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April 5, 2019

Ms. Lisa Moore, Manager
Kennett Township
801 Burrows Run Road
Chadds Ford, PA 19317

**Re: Novak Property
Preliminary Subdivision and Land Development Plan**

Dear Ms. Moore:

We are in receipt of the following information for the above noted project:

- Novak Property Preliminary Subdivision Plan Set prepared by Edward B. Walsh & Associates, Inc. dated October 12, 2018, last revised March 15, 2019 (22 Sheets);
- Copy of AECOM's previous review letter, dated January 24, 2019 with notes from Edward B. Walsh & Associates, Inc. in red text, no date, indicating responses to most AECOM comments;
- Stormwater Management Calculations Report prepared by Edward B. Walsh & Associates, Inc. dated March 15, 2019, no revision noted (425 Pages);
- Erosion and Sedimentation Pollution Control Report prepared by Edward B. Walsh & Associates, Inc. dated March 15, 2019, no revision noted (19 pages);
- PNDI Search (PNDI Search ID: PNDI-654370), dated April 6, 2018 (6 pages); and
- Response memorandum in response to TCA Landscape Consultants' review letter, dated January 25, 2019, prepared by Edward B. Walsh & Associates, Inc., dated March 18, 2019 (2 pages).

The Plan proposes to subdivide existing UPI # 62-4-308.1, located in the R-1 – Residential Zoning District and containing 42.446 acres, into 4 lots (Lot 5 (4.148 acres), Lot 6 (4.586 acres), Lot 7 (4.816 acres) and Lot 8 (8.023 acres) along with an existing conservation easement (21.562 acres - per Deed Book 6290 Page 1931). The development of each lot will consist of a single-family dwelling as well as associated utilities and stormwater management. The lots will be serviced through on-lot wells and septic systems. Lot 6 contains an existing 2 ½ story dwelling that is proposed to remain. The existing septic system for this lot is located almost fully on Lot 5. A septic access easement is proposed for this existing facility.

The project parcel, UPI #62-4-308.1, is located at the end of Sunstone Lane. The driveway for Lot 8 will access the cul-de-sac of Sunstone Lane. Lots 5, 6 & 7 will access Norway Road (T-627) via a proposed private driveway right-of-way. The proposed private drive will access the west side of Norway Road at the intersection with Carlton Drive.

In addition, the plan proposes minor modifications to existing UPI #s 62-4-307.2 (Lot 2) and 62-4-307.3 (Lot 3). These lots are part of the previously approved Final Major Subdivision Plans for Mr. & Mrs. Craig Novak (for UPI # 62-4-307) prepared by Advanced Geoservices of West Chester, PA, dated August 3, 2011, last revised November 5, 2012. The approved Plan was recorded at the Chester County Recorder of Deeds as Plan #19420 on June 28, 2013. The proposed modifications include shifting the previously proposed dwelling, driveway and septic locations on Lots 2 & 3. Lot 2 is to change from 4.664 acres to 4.132 acres and Lot 3 is to change from 7.364 acres to 5.714

acres to provide a 50' wide proposed private driveway right-of-way to allow for Lots 5, 6 & 7 to access Norway Road (T-627).

AECOM has reviewed this submission as a Preliminary Subdivision and Land Development Plan in accordance with the Kennett Township Zoning, Subdivision and Land Development and Stormwater Management Ordinances. **All prior comments which were not indicated to be resolved in our January 24, 2019 letter are listed below with the dates of our prior review letters inserted parenthetically after each. New or modified comments are indicated by bold italic text.**

Subdivision and Land Development Ordinance

1. §206-403.D requires a Natural and Cultural Resources Site Analysis Plan. The current submission includes this plan. The following comments regarding this plan should be addressed:
 - A. §206-403.D.(2) requires floodplains, watercourses, wetlands and any historic resources to be shown on the plan. Notes regarding the presence or source of these items should be included on the plan. In addition, any watercourses should be labeled. (11/21/18) The required items have now been added to the plan. Notes regarding the sources for these items (floodplains, wetlands and historic resources) should be included on the plan sheet. This item remains unresolved. (1/24/19) **The Applicant states that notes regarding the sources for these items have been provided on other plan sheets. The source notes should be provided on Sheet 5 – Natural and Cultural Resources Site Analysis Plan.**
 - B. §206-403.D.(2).(j).[4] requires the locations of all specimen vegetation, including heritage trees, to be identified based upon field investigation, and within affected areas only. The location of all individual trees 12" diameter breast height shall be indicated. A survey of the individual trees has not been provided. (11/21/18) A tree survey has been performed to determine the location of all trees on the project site. Note 9 on the Existing Conditions Plan (Sheet 3) indicates that the survey was performed by Edward B. Walsh & Associates. The date of the survey should be included in this note. This item remains unresolved. (1/24/19) **The date of survey has been added to the plan. This item has been resolved.**
2. §206-403.G(2) requires submission of a Sewage Facilities Planning Module. The Applicant has provided a copy of a Planning Module package, but test pit and percolation test information as required by §206-403.G(2)(a) have not been provided. Please see additional Planning Module comments elsewhere in this letter. (11/21/18) Test Pit and percolation test information has been inserted in the current Planning Module submission, although no revision date is noted. Please see additional Planning Module comments elsewhere in this letter. (1/24/19) **No additional information has been provided with this submission. Comment remains.**
3. §206-508.E requires location of both primary and replacement sewage disposal areas for on-lot sewage systems, provision of soils testing in support of same, and a prohibition on any construction activities, construction equipment, earthmoving activity, earthmoving equipment, or paving within the designated primary and replacement disposal areas. The noted prohibition on disturbance is to be memorialized on the plan as a deed restriction. Required test pit and percolation test information should be provided, and both primary and replacement disposal areas delineated on each proposed lot and each lot with revised lot lines in accordance with the testing results and applicable DEP regulations. (11/21/18) The location of primary and

