CITY OF ALBUQUERQUE
PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

January 2, 2015

David Thompson, P.E.
Thompson Engineering Consultants, Inc
PO Box 65760
Albuquerque, NM 87193

Re: Hydraulic Analysis Addendum to the Amendment to the DMP Trails Units 1,2, and 3
Drainage Report, Engineer's Stamp Date 10-22-2014 (File: C09D001)

Dear Mr. Thompson:

Based upon the information provided in your submittal received 10-22-14, the above referenced Submittal cannot be approved until the following conditions/ comments are addressed:

1) In general, electronic models need to be documented in printed and pdf format so that any information needed in the future can be obtained without having the program itself. This review would have been greatly facilitated if the program Inputs and Outputs had been printed.
   - It would have been helpful if Appendix A (the as-builts) were in printed form showing which pipes correspond to XPSWMM links, and which Manholes correspond to nodes. In my review, I have noted this on the as-builts and included in the binder.
   - Provide an overall printed plan showing the XPSWMM model, with the nodes and links labeled. Indicate the meaning of the Blue, green, and red nodes. Indicate that dashed links are orifice plates.
   - Provide the Link and node data in tabular format. Can the" XP Table List" function/button and the "Link Summary" Tab be used to print out the pipe lengths, diameters, invert elevations, Max Flow, Time of Peak, etc.?
   - Provide printed forms of the "Inflow Hydrograph" at each node where AHYMO "punch hyds" were input. At each AHYMO ID, note which basins are included -or Plate 2 of TEC Trails DMP showing which basins are included in each AHYMO ID.
   - Provide hard copies of the "Stepwise Linear Storage" and the hydrograph for each pond
   - Print out orifice data used in model
   - Print a summary of all input values: N-values, C-values, and other pertinent analysis parameters

2) Node 163 and AHYMO ID #75 Peak flows do not match. Model uses 104.03 cfs, AHYMO has 146.48 cfs. However, AHYMO # 73, which does not include Basins D5 and D6, does have a peak of 104.03 cfs. It appears Basins D5 and D6 are not included in the model.
3) Node MH58 and AHYMO ID #21 Peak flows do not match. Model uses 28.1 cfs, AHYMO has 29.39 cfs.
4) Modeling around Pond H has following comments:

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- Link 182: As built shows 5418.65 for D/S RIM, model says 5422.8' for D/S surface for Scenario 1 (and 5423.6 for Base). Why is the WSEL used rather than the actual RIM?
- MH 4 was not modeled correctly. MH4 is a SAS line. It should be SDMH-45 from as-built. (730084, sht 37)
- It seems that a node where the overflow enters back into the system should be between Node MH4 (or SDMH45) and MH46 to be reflective of the actual system.
- What is the purpose of NODE 177 and why is it green? Can't Node MH4 (MH46) be used in place of NODE 177 since the orifice is being modeled in LINK 203? Can LINK L-H be omitted altogether?
- Table 3 shows Q_{out} = 27.4 cfs , but the Peak Outflow from the XPSWMM model 21.6 cfs. Why are these values different? If you are including in the flow from the OVERFLOW links, there should not be any contributing flows from these links as they would only be used if the orifice is clogged.
- The "Stepwise Linear Storage" for Pond H does not match the "Pond Volumes" Table. Stepwise depth 8.85', corresponds to elevation 5421 with the area = 1.27 Ac. Model shows 0.81 Ac. at this depth. Similarly, Area at 9.85' depth (5422 elev) should be 1.52 Ac. rather than 1.27 Ac.
- The Pond H emergency overflow has a grate elevation of 5422.04, but the hydrograph shows Max water elevation at 5422.96'. It seems that there would be spill out of the system. While the "OVERFLOW 1" link at U/S Invert =5422.5, it seems that it should match the overflow grate elevation of 5422.04. BHI calculated the WSEL to be 5421.9, so I would expect the invert of the overflow link to be 0.14' above the Max WSEL as well.
- The OVERFLOW links are 1' dia. and may be too small. How do you know water is not spilling out of the system? Or that they are not restricting the flow ?
- The Time of Peak for Link L-H is 5.11 hrs, but TEC Trails DMP indicates 2.4 Hrs. Why the discrepancy?
- BHI calculated 26.8 cfs though the orifice area of 1.14 sq.ft, with a head of 10.36', Why does the SWMM Model calculate a much smaller value (15 cfs) ?
- Pond H modifications indicate a 36" pipe beyond orifice plate. As-builts show 30". What is the actual pipe dia?
- L106 has an adverse slope and is modeled as such. Is there sediment that should be considered? Verify that it is a 48" dia. pipe as there is conflicting info on plan view of CPN 730084, and CPN 730075 is calling it a 54" pipe. *****
- The Design Capacity of Pond H is 3.07 Ac. in Appendix C. (Appendix B)?
- Pond H:Why is the Peak Storage in Tbl. 2 2.98 Ac-ft, as opposed to the full pond volume since it is overtopping. Furthermore, "Continuity Balance" Tab in the "Table List" function shows 3.94 Ac-ft for the Volume for Scenario 1. Could it be that Tbl. 1 was not updated?
- Orifice Plate in Pond H is to be 1.83 sq. ft.
- BHI states that their field survey indicated that the pipe out of Pond H is 36" dia, rather than 30" as indicated on the As-built. (Links L-H, and L104)

