly different at that time. In particular, the water is likely to have very different levels of organic chemicals, inorganic chemicals, microorganisms including legionella, crypto, giardia, sediments and other organic matters that can get washed into the brook as rain water passes through the streets and the terrain of the Coppermine Brook watershed. This lower quality water will then be pumped to be stored in the proposed quarry reservoir and the subsequent residence period is conducive to the proliferation of a long list of contaminants, such as perchlorate or industrial solvents, that the existing treatment plant may not have the capacity to properly treat.

The WPC notes that drainage from the construction sequence and incremental construction activities would occur in areas that would remain in the watershed draining to the Shuttle Meadow Reservoir. There would be a prolonged (decades-long) risk to reservoir water quality due to these activities in the existing drinking water watershed. There does not appear to be adequate analysis of this in the report.

Much of the area that would be impacted in the proposed expanded area of quarrying is located in the active public drinking water supply watershed of the Shuttle Meadow Reservoir. Surficial activities associated with the quarrying operation, including clear-cutting the forest and removing the stumps, soil and other natural material create a significant water quality risk to the reservoir. The report does not adequately document how this operation will be conducted. There is no information as to whether this process will be done incrementally or immediately, nor what protections will be instituted. It appears that there is a potential for decades of increased risk to Shuttle Meadow Reservoir' water quality.

The city's report mentions that Tighe & Bond analyzed one surface water sample from the existing quarry in 2017 and also reviewed a previous water quality sample that was taken in 2011 as part of a DEEP Permit application. The report finds the quality of these samples to be acceptable as far as meeting drinking water quality standards, but the apparent reliance on two water quality samples is not adequate to fully understand water chemistry. However, it is noted that surface runoff from the site would not constitute a major source of water supply to fill the proposed reservoir due to the very limited watershed area contributing to the reservoir.

The report also does not analyze or discuss the costs of pumping such a large volume of water (2.31 billion gallons) from Coppermine Brook to the site to initially fill the reservoir or the future cost of pumping replacement water. The operational costs could be considerable.

V. Procedures and steps that are available to minimize environmental impacts from such change of use

PA 16-61 required the report commissioned by the city to include an analysis of the procedures and steps that are available to minimize environmental impacts from the proposed change of use of the proposed quarry site. The report, however, does not do this. The WPC has chosen to organize this section around certain DEEP permitting processes likely to be triggered by the proposed change of use and that are intended to minimize environmental impacts of such activities. Some discussion, such as that regarding individual habitats or species of concern, is better suited to the discussion of Sec. I and can be found there.

Three categories of environmental permits are potentially required from DEEP for the proposed action. These are briefly described in Chapter 11 of the Report.

Page 11-2 of the Report cites a need for the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. Because quarries fall under the purview of the General Permit for the Discharge of Stormwater Associated with Industrial Activities, based on SIC code, this latter general permit would be required and would replace the need for a Construction Stormwater Permit. Further, because the New Britain Water Department property is contiguous to the existing Tilcon quarry property and would be quarried by the same operator, the Industrial Stormwater General Permit for the existing Tilcon quarry could be amended to cover the new excavation, even recognizing that the new quarry would be physically separate from the existing one. Though a separate Construction Stormwater General Permit will not be needed for the new excavation, Tilcon would have to comply with the requirements of the Construction Stormwater General Permit program within its Industrial Stormwater General Permit and its operations.

Tilcon should contact the U. S. Army Corps of Engineers concerning the need for a Section 404 Permit in connection with the wetland and watercourse impacts of the proposed action. The Corps may interpret the project impacts to be non-jurisdictional because no fill is being deposited in the wetlands and watercourses, but rather they are being excavated. This would be consistent with some previous jurisdictional rulings by the Corps. If the Corps decides it will not regulate the impacts of the proposed action under Section 404, then a Section 401 Water Quality Certification from DEEP would not be required.

A Water Diversion Permit, pursuant to the Connecticut Water Diversion Policy Act, C.G.S. sec. 22a-365 through 22a-378, may be required for the construction of the reservoir because the elimination of wetlands and watercourses at the proposed reservoir site will alter the instantaneous flow of water at that location. As noted in the Report, the Plainville Inland Wetlands and Watercourses Commission would have jurisdiction over wetlands impacts and mitigation/ compensation at the site, as the proposed action is a private activity, not a state or federal action.

VI. Permits required for such change of use

There are a series of DPH statutory and regulatory reviews that would be required of a proposed new surface water drinking water source. A DPH water company land change in use permit would be required pursuant to CGS Section 25-32. Approval of the new source would be required pursuant to CGS Section 25-33(b). Ancillary facilities would require a regulatory approval pursuant to RCSA Section 19-13-B102(d)(2). Compliance with additional statutes and regulations would need to be established as well, such as Sec. 25-41, *Cemetery not to be within one-half mile of reservoir* and RCSA Section 19-13-B32, *Sanitation of Watersheds*.

In addition to the Water Diversion Permit described in the previous section regarding the elimination of wetlands and watercourses, two additional diversion permits would likely be required due to the proposed reservoir operation. Diversion Permits for consumptive water use would be required both for the flood-skimming operation to fill the proposed storage reservoir with water from Coppermine Brook and, separately, for withdrawals of water from the proposed reservoir once in use.

Conclusion

PA 16-61 and the report it prompted focused on the potential increase in water storage possible by developing a reservoir in the future. The WPC's review followed the requirements of the Public Act. As discussed in the above review, the WPC finds that the city's report does not substantiate the need for the proposed new reservoir or, in fact, that the proposed reservoir would even be a viable public water storage facility. Based on this review, the WPC finds that the proposal's risks to the current public water system and the environment are significant and the city's report does not make a plausible case for undertaking such an activity and, therefore, does not justify the loss of forest and the ecological, recreational and environmental impacts.

The WPC notes that, if a state agency were to consider undertaking a state or federally funded project comparable to this, it could be subject to two processes that require a broad, rigorous review of the project objectives and potential impacts, both direct and indirect. The first is a requirement for state agencies to determine the extent to which a proposed state action is consistent with the state conservation & development policies plan (State C&D Plan), in accordance per Chapter 279 of the CT General Statutes.

If the proposed action was found to be consistent with the State C&D Plan, a state agency undertaking an action of this magnitude would follow the CT Environmental Policy Act (CEPA) review process, per Chapter 439 of the statutes. A key component of the CEPA process is the establishment of a purpose and need statement for the proposed action. Only with a clear understanding of the underlying purpose and need for an action can other agencies and the public help identify potential alternatives for addressing the need and better inform the agency's decision-making process.

Given that the proposed change of use is not an action of a state agency, neither the State C&D Plan consistency nor CEPA review processes apply. The WPC is not suggesting that statutes be amended to make this particular project or other comparable projects be subject to such review, in part because of procedural issues arising when a state agency cannot reasonably be considered the project sponsor. If state or federal funding is sought in the future, however, such as to assist in developing flood-skimming capacity for Coppermine Brook, it would be too late

for a state agency to conduct a meaningful review. By that point, the most significant impacts could be locked in.

The CEPA and State C&D Plan review processes tend to lead to a broader consideration of issues than was done in the city's report. For example, the WPC notes that the report indicates that "the preliminary sequence of quarrying would proceed from west to east for work on the New Britain parcel, to further delay and reduce impacts to residential neighborhoods in New Britain located to the east". State agency reviews of their own projects would ordinarily give much greater consideration to the magnitude and timing of such impacts.

The WPC appreciates the opportunity to review the submitted report and offer the above comments.