replacement sewage disposal areas for the on-lot sewage systems have now been provided on the Site Layout, Grading and Construction Improvement Plan (Sheets 9 & 10), including the location of the soils testing performed. Much of the soils testing is over 7 years old; the Applicant should provide written acceptance of this aged testing by the Chester County Health Department. All percolation test reports should also indicate which area was tested (e.g. associated test pits). Additional comments regarding sewage disposal area layouts will be provided upon receipt of a submission that addresses these items. We also note that no information regarding a deed restriction for these areas has been included on the plan. (1/24/19) **No information has been provided with this submission. The Applicant states that deed restrictions will be provided at Final Plan. We have no objection to addressing these requirements at Final Plan submission.**

4. §206-517.A provides the requirements regarding limitations to woodland disturbance. No specimen vegetation, including heritage trees, shall be removed from any lot except where the applicant demonstrates to the satisfaction of the Board of Supervisors that such removal is essential to eliminate hazardous conditions or otherwise permit lawful use of the lot or tract. Specimen trees to be retained shall be credited toward any tree replacement required under §206-517.B. §240-201 defines specimen vegetation as:
 - A. Any individual plant or group of plants identified on the Visually Significant Resources Map (2002) of the Kennett Township Resources Analysis, or which are located in a rare, threatened, endangered (RTE) species site;
 - B. A "heritage tree" as defined in [the Zoning Ordinance]; or
 - C. Any tree or other vegetation determined to be of specimen quality as determined by a registered landscape architect or which generally falls within the parameters of those trees listed in Appendix B, Heritage Trees.

Individual trees have not be surveyed or indicated on the plan. Note 9 on the Overall Existing Conditions Plan (Sheet 2) states that the woodlands illustrated are extracted from Pro-Maps Survey. Per the "Kennett Township Woodland Classification and Forest Interior Map" (2005) provided in Appendix E of the Zoning Ordinance, the site contains Class I, II and III woodlands as well as Interior Forest Habitat (within the Conservation Easement Area). The areas of woodlands outside of the riparian buffers should be indicated on the Protected Resource Table on the Overall Existing Conditions Plan (Sheet 2) with any applicable areas of disturbance.

§206.517.A.(4) states that any woodland disturbance exceeding any of the standards listed in this section shall require woodland replacement. The Applicant should demonstrate compliance with this Section with regard to any tree replacement requirements. (11/21/18) A tree survey has now been performed. There are several trees ranging in diameter from 12" to 24" proposed to be removed as indicated on the Existing Conditions Plan (Sheets 2 & 3). The Applicant should demonstrate how the woodland replacement requirements will be met. The Township's Landscape Architect, Thomas Comitta & Associates should review the proposed tree removal and woodland replacement for acceptability. (1/24/19) **The Township's Landscape Architect, Thomas Comitta & Associates states in their March 25, 2019 review letter that the Woodland Management Plan includes the essential elements required for this plan. The letter refers the plan to the Environmental Advisory Council (EAC) for further comments. The EAC should review for acceptability.**

Zoning Ordinance

1. §240-1802.C states the wetlands standards. There are multiple areas of wetlands in the proposed project area. §240-1802.C.(1).(a) requires any project that proposed any regrading or placement of fill in wetlands shall provide proof to the Township that the PA DEP (Bureau of Dams and Waterway Safety and Bureau of Water Quality Management) and the United States Army Corps of Engineers have been contacted to determine the applicability of state and federal wetland regulations. A copy of any correspondence or required permits should be provided to the Township. (11/21/18) No response has been provided with this submission. This comment remains unresolved. (1/24/19) ***The Applicant states that this information will be provided. This comment remains unresolved.***
2. §240-1802.C.(2) requires a full wetland delineation report. A copy of the wetland delineation report should be provided to the Township. (11/21/18) The Applicant states that this will be provided. This comment remains unresolved. (1/24/18) ***The Applicant states that this will be provided with Final Plan. We recommend that this be submitted prior to Preliminary Plan approval.***
3. §240-1802.E provides the watercourse and riparian buffer standards. Per §240-200, the Zone One: Inner Riparian Buffer shall consist of a minimum width of 35 feet from the edge of bank, and must be increased to include any steep slopes up to a maximum of 100 feet on either side of the watercourse. The Zone Two: Outer Riparian Buffer includes the remainder of the 100 foot buffer along either side of the watercourse. The width of the buffer zones should be indicated on the plan either through a label or a note. In addition, no disturbance within the Zone One Riparian Buffer is permitted unless it is permitted by the Commonwealth. Any applicable permits should be provided to the Township for the proposed disturbances. (11/21/18) The riparian buffer zones have been labeled on the plans. Disturbance within the Zone One Riparian Buffer is proposed. The Applicant indicates that a GP-7 permit will be obtained. This approval requirement should be noted on the Cover Sheet. In addition, a copy of the required permit should be provided prior to Final Plan approval. This item remains unresolved. (1/24/19) ***The required permit has been listed on the Cover Sheet. The Applicant states that the permit will be provided prior to Final Plan approval. We have no objection to provision of the permit at Final Plan submission.***
4. §240-2021 provides the standards for interior lots. §240-2021.B allows up to three interior lots to share a common driveway. Three lots are proposed to use the proposed common driveway. §240-2021.F requires cross-easements and maintenance agreements for use and maintenance of the common driveway to be submitted to the Township for review and approval. Such easements and maintenance agreements are to be recorded with the approved final subdivision plan and each interior lot deed. All such documents should be reviewed and approved by the Township Solicitor prior to Final Plan approval. (11/21/18) Copies of the proposed easements should be provided prior to Final Plan approval. This item remains unresolved. (1/24/19) ***The Applicant states that the required easements will be provided at Final Plan. We have no objection to deferring the proposed easement documents until Final Plan submission.***

