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Via Electronic Mail and US Mail

December 4, 2020

Erin O'Hare
Environmental Planner
Inland Wetlands and Watercourses Commission
Wallingford Town Hall
45 South Main Street
Wallingford, CT 06492

Re: IWWC #A20-7.1 / 5 & 21 Toelles Road & Wharton Brook
Pfizer Inc. Soil Remediation Project

Dear Ms. O'Hare,

On behalf of Pfizer Inc. (Pfizer), Woodard & Curran (W&C) is providing this letter in response to Milone & MacBroom, Inc. (MMI) letter dated November 13, 2020 regarding the subject Inland Wetlands and Watercourses Commission (IWWC) permit application. MMI's letter provided a series of comments and this letter provides responses to those comments. MMI's comments are provided below in bold and the responses follow each comment. A new sheet presenting cut/fill analysis has been added to the set of plans and is also provided as an attachment to this letter. An invasive species management plan has also been attached to this letter.

REVIEW COMMENTS

Wetlands and Watercourses

The wetlands and watercourses on site were visually assessed during our site walk. Palustrine forested floodplain wetlands run along either side of Wharton Brook, a perennial watercourse flowing southwest through the project site. There are small patches of palustrine emergent wetlands present within the restoration area. Varying soil conditions were observed within the floodplain wetland. In wetter areas, the soils had a thick organic layer that was intermixed with distinct layers of sand (deposited alluvium) while other areas consisted of fine sandy loam/loamy sands with less distinct sand layers. Overall, a combination of hydric and nonhydric alluvial soils were observed in the floodplain and depressional areas that border Wharton Brook. Further microtopographic features were noted, including hummocks, rills, mounds, berms, channels, and seasonal seeps.

The majority of the wetland area features a largely closed canopy of tall woody vegetation; however, some open areas exist without trees, mostly atop the drier man-made mounds north of Wharton Brook, which features more shrubs and herbaceous plants. The tree strata features trees ranging from approximately 3 to 22 inches diameter at breast height (DBH) and is dominated by American sycamore (Planatus occidentalis), red maple (Acer rubrum), yellow birch (Betula alleghaniensis), shagbark hickory (Carya ovata), and tuliptree (Liriodendron tulipifera), with individual black cherry (Prunus serotina) and northern red oak (Quercus rubra) more typical in the higher elevation alluvial edges. Common shrubs within the site include

spice bush (Lindera benzoin), highbush blueberry (Vaccinium corymbosum), and sweet-pepperbush (Clethra alnifolia). Herbaceous species include bog hemp (Boehmeria cylindrica), blue-flag iris (Iris versicolor), greenbrier (Smilax rotundifolia), crested wood fern (Dryopteris cristata), and soft rush (Juncus effusus). Numerous invasive species were observed on site, including common reed (Phragmites australis), Japanese knotweed (Fallopia japonica), garlic mustard (Alliaria petiolata), reed canary grass (Phalaris arundinaceae), and common wormwood (Artemisia vulgaris), among others and range from several individuals to homogenous stands. The invasive plant species were noted in areas that had low to moderately dense overstory canopy.

This wetland has been disturbed in the past as evidenced by existing man-made fill piles and berms that are scattered sporadically through the wetland. A stormwater outfall with riprap plunge pool is located within the central portion of the wetland restoration area and discharges stormwater into the common-reed-dominated part of the wetland. The existing plunge pool may be undersized for dissipating discharge velocities based on the formation of a gully/channel downstream of the outfall. On the bordering downstream property, an existing brook crossing consisting of twin 60-inch cast iron pipes (CIPs) and concrete headwalls control flooding elevations within the project restoration area. It was noted that one of the 60-inch CIPs was 80 percent clogged with organic debris. The other 60-inch CIP was approximately 10 percent clogged with debris.

It cannot be concluded at this time that all of the existing piles and berms are man-made.

Wetland Restoration

Soils

C1. **The plans and/or project reports are lacking a baseline soil chemistry analysis, including pH, total organic carbon (TOC), and macronutrients (such as available nitrogen and phosphorous) within the project's wetland soils to be excavated. These soil characteristics are extremely important to plant growth and survival. The chemical composition of the topsoil brought on site should reflect ratios of TOC, available macronutrients, and pH that is consistent with the conditions exhibited within the existing soils, which currently support a healthy native floodplain forest. The applicant should provide the targeted soil chemistry requirements for imported topsoil and subsoil for this wetland restoration project. Comments have been raised by the Town regarding the textural class of the existing soils on site versus topsoil and subsoil imports as proposed by the applicant. We recommend that the soil texture for both topsoil and subsoil meet a fine sandy loam to loamy sand textural class. While soil texture is important there are other parameters that are equal or more important for developing a successful restoration project, including maintaining/preserving the existing seasonal hydrologic regime and providing appropriate soils with the necessary chemistry for healthy plant growth. To that end, the proposed grading plan appears to restore the grades (i.e., elevations) to conditions that equal existing site elevations. This grading should promote the preservation of the site's existing hydrologic regime. More information is required to comment on the chemical requirements of the imported topsoil and subsoils for this project.**