5) LINK L108, D/S Rim elev. is 5415, D/S invert is 5400.07 – neither match 730084. What CPN Job No is this taken from?
6) It seems that Table 1 needs to be updated.
7) Pond G:
   - As-built for Pond G (730084, sheet 11/51) shows MH Rim at 16.29 (vs. 15.67)

- Link L-13: D/S Invert is 5403.05 (the design value) but the As-built value is 5402.03 per CPN 730084 Sheet 20/51 for a difference of 1'. The HGL is 5410.98 and adding 1' makes it 5412. The Rim is 5411.23, so the HGL is above the Rim.
- The Links from pond G to Universe have a significantly different Hydrograph when comparing the Base to Scenario1. Can you explain why?
- Link L-24 and Link 180 discharge into Pond G through slotted manholes. Are the areas of the slotted manholes taken into account? If not, the required opening area needs to be stated on Table 3 as part of the improvements to Pond G (or any pond with slotted manholes).
- Verify negative peak flows in Links L-27 and L-29 make sense. Time of Peak Velocity for Link L-27 is 37.2, why so much later?

8) Pond F:
   - Orifice area is 4.25 for the Base Scenario but should be 1.63 sq. ft.
   - Link L-56 and L-63 are noted as elliptical on the record As-builts
   - L-63 shows HGL at 22.83 and upstream MH is 23.27, which is somewhat close.
   - Orifice plate is modeled downstream of SDMH 34, which is in Treeline Ave. Since the area is less than 3.14 Sq. ft., a sluice gate (or similar device) is required. The installation of such a device at this location seems complicated. What are some possibilities for such a device here?
   - Table 3 should be revised. Qin should change.
9) Pond D:
   - Why in the Base Scenario are there links from Pond D to Pond F5?
   - The Stepwise Linear Storage for the Base Scenario is Similar to that for Scenario 1 and does not reflect the Pond as designed in the TEC.
   - Q_{in} on Table 3 should be revised, as it states 102.5cfs. Q_{in} should be the same as from the TEC. The AHYMO Summary file ID No. 75 says 146.48 cfs. However, Table 2 from the TEC shows $Q_{100,in}$ =154.87 cfs and Q_{bypass}= 13.77 cfs. The Q_{in} should be the sum or 168.64cfs. It is not clear why there is a discrepancy.
10) Pond F5:
   - There is an inflow Hydrograph associated with Pond F5 but is not noted on Plate 1. What basins or AHYMO ID is this hydrograph from? If this is from Basins D5 and D6, I would expect the peak to be about 42.44 cfs (the additions of peaks from both basins D5 and D6) but the peak of this hydrograph is 27.4 cfs.
   - The SpillCrest in the XPSWMM model is 5428, but should be 5427.
11) Pond J:
   - The Spill crest is 5418 in XPSWMM but the emergency spillway is at 5417 from Table 2.
12) Where is as-built information for Link 213 and 215 in order to verify diameters
13) Pond K: Emergency spillway at 5410.3 per As-built rather than 5409 on Table 2.

If you have any questions, you can contact me at 924-3695.

Sincerely,

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Development Review Services

Orig: Drainage file, c.pdf Addressee via Email, Monica Ortiz

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