Stormwater Management Ordinance

The stormwater management design has been redesigned since the last submission to include rain gardens, managed release BMPs and wet ponds. In addition, new soil testing

was performed in March 2019 with the results provided in the Post Construction Stormwater Management Report (starting on page 387). The following requirements regarding the proposed stormwater management design still need to be addressed:

1. §199-303.A.(1)(a) requires a letter of adequacy or other approval from PADEP in compliance with Title 25, Chapter 102, of the Pennsylvania Code of an erosion and sediment control plan for construction activities. The Erosion and Sediment Control Plan should be kept on-site throughout the duration of the regulated activity. This should be noted on the Plan. In addition, §199-303.A.(1)(b) requires a PADEP NPDES construction activities permit. This permit should be provided prior to final approval. (11/21/18) The required note has been provided on the Erosion and Sedimentation Pollution Control Plan. A letter of adequacy and the PADEP NPDES construction activities permit should be provided prior to final approval. This item remains unresolved. (1/24/19) **The Applicant states that these requirements will be addressed at Final Plan. We have no objection to addressing these requirements at Final Plan application.**
- 1A. The Post Construction Stormwater Management (PCSM) Plan (Sheets 13 & 14) now proposes the use of 8 rain gardens to provide water quality and runoff volume control. A detail titled Detention/Infiltration Basin Cross Section has been provided on the PCSM Detail Sheet (Sheet 17). The proposed rain garden design must follow the requirements outlined in Chapter 6 of the PA DEP BMP Stormwater Manual (BMP 6.4.5: Rain Garden/Bioretenion). The following comments regarding the proposed rain gardens should be addressed: (1/24/19)

The stormwater management design has been redesigned for all of the lots since the previous submission and now proposes the use of 2 rain gardens, 3 Managed Release Concept (MRC) stormwater BMPs and 2 wet ponds. New details for the Managed Release Concept stormwater BMPs and wet ponds have been added to the PCSM Detail Sheet (Sheet 17). The following comments regarding the revised stormwater management design should be addressed:

- A. The Detention/Infiltration Basin Cross Section detail name on the PCSM Detail Sheet should be updated to match the labels on the PCSM Plan (i.e., Rain Garden). (1/24/19) **The detail and proposed facility labels have been updated. This item has been resolved.**
- B. §199-311.A provides the requirements for stormwater management facilities, including ponds/basins. Per §199-311.A.(1).(c), exterior and interior slopes shall not exceed 4:1 slopes. §199-311.A.(1).(d) requires a minimum 10 foot top of berm width and all outlet pipes to have a minimum diameter of 15 inches. All pipe materials shall be reinforced concrete pipe unless otherwise approved by the Township. The details should be updated to reflect these requirements.
- C. §199-311.A.(1).(e) states the requirements for outlet structures. The outlet structure type should be specified in each detail on Sheet 17. The trash racks should be epoxy-coated galvanized or stainless steel.
- D. **Rain Garden Design** - The Design Considerations for rain gardens are provided on Page 57 of Chapter 6 of the PA DEP Stormwater BMP Manual. The following items should be addressed: (1/24/19)

- i. Sizing Criteria 1c states that the surface ponding depth should not exceed 6 inches. The detail indicates a top of riser elevation but no detail or information has been provided for a riser. In addition, proposed ponding depths for the rain gardens range from 0.67' to 1.25' in depth. The detail should provide information on the proposed riser and the ponding depths should be updated to meet the requirements of the PA DEP BMP Manual. (1/24/19) ***The ponding depths for the proposed rain gardens have been reduced. This item has been resolved.***

- ii. Sizing Criteria 1e states that the planting soil depth should generally be at least 18" where only herbaceous plant species will be utilized. The detail does not indicate the planting soil depth. The cross section view indicates that the depth "varies". The proposed inverts of the 6" perforated underdrains for the rain gardens range from 0.67' to 2' below the proposed bottom of ponding area elevation. The detail/design should be updated to include a minimum of at least 18" of planting soil. (1/24/19) ***The planting soil depth has been increased. This item has been resolved.***