The specified organic matter content for organically-enriched topsoil (8-12%) is based on available Site total organic carbon (TOC) data, as discussed in Section 2.2 of Appendix C (Wetland Restoration Plan). The specified organic matter content is consistent with recommendations in Army Corp guidance. Organically-enriched topsoil products typically consist of standard topsoil (sandy loam) blended with compost to enhance the organic content of the material. This typically results in a carbon and nutrient rich medium that is beneficial for seed germination and plant growth.

Additional soil samples were collected on November 24, 2020 to supplement available Site data. Six composite soil samples were collected from the Site wetlands and analyzed for TOC, TKN-nitrogen, nitrate, ammonia, total phosphorous, and potassium. Five composite samples were collected from the surficial organic-rich soils while one composite sample was collected from the underlying sandy soils. These data will be used to inform and adjust backfill specifications, if appropriate and consistent with soil conditions that will promote seed germination and growth of newly planted species.

Prior to construction commencing, the hydrogeologic regime, including micro features (streams, mounds) will be documented in a baseline survey. The three known stream features (seep near wetland flag WF-10 and WF-10; intermittent stream that is south of WF-4 and connected to the unnamed stream on the eastern side of the Site; and intermittent gulley/channel along the eastern side of the two foot excavation area and south of the existing stormwater outfall) to Sheet C-000.

C2. The applicant has provided representative photos of previous forested wetland remediation projects that preserved trees similar to the proposed restoration efforts for this project. We are encouraged by the photos that depict intact trees and dripline root system preservation during remediation practices. This approach will likely provide a level of success for preserving the larger trees within the remediation area.

Acknowledged.

Non-native Invasive Plant Species Management

C3. The non-native plant species management plan does not provide sufficient detail to assess the potential success or effectiveness of the restoration management goals and/or plan. The plan identifies existing and potentially occurring non-native species within the wetland restoration site but does not attempt to quantify in square feet the area of the project or wetlands currently occupied by these invaders. The non-native species management plan states a goal of "less than 20% (relative to native species)" cover of non-native species after the 10-year monitoring period, but it is unclear how that percentage compares to the current percentage of invasive species on site relative to native vegetation. A map depicting the areas of invasive species and quantification of the species coverage should be provided for review.

Figure 1 of the newly prepared Invasive Species Management Plan (see the response to comment C4) presents approximate coverage of two prevalent aggressive invasive species (common reed and Japanese knotweed). Cover of these species is based on mapping completed as part of previous investigations. A cover estimate of these invasive species is provided in the Invasive Species Management Plan. The goal of less than 20% relative cover of invasive species is a reasonable one given the excessive cover of aggressive invasive species throughout the adjacent floodplain and upland areas.

C4. **The non-native species management plan does not sufficiently describe the methods that will be implemented to remove invasive species on site. Specifically, a preconstruction invasive species management plan should be developed prior to finalization of the complete site plan. The preconstruction invasive species treatment plan should address the major areas of invasive species on site to be managed as well as species-specific approaches to be taken during project implementation. For instance, common reed (Phragmites australis) spreads through underground rhizomes that may grow beyond the soil excavation depth. Does the applicant plan to remove rhizomes that occur below this depth in both the 6-inch- and 2-foot-deep excavation zones? Will invasive species management extend into the adjacent wetlands and uplands that border the restoration area? The spread of invasive species from adjacent areas may be problematic once the site is disturbed. Japanese knotweed and common reed are found in immediately abutting areas. Failure to properly address non-native invasive plant species prior to and during construction can greatly impact the success of the restoration project. The applicant should provide a more refined invasive species management plan tailored to this specific site.**

A separate Invasive Species Management Plan has been prepared and is attached. Please note that many details of the plan will be finalized in consultation with the Contractor in advance of the construction work and will be dependent on the season in which the work is ultimately performed.

Planting plan

C5. **The planting plan includes a diverse palette of the native species occurring on site. While many of the shade-tolerant species currently growing on site are represented in this plan, one consideration is whether there will be sufficient numbers of shade-intolerant species planted to survive the first few years postexcavation when significant open canopy will leave many of the new plants exposed. Currently, the site features open patches atop subtle hummocks and other rises where there are only a few large trees. These spots may offer further insight into suitable plants to include in an amended planting list. The applicant is to review the planting plan and provide additional shade-intolerant species for areas that will suffer canopy loss.**

The shade tolerance of the species proposed for planting has been reviewed. The large majority of the proposed species have a wide range of shade tolerance from full sun to partial shade. The species in the planting plan that would be considered strictly shade tolerant include cinnamon fern, sweet woodreed, skunk cabbage, boxelder, and black gum. These species constitute less than 30% of the proposed plantings. The seed mixture contains species with a range of shade and moisture tolerances that would be expected to germinate throughout the site based on the sun, moisture, and soil regimes present in individual microhabitats within the restored area.