- iii. ***The rain gardens have been redesigned since the previous plan submission and the detail on Sheet 17 has been revised. The following items should be addressed:***
 - a. ***The table in the detail lists the limiting zone elevation for the two rain gardens. The limiting zone elevations do not match the results of the testing. The limiting zone for Rain Garden #3 should be ~278.5' (Test Pit at elevation ~286 – 90 inches = 278.5) and the limiting zone for Rain Garden #6 should be ~289' (Test Pit elevation at ~296 – 84 inches). The proposed elevation of the bottom of soil for each of the facilities does not provide the minimum 2 foot separation distance between the bottom bed elevation and the top of the limiting zone. This should be corrected.***
 - b. ***Test Pit #s 3-12-8 & 3-12-9 were performed near the footprint of Rain Garden #3. The infiltration tests indicate that the infiltration tests were performed at 5.5' and 3.5' below existing grade. The existing grade for these test pits are approximately elevation 286. Therefore, the testing was performed around elevation 280.5 and 282.5, respectively. The bottom elevation of Rain Garden #3 is 278.5. The infiltration testing was performed above the bottom bed elevation. Infiltration testing should be performed at the bottom elevation of the proposed facility. Additionally, the narrative indicates that the infiltration tests yielded an average infiltration rate of 1.06 in/hr (not including the required factor of safety of 2.0). The stormwater calculations assume an infiltration rate of 1.5 in/hr. The calculations should be corrected to use the required factor of safety.***
 - c. ***Test Pit # 9-25-5 from the previous submission was used for the design of Rain Garden #6. The infiltration log for TP #5 in the September 2018 soil report indicates that the infiltration test indicated a k value of 0.926 in/hr at 3 feet below existing grade. The existing elevation in this area is ~296 (indicating the testing to be at ~293). The proposed bottom bed elevation is 289.5. The infiltration testing should be performed at the bottom elevation of the proposed facility. Additionally, the calculations assume an infiltration rate of 1.0 in/hr. The infiltration rate should be reduced to account for the required factor of safety (2.0).***

- d. The predevelopment conditions input data/hydrographs for Lot #3 has not been included in the calculations.*
 - e. For Rain Garden #3, the 278.50 listed in the table in the detail for the Top of System Elevation should be clarified.*
 - f. Sizing Criteria 1a on Page 57 of Chapter 6 of the PA DEP Stormwater BMP Manual requires a maximum loading ratio of 5:1 (impervious drainage area to infiltration area) for the design of rain gardens. The impervious drainage area for Rain Garden #6 exceeds the maximum ratio (6.14:1).*
 - g. The invert elevation for the outfall pipe and the top of riser elevation provided in the table in the detail for Rain Garden #6 on Sheet 17 Rain Garden #6 do not match the calculations.*
- E. Managed Release Concept BMP Design - The Managed Release Concept BMPs were designed in accordance with the PA DEP White Paper, entitled "Managed Release Concept", dated December 13, 2018 ("White Paper"). The following comments regarding the design of these facilities should be addressed:**
 - i. Per the detail on Sheet 17, a 6" perforated underdrain is proposed within the bottom of each Managed Release BMP. The perforated underdrain is to be connected to the outlet structures via an elevated elbow. The table indicates an orifice at this connection of 0.6" to 0.67". The Applicant should clarify how the orifice at the connection is larger than the proposed underdrain. Additionally, a portion of the elevated elbow will be above ground or have very little cover. The Applicant should clarify this.*
- F. Wet Pond Design – The design is required to be in accordance with §199-311 as well as the Design Considerations for wet ponds provided on Page 163 of Chapter 6 of the PA DEP Stormwater BMP Manual. The proposed design now includes two wet ponds (Wet Pond #1 to control runoff from the access drive and Wet Pond #8 to control runoff from Lot #8). It is AECOM's understanding that these wet ponds may be used as a water supply for fire protection purposes. The following items should be addressed:**
 - i. §199-311.A.(1).(d).[6] requires retention basins to be designed to create a healthy ecological community with sufficient circulation of water to prevent growth of unwanted vegetation and mosquitos. The retention basin shall be of sufficient size to allow the appropriate aquatic community needed to maintain healthy pond ecology and avoid mosquitos capable of carrying West Nile Virus and other diseases. Per §199-310.A, any BMP intended to hold standing water for four days or longer shall be designed to incorporate biologic controls consistent with the West Nile Guidance found in Appendix C, PADEP document 363-0300-001, "Design Criteria – Wetlands Replacement/Monitoring" (as amended). Additionally, per Design Consideration 5 on Page 166 of the PA DEP BMP Manual, vegetation is an integral part of a wet pond system. The Landscape Plan does not indicate any proposed plantings or vegetation within the proposed wet ponds. Note 10 of the Wet Pond/Detention Basin detail on sheet 10, requires that all required maintenance and monitoring guidelines are followed. No information has been provided regarding these requirements. The referenced document, PA DEP Document 363-0300-001, provides specific monitoring and maintenance*

requirements for the proposed plantings. A specific maintenance and monitoring program should be noted on the plan for the proposed wet ponds.

- ii. §199-311.A.(1).(d).[7] requires wet ponds to include a suitable valve and outlet to drain the permanent pool area. This should be included in the detail on Sheet 17.**
- iii. §199-311.A.(1).(d).[8] requires wet ponds to have a ten-foot wide level safety bench one foot below the permanent pool elevation.**
- iv. Per Design Consideration 1 on Page 166 of the PA DEP Stormwater BMP Manual, an adequate drainage area (a minimum of 5 acres) or proof of sustaining constant inflow should be provided to ensure long-term viability and to reduce stress on vegetation in and adjacent to the pond. The drainage areas to Wet Ponds #1 and #8 are 0.67 acres and 2.88 acres, respectively. The testing performed in September 2018 (provided with the previous submission) was used to determine the permanent water surface elevation.**

For Wet Pond #1, Test Pit #9-25-3 indicates redox features at 12" (Elev. ~283) (indicative of the seasonal high water level) and seeps at 36" (Elev. ~281). The proposed permanent water surface elevation is 283 with the bottom basin elevation at 280. Given the small drainage area and the testing results, it is unclear if the permanent water surface elevation will be maintained at Elev. 283. We recommend that the design be revised in accordance with the test pit findings.

For Wet Pond # 8, Test Pit #9-25-4 indicates redox features at 10" (Elev. ~281.67) (indicative of the seasonal high water level), seeps at 18" (Elev. ~281) and groundwater at 36" (Elev. ~279.5). This test pit was performed approximately 100' away from the proposed wet pond. The proposed permanent water surface elevation is 276.5 with the bottom basin elevation at 273.5. Give the small drainage area and the distance of the test pit, it is unclear if the permanent water surface elevation will be maintained at 276.5. A test pit at the wet pond location should be evaluated to verify.

- v. The design calculations for the wet ponds model the volume within the permanent pool as available storage. The available storage should begin at the proposed permanent pool elevation.**
- vi. The Wet Pond/Detention Basin Detail on Sheet 17 – PCSM Detail Sheet provides the detail for the proposed wet ponds. There are several discrepancies in the detail in relation to the provided calculations. The following items should be addressed:**
 - a. The spillway dimensions noted in the detail on Sheet 17 indicate an emergency spillway 140 feet in length and 0.25 feet in height for both wet ponds. The calculations model a 10' wide emergency spillway for Wet Pond #1 and a 15' wide emergency spillway for Wet Pond #8. This should be corrected to match the calculations and plan view.**
 - b. The section view of the wet pond in the detail includes two arrows labeled '2.5" orifices (may be closed or open)'. The table in the detail indicates one**

2.5" orifice for the outlet structure for each wet pond. However, the calculation for Wet Pond #1 does not include an orifice and the calculations for Wet Pond #2 model a 6" orifice at elevation 276.00. This should be clarified.

- c. The section view of the wet pond shows the outlet pipe connecting to a proposed Type M inlet with a proposed 18" RCP pipe connection to an existing 36" ADS pipe. This does not match the plan view, which shows the outlet pipe outfalling to a riprap apron. Additionally, the outfall elevation provided in Column G does not match the locations of the proposed outfalls in the plan view on Sheet 13 – Post Construction Stormwater Management Plan.**
2. §199-305.A requires the post-construction total runoff volume to not exceed the predevelopment total runoff volume for all storms equal to or less than the 5-year 24 hour , precipitation. The post development grass cover should be modeled as Type C soil (instead of Type B) in accordance with the requirements of §199-309.D.(3).(e) which requires all disturbed areas returned to pervious area to be reduced by one hydrologic soil group level for post-development runoff calculations. Runoff volume calculations have been provided in Appendix A of the Stormwater Calculations Report on page 25 (Access drive), page 65 (Lot 2), page 105 (Lot 3), page 145 (Lot 5), page 185 (Lot 7), page 226 (Lot 8, POI #1) and page 252 (Lot 8, POI #2). The calculations should be updated to reflect the above requirements. The provided runoff volume calculations provided only include the 2 year storm event runoff volume and do not model the disturbed pervious area as being reduced by one hydrologic soil group. Additionally, a calculation/summary table should be provided indicating how the post development total runoff volume will be reduced to the pre development volumes. (11/21/18) The runoff volume calculations have been revised to model disturbed grass cover as Type C soils in accordance with the requirements of §199-309.D.(3).(e); however, the volume calculations only include the 2-year 24 hour precipitation volumes. The calculations should be updated to include the 5-year 24 hour precipitation volumes. Additionally, a summary table indicating the required volume reduction needed and the proposed storage volume calculations has not been provided. This should be included in the calculation narrative. (1/24/19)

Additionally, although the runoff volume calculations have been revised to model the post development grass cover as Type C soil (instead of Type B) in accordance with the requirements of §199-309.D.(3).(e), the peak flow calculations have not been updated to reflect this requirement. These items remain unresolved. (1/24/19)

§199-305.A requires the post construction total runoff volume to not exceed the pre development total runoff volume for the 5 year storm event. Per §199-305.B, the Township's Board of Supervisors upon recommendation from the Township Engineer shall permit modifications to the runoff volume requirements of the Ordinance. In no case shall the post-construction total runoff volume exceed the predevelopment total runoff volume for the two-year, 24 hour design storm. The Applicant has provided evidence that infiltration is not feasible for the majority of the site. Where infiltration has been found feasible, the Applicant has proposed two rain gardens, Rain Garden #3 (on Lot# 3) and Rain Garden #6 (on Lot# 8). Where infiltration has been found to be feasible, the post-construction runoff volume for the 5-year 24 hour storm event shall not exceed predevelopment conditions. Where infiltration has been proven not to be feasible, the Applicant has proposed Managed Release Concept BMPs and wet ponds. At a minimum, the post-construction runoff volume for the 2-year 24 hour storm event

should not be exceeded for these drainage areas. While the calculations in the PCSM report include the required volume to be addressed for each drainage area, no calculations have been provided for how the wet ponds and rain gardens meet these requirements. A summary table of how these requirements have been met should be provided in the Post Construction Stormwater Management Report. This comment remains unresolved.