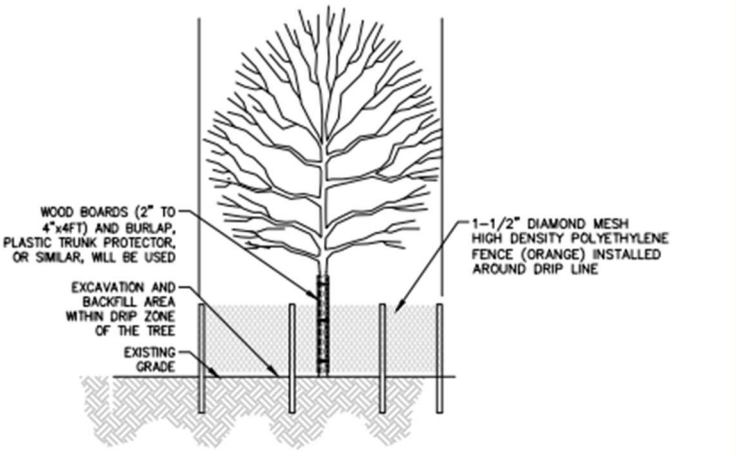
C6. **The applicant should provide tree protection details for those 15-inch DBH trees that will remain within the wetland remediation area. Damage to tree trunks and roots must be minimized to the maximum extent practicable.**

Prior to beginning site construction, the Contractor will be required to submit a tree protection plan for review. The following tree protection notes have been added to Sheet G-001.

Tree Protection Notes

1. Before beginning any site construction, the Contractor shall develop and submit a tree protection plan to the Engineer for review. The plan will include measures as described below, including remedial work to trees, if necessary.
2. In areas where active excavation is to occur in the vicinity of trees to be preserved, the following measures shall be employed.
    a. Temporary safety fence shall be installed around the perimeter of the drip zones of the trees. Fencing shall be resecured during active excavation. The drip zone radius will be determined in consultation with the Engineer.
    b. As shown in the drawing details, a temporary trunk protection device will be installed on the trees to be preserved.
    c. No materials, vehicles or heavy equipment may be stored or stockpiled within areas enclosed by the temporary safety fence.
    d. No vehicles or heavy equipment may be driven, operated, or parked within areas enclosed by the temporary safety fence.
    e. Areas enclosed by the temporary safety fence can not be used as routes for site traffic.
    f. Excavation with heavy equipment is not permissible within the root zones.
    g. Following excavation operations, areas at tree roots shall be backfilled.
    h. As possible, roots shall not be left exposed overnight.
    i. Backfill around tree roots shall be hand compacted in place to fill voids.
    j. Extreme care shall be taken to avoid damage to trunks, branches and roots. Damage caused to trees shallow be immediately remedied by the Contractor. Remedial work may include pruning, wound treatment, cabling, or additional measures as determined by the Engineer. Contractor shall engage a licensed arborist to perform remedial work.

The following tree protection detail has been added to Sheet C-202.



NOTES:

1. NO MATERIAL OR EQUIPMENT SHALL BE STORED OR STOCKPILED WITHIN THE AREA SURROUNDED BY TREE PROTECTION FENCING.
2. FENCE MUST REMAIN AND BE MAINTAINED THROUGHOUT ENTIRE CONSTRUCTION PHASES DURING WHICH CONSTRUCTION MAY AFFECT TREES.

TREE PROTECTION

NOT TO SCALE

C7. The project will preserve an undisturbed swath of riparian vegetation along Wharton Brook, which will help protect the brook during construction and serve as a buffer. It is not clear how the double row of silt fence will impact trees along this riparian zone. Did the applicant survey trees along the proposed silt fence line? If trees are present regardless of DBH they should be preserved and silt fence install modified to protect the tree and its root system.

The silt fence line is at the edge of the excavation area. Trees were surveyed along the edge of the excavation. Trees will be preserved outside of the excavation area. If the silt fence placement needs to be modified slightly to protect the trees, it will be moved.

Monitoring

C8. The monitoring plots proposed (15-foot radius plots established at a density of approximately two plots per acre) are too small to adequately monitor a closed-canopy, topographically heterogeneous community as the one proposed to be restored. We would recommend increasing the number of monitoring plots to four plots per acre.

The number of monitoring plots will be increased to four plots per acre (approx. nine plots for the restored area).