3. §199-306.A states that where possible, infiltration should be designed to accommodate the entire water quality and runoff volume required in §199-305. The Applicant is proposing the use of rain gardens (previously labeled detention/infiltration basins) with 6-8" perforated underdrains. Design Consideration 15 on Page 30 of Chapter 6 of the PA BMP Manual allows for the use of a backup underdrain to be considered in the event that the water in the basin does not drain within the required time period. The proposed underdrains should either be removed from the design or a valve should be provided. If an underdrain valve should be provided, it should remain in the shut position unless the basin does not drain. (11/21/18) The Soils Report for Stormwater Recharge Suitability states that the soils are generally not suitable for infiltration and that 4 of the 5 test pits encountered limiting zones (i.e. redoximorphic features and groundwater). Per §199-305.A, the post-construction total runoff volume shall not exceed the predevelopment total runoff volume for all storms equal to or less than the 5-year, 24-hour duration precipitation. This volume shall be captured and permanently retained or infiltrated on the site. Permanent retention options may include, but are not limited to, reuse, evaporation, transpiration and infiltration. Infiltration shall be the preferred method of volume control, and evaporation and transpiration may only be used to achieve volume control if the applicant demonstrates with calculations and data to the satisfaction of the Township Engineer that infiltration on the site is not physically possible. The proposed rain gardens with underdrains do not provide the required volume reduction. The Applicant should demonstrate how the requirements of this section will be met. This item remains unresolved. (1/24/19) **The rain garden detail on Sheet 17 still includes the 6" perforated underdrain pipes; however, these pipes were not modeled in the stormwater calculations. The use of these underdrains would greatly increase the peak flow for each storm event. The underdrains should be removed from the detail or a gate valve that is to remain closed should be included. This comment remains unresolved.**
4. §199-306.E requires soils evaluations for the proposed infiltration BMP. No test pit or infiltration testing data has been provided. Infiltration testing and test pits should be provided in accordance with the Kennett Township Stormwater Management Ordinance as well as the PA DEP Stormwater BMP Manual. The location of the infiltration testing/test pit should be provided on the Plan once they are performed. §199-306.E.(2).(a) requires one infiltration test for each facility with a surface area of less than 1,000 square feet. Two infiltration tests are required for surface areas between 1,000 and 2,000 square feet. If the facility area exceeds, 2,000 square feet in surface area additional testing is required as noted in this section. Additionally, §199-306.F.(1) requires a minimum depth of 24 inches between the bottom of the BMP and the top of the limiting zone. The test pits should extend a minimum of 24 inches below the depth of the deepest cut area for each facility. (11/21/18) Test pit and infiltration testing results have now been provided for the rain gardens proposed on Lots 5 through 8 only. No testing results were included for the rain gardens proposed within the lots contained in the previously approved set (i.e., Rain Garden #2 on Lot 2 and Rain Garden #3 on Lot 3). Per §199-306.E.(2).(a), two (2) infiltration tests are required for each of the proposed facilities (since they range in size from 1,076 square feet to 5,860 square feet). (1/24/19)

One test pit was performed for each of the proposed rain gardens on Lots 5 through 8. The Soils Report for Stormwater Recharge Suitability states that the soils are generally not suitable for infiltration and that 4 of the 5 test pits encountered limiting zones (i.e. redoximorphic features and groundwater). Therefore, only one test pit was performed for each facility and infiltration testing was only performed at TP# 5 on Lot 8. According to the testing, the required separation distance has not been provided for Rain Garden #s 1, 5, 7 & 8, with the proposed underdrain elevations located completely below the elevation where redoximorphic features were encountered (i.e., within the seasonal high water level). Only Rain Garden #6 includes the required separation distance. (1/24/19)

No testing was provided for Rain Garden #2 on Lot 3 and Rain Garden #3 on Lot 3. The design of these facilities has changed since the previously approved plan. A minimum of two infiltration tests and a test pit are required for each of these facilities. (1/24/19)

It appears the soils within Lots 5 through 8 are not suitable for infiltration. No further infiltration testing is needed within these areas. See Comment 3 above for additional information on the design of the rain gardens. No testing has been provided for the rain gardens proposed on Lots 2 and 3. This information should be provided. This comment remains unresolved. (1/24/19)

Additional soils testing has been performed since the previous plan submission. The new testing results report has been included in the Post Construction Stormwater Management Report starting on Page 387. The stormwater management design has been completely revised since the previous plan submission. The soil testing results from the new testing as well as from the previous submission were used for the current design. All of the soil testing results should be included in the current Post Construction Stormwater Management report for future reference.

The testing for the Managed Release BMPs appears to be adequate. Comments regarding the adequacy of the testing for the rain gardens and wet ponds have been provided above in the comments on the design of these facilities.

5. §199-306.F.(3) requires infiltration facilities to completely drain the infiltration volume within two days (48 hours) from the end of the design storm. Calculations should be provided to ensure that the proposed facilities drain within the required time period. (11/21/18) The current stormwater design meets the requirements of this section; however, any revisions to the stormwater management design per the comments of this section should continue to meet the requirements of §199-306.F.(3). This item is presently resolved. (1/24/19) ***The infiltration testing comments for the rain garden designs should be addressed to ensure that the proposed rain gardens will completely drain within 48 hours from the end of the design storm. This comment remains.***

6. §199-306.I requires all infiltration practice components to be protected from compaction due to heavy equipment operation or storage of fill or construction material during construction. Infiltration areas shall also be protected from sedimentation and stormwater runoff during construction by diversion berms or other features necessary to protect the facility. Areas of infiltration practices that are accidentally compacted or graded shall be remediated to restore soil composition and porosity, and the Township may require the size of the infiltration facility to be expanded to compensate for the unintended compaction. Adequate documentation of the remediation effort shall be submitted to the Township Engineer for review and comment. These

requirements should be reflected in the Sequence of Construction as well as in the Plan view. Silt fencing and orange construction fence (OCF) should be shown on the Plan around the proposed infiltration facilities. A diversion berm may be needed to avoid directing potential sedimentation from the construction area. In addition, the topsoil stockpile location should be provided to ensure that runoff from the stockpile area is not directed towards the proposed infiltration facility. (11/21/18) The remediation requirements noted in this comment should be included in the Sequence of Construction on the E&S Detail Sheet (Sheet 18). In addition, the Erosion and Sedimentation Pollution Control Plan (Sheets 15 & 16) only indicate orange construction fence (OCF) around the proposed infiltration facilities. The facilities should be protected from sedimentation during construction through silt fencing or compost socks. This item remains unresolved. (1/24/19) **Notes regarding the requirements of §199-306.I still have not been provided on the Plan. In addition, the OCE and silt sock proposed around the proposed infiltration facilities is indicated by a solid bold line. These areas should be labeled on the plan or the linetype should be updated to include OCF/SS to ensure that this requirement is noted by the contractor.**

7. §199-402 states the SWM site plan content requirements. The following items should be included on the Post Construction Stormwater Management Plan (Sheets 12 & 13) (now Sheets 13 & 14). In addition, the approved Stormwater Site Plan should be kept on-site throughout the duration of the regulated activity in accordance with §199-301.A. This should be noted on the Plan. (11/21/18) A note requiring the approved Stormwater Site Plan to be kept on-site has not been provided on the plan. This item remains unresolved. (1/24/19) **The required note has now been provided. This item has been resolved.**
 - A. §199-402.A.(2) requires a listing of all regulatory approvals required for the proposed project. Final approval letters must be submitted to the municipality prior to or as a condition of final approval of the SWM plan. (11/21/18) A list of the required approvals has not been provided on the PCSM Plan (Sheets 13 & 14). This item remains unresolved. (1/24/19) **A list of the required approvals has now been provided. This item has been resolved.**
 - B. §199-402.B requires the address and phone number of the owner/applicant to be provided on the Stormwater Management Plan. (11/21/18) The required information has not been added to the PCSM Plan. This item remains unresolved. (1/24/19) **The required information has been added. This item has been resolved.**
 - C. §199-402.B.(18) requires the following information to be provided for each proposed BMP included on the Stormwater Management Plan:
 - i. Delineation of the drainage area to each BMP. (11/21/18) This information has not been provided on the PCSM Plan. This item remains unresolved. (1/24/19) **The drainage area boundaries have now been provided. This item has been resolved.**
 - ii. Any Pennsylvania Natural Diversity Inventory (PNDI) information is to be indicated on the plan and a list of potential impacts and clearances received. If the PNDI search is clear, a note should be provided on the plan stating this. (11/21/18) A note regarding this information has not been included on the PCSM Plan. This item remains unresolved. (1/24/19) **The required note has been provided. This item has been resolved.**
 - iii. A note should be provided stating the FEMA map number and date indicating that no floodplains exist on site. (11/21/18) A note regarding this information has not been

included on the PCSM Plan. This item remains unresolved. (1/24/19) ***The required note has been provided. This item has been resolved.***

8. §199-402.E requires runoff design computations and documentation, such as BMP loading ratios, consistent with the guidelines and criteria presented in the PA BMP Manual. The stormwater management design proposes the use of 7 detention/infiltration basins with amended soil bottoms (now labeled as rain gardens). The infiltration facilities should be designed in accordance with the PA DEP Stormwater BMP Manual. The following comments should be addressed:
 - A. Note 2e on page 16 of Appendix C allows a maximum impervious loading ratio of 5:1 relating impervious drainage area to infiltration area and a maximum total loading ratio of 8:1 relating total drainage area to infiltration area. Calculations should be provided for the infiltration basins to demonstrate compliance with the noted loading ratios. (11/21/18) Loading ratio calculations have now been included in the Stormwater Management Calculations Report on page 392. The proposed footprints of the rain gardens meet the maximum loading ratio of 5:1; however, the footprints do not meet the overall maximum loading ratio requirement of 8:1 relating the total drainage area to infiltration area. The proposed overall loading ratios range from 8.5:1 to 13.73:1. This should be corrected. This item remains unresolved. (1/24/19) ***See comments above regarding design of rain gardens. The impervious drainage area ratio for Rain Garden #6 exceeds the 5:1 maximum ratio requirement. This should be corrected.***
9. §199-402.F states the inspections, operations and maintenance (O&M) requirements. The applicant shall provide an Operation and Maintenance agreement, as well as assurances and easements per §199-702 through §199-704. We have no objection to deferring an O&M Agreement until Final Plan submission but recommend that the noted easement provisions be addressed prior to Preliminary Plan approval. (11/21/18) The plans now include a blanket easement. Operations and Maintenance Notes for the rain gardens should be provided on the PCSM Plan in accordance with Chapter 6 of the PA DEP BMP Stormwater Manual (BMP 6.4.5: Rain Garden/Bioretenion). An O&M Agreement will be required prior to final plan approval. This item remains unresolved. (1/24/19) ***The Applicant is deferring the O&M Agreement until Final Plan Submission. Standard O&M notes have been added to the Post Construction Stormwater Management Plan. The specific maintenance requirements for the rain gardens, managed release concept BMPs and the wet ponds should be provided in accordance with the maintenance requirements listed in the PA DEP Stormwater BMP Manual and the PA DEP White Paper (Managed Release Concept BMPs). This item remains unresolved.***

Sewage Planning Module

Test Pit and percolation test information has been inserted in the current Planning Module submission, although no other revisions have been made. The Applicant states that Planning Module comments will be addressed in another submission. ***No information has been provided with this submission. The following comments remain:***