Plan Drawings

Site topography

C9. The plan drawings do not cite the origins of the topographic contours presented on the plan drawings; however, it seems possible that they were derived from remote LiDAR or aerial data rather than ground survey. The applicant should perform a more detailed ground survey prior to finalization of the site plan in order to verify existing elevational gradients and capture the existing microtopography on site (including upland islands, rills, unnamed intermittent watercourse) that were observed during our site visit. This baseline information is important to assess the successful return of site conditions to their previous state. All data sources used in the mapping should be cited on the existing conditions plan.

A Connecticut licensed surveyor interpolated the topographic contours from elevation measurements collected in the field using a total station. On Sheet G-001, General Note 2 has been modified to include the following: Topographic contours were interpolated from elevation measurements collected in the field using a total station.

Prior to the commencement of construction, the hydrogeologic regime, including micro features (rills, streams, mounds) will be documented in a baseline survey.

Hydrology

C10. During the site visit, we reviewed conditions of an off-site brook crossing just west of the project boundary. This crossing consists of twin 60-inch CIPs conveying Wharton Brook west, away from the project site. It was noted that both pipes are significantly obstructed; the river left (facing downstream) culvert had several small dead trees laying in front of the opening while river right culvert was 80 percent clogged with organic debris. The applicant should contact the downstream property owner to coordinate the clearance of these obstructions prior to the commencement of restoration activities in order to reduce potential for backwater flooding of the active construction site upstream.

Prior to construction, Pfizer will contact the property owner to attempt to coordinate clearance of the obstructions.

Erosion and Sediment Control Plan

C11. From our observations during the site walk, it was noted that the proposed cofferdam site was not exceptionally wide and currently hosts riparian trees and vegetation that would in all likelihood need to be removed in order to accommodate the width of even a modestly sized cofferdam as shown in the applicant's project support materials. In our extensive experience with working within and along watercourses, the best means of controlling water is through less invasive cofferdam alternatives than presented to date. We recommend that the applicant review alternatives such as supersac sandbags or some other similarly maneuverable water control that would preserve more of the bank and riparian buffer. The reestablishment of vegetation of this stature along the channel will take a significant amount of time, especially if the removal of existing trees increases the risk of bank or floodplain erosion.

On Sheet G-001, the note regarding flood protection has been modified to include the following: Flood protection measures to be proposed by the contractor need to control water and to minimize tree removal. The use of supersac sandbags or similarly maneuverable water control shall be considered by the Contractor and proposed for review by the Engineer.

The use of supersac sandbags or similarly maneuverable water control will be added to the Contingency Plan Rev. 1, dated November 2020.

National Flood Insurance Program (NFIP) Compliance

C12. The plans appear to propose grading (cut and fill) within a FEMA-regulated floodway. While proposed contours are depicted, no volumetric analysis is provided to ensure that there will be no net fill in the floodway. While the project narrative states the intention to match existing grades, the project plans (from which the project will be constructed) contain no such information. We recommend that a minimum of four cross sections are added to the plan set to depict the intended cut and fills in various locations throughout the floodplain/floodway and that cut/fill volumes be provided.

A new Sheet C-007 has been added to the drawing set and is attached. A total of nine cross sections depicting the existing and proposed grades are shown. As shown by the cross sections, there is minimal change in grades. A cut/fill analysis was performed and there will be a net 3 cubic yard cut across the excavation area. Within the floodway, there is a net 0 cubic yard cut/fill. This cut/fill summary is provided on Sheet C-007.

C13. Any application that proposes grading within any FEMA regulatory floodway of any watercourse must be accompanied by a computational analysis, performed in accordance with standard engineering practice and procedures, and sufficient to certify that there will be 0.00 feet of change to the floodway water surface elevation. This analysis must be accompanied by a signed and sealed no-rise certification from a professional engineer licensed in the State of Connecticut. Please refer to the Town of Wallingford Zoning Regulations, Section 6.5.C-5 for more information.

There are no new encroachments within the floodway. Based on the cut/fill analysis provided on Sheet C-007, there will be no decrease in flood storage capacity within the floodway. In addition, there is minimal change in grades as demonstrated by the cross sections shown on Sheet C-007.

The plan set will be signed and sealed by a professional engineer licensed in the State of Connecticut. The following certification was added to Sheet C-007: Based on the analysis conducted herein, there will be 0.00 feet of change to the water surface elevation within the floodway.

Sincerely,

WOODARD & CURRAN, INC.

Lucas Hellerich

Lucas Hellerich, PhD, PE, LEP
Senior Technical Practice Leader and Engineer

/LH

Enclosure(s)
Sheet C-007
Invasive Species Management Plan

cc: Samantha Somers, Pfizer Inc.
Jack Markey, W&C
Kyle Apigian, W&C

PN: 0232596.00