1. In accordance with 25 Pa Code §71.53, the Board of Supervisors has sixty (60) days to act on a complete planning module, or additional time as the applicant and Township may agree to in writing. The planning module is presently incomplete with respect to the following:

- A. Section G.3.a of the Component 2 form requires inclusion of Site Investigation and Percolation Test Report forms to document suitability for sewage disposal. Said testing forms, signed by the Chester County Health Department Sewage Enforcement Officer, must be provided. (11/21/18) Site Investigation and Percolation Test Forms have been provided but are not signed by the Chester County Health Department Sewage Enforcement Officer. Please see additional soils testing concerns noted in Subdivision and Land Development ordinance Comment 8. This item remains. (1/24/19)
 - B. Section G.6 of the Component 2 form requires inclusion of documentation to demonstrate consistency with DEP guidance regarding the PA State History Code. Required correspondence from the Pennsylvania State Historic Preservation Office is outstanding. (11/21/18) Comment remains. (1/24/19)
 - C. Section H of the Component 2 form must be completed by the Chester County Health Department (CCHD) Sewage Enforcement Officer. (11/21/18) Comment remains. (1/24/19)
 - D. Section L of the Component 2 form requires a preliminary hydrogeologic study to address concerns with water supplies within $\frac{1}{4}$ mile of the project which CCHD records document to exceed 5 parts per million (ppm) nitrate-nitrogen. No such study has been provided. (11/21/18) Comment remains. (1/24/19)
 - E. Section O of the component 3 form addresses public notice requirements. Among the conditions which would require a public notice are proposed wetland disturbance and the above noted nitrate concerns with nearby water supplies. Section O should be corrected to indicate the need for a public notice and proof of publication documenting expiration of a thirty (30) day public comment period must be provided. (11/21/18) Comment remains. (1/24/19)
 - F. Section P of the component 3 form must be completed and signed. (11/21/18) Comment remains. (1/24/19)
 - G. The Component 4A form must be completed by the Kennett Township Planning Commission. (11/21/18) Comment remains. (1/24/19)
 - H. The Component 4B form must be completed by the Chester County Planning Commission. The Applicant should coordinate with the Township regarding submission to the County, if outstanding. (11/21/18) It is our understanding that the Planning Module has been submitted to the County Planning Commission for review. This item otherwise remains unresolved. (1/24/19)
 - I. The Component 4C form must be completed by the Chester County Health Department. The Applicant should coordinate with the Township regarding submission to the County, if outstanding. (11/21/18) It is our understanding that the Planning Module has been submitted to the County Planning Commission for review. This item otherwise remains unresolved. (1/24/19)
2. Section G.1 of the component 2 form specifies planning module plot plan requirements. No separate planning module plot plan has been provided, and it is assumed that the Preliminary Subdivision and Land Development Plan is intended to serve this purpose. The Applicant should verify. (11/21/18) Comment remains. (1/24/19)

3. Section G.2 of the component 2 form has been completed to request a waiver of planning requirements for the residual tract. The planning module narrative and alternative analyses do not specify what constitutes the residual tract. It is assumed that the adjacent lots for which no lot line changes are proposed are collectively the residual tract. The planning module narrative and alternative analyses should be revised to clarify. (11/21/18) Comment remains. (1/24/19)
4. Primary and replacement sewage disposal areas should be delineated on each lot per Subdivision and Land Development Ordinance Comment 8 above to demonstrate technical feasibility of proposed sewage facilities for this project. (11/21/18) See Subdivision and Land Development Ordinance Comment 8. (1/24/19)

General

1. The Township Fire Marshal should review the Plan to verify adequacy for fire protection needs. (11/21/18) The Applicant states that they will obtain approval from the Township Fire Marshal. This item remains unresolved. (1/24/19) ***Per the Longwood Fire Company memorandum dated February 13, 2019, the comments from their previous letter have been rescinded. The Applicant states that wet ponds will be provided to meet the fire protection requirements. Adequacy of wet pond access for Fire Department use should be resolved prior to Final Plan approval.***
2. A list of the required agency approvals should be provided on the Cover Sheet. (11/21/18) The Cover Sheet has been updated to include approval blocks for the required agencies. A list of the required approvals/permits should be included on the Cover Sheet as well. This item remains unresolved. (1/24/19) ***A list of the required agency approvals is not provided on the Cover Sheet. This item has been resolved.***
3. The proposed septic areas should be protected during construction from compaction due to heavy equipment operation or storage of fill or construction material during construction. In addition, the area should be protected from sedimentation and stormwater runoff during construction by diversion berms or other features necessary to protect the facility. At a minimum, the areas should be surrounded by orange construction fence. (11/21/18) The Erosion and Sedimentation Pollution Control Plan (Sheets 15 & 16) now propose orange construction fence (OCF) around the primary septic areas. At a minimum, OCF should also be proposed around the replacement septic areas. This item remains unresolved. (1/24/19) ***OCF has now been proposed around the replacement septic areas. This item has been resolved.***
4. ***The plan indicates an existing 50' wide right-of-way traversing neighboring parcel numbers 62-4-310.5 and 62-4-310.6, which is to contain the proposed driveway for Lot 8. Recorded documentation should be provided which demonstrates that this right-of-way has been granted to the Applicant for the proposed purpose. A plan note should also be added to reference said documentation.***

These comments should be addressed by the Applicant and a revised Plan and accompanying documents should be submitted for review. It should be noted that additional comments may be generated upon receipt of a revised submission.

Please contact our office should you have any questions.

Sincerely,

AECOM



Stan Corbett
Project Manager

cc: Michael O'Brien, Kennett Township