APPENDIX E:

PHASE 2 DATA QA/QC SUMMARY

To: Fitzgerald Environmental
From: Gretchen Alexander, VT DEC River Management
Date: 3/13/15

To: Gretchen Alexander, VT DEC River Management
From: Fitzgerald Environmental
Date: 4/2/15

Mill Brook Phase 2 SGA QA

The questions raised in this Quality Assurance assessment are meant to address potential discrepancies within the data set, uncover data entry errors, or otherwise clarify and confirm those observations that might not have been expected. It is important to take into consideration how data might be viewed or interpreted by the myriad of users who are familiar with the science and protocols but may be unfamiliar with the assessed reaches. While providing notes and comments, try to anticipate the types of questions that may arise due to outliers and exceptions observed within the reach. While attempting to clarify the data for those users wishing to utilize it years after collected, it's better to err on the side of making excessive comments than it is for them to be insufficient.

After reviewing the comments below, please update this document in a second color with what steps were (or were not) taken to address the comments/questions.

General comments:

For future assessments, I find it helpful to see photos of the ledge features. There are many reaches in this project where no photos were taken of ledge features. While it's not something necessarily required, for QA purposes it's just really helpful in getting a feel for the character of the reach. Did you include all the photos you took in your photolog or did you just submit a subset?

We did include all of our photos in the photo log. There are a number of reaches that had many grade controls for which we only took pictures of the prominent ones. We will make a point to take pictures of all grade controls during future assessments.

Step 2 Significant Flood Events: This section of the database is being used primarily to flag those locations where channel alterations associated with flood recovery efforts are severe and may hamper the ability to accurately describe channel adjustment processes or identify bankfull features based on the altered cross sectional geometry. It isn't clear to me if you are interpreting these fields in this way. Please refer to the attached memo for further clarification on the expectations related to this section of the database, specifically with regard to the channel enlargement calculation. Please review data in the DMS for this step to see if modifications to the data are necessary.

We have read through the memo and responded to your reach-specific comments below.

Reach specific comments:

M02
No comments

M04
You indicate in step 2.14 that the dominant bedform is planebed, so in step 6.9 you should indicate a SHTD from riffle-pool to planebed. Plane Bed is too harsh for the reach; updated 2.14 to Riffle-Pool sub Plane Bed

M05-A
In some of the photos it looks like headcutting is occurring through some of the aggradational features. By placing the reach in stage III of the F CEM are you implying that aggradational processes will likely overwhelm any incision that occurs through the deposits given the excess sediment working through the system? Photo 215 definitely looks like a headcut - it is a log from the bank to the mid channel bar that created a scour pool. Yes we suspect that the huge volume of flood sediments working through the reach will dominate the future adjustment processes.

M05-B
No comments

M05-C
Step 1.6 and your notes indicate the presence of grade controls, but I didn't see any photos in the file. Do you have any? Picture 294 shows a small grade control in the lower reach, I added a windshield survey picture "61" showing the gorge mid segment.

M06
x.s spreadsheet: small typo -- the x.s is labeled as segment "B", but this reach was not segmented. Corrected and uploaded.

Step 7.5 comment: small typo – change "effect" to "affect" Updated.

M07-A
No comments

M07-B
x.s spreadsheet: please indicate in the notes box the x.s. that you considered representative (the first one). Updated and Uploaded.

M08
Step 1.6 and 4.8: have a photo of one of the ledges and one of the outcrops – any others? No additional pictures. We will make sure to photograph every GC and constriction in the future.

Step 7.7: You assigned a sensitivity that is different than dictated by the protocols. Please either update or provide a justification. Thanks, we recently got rid of a departure to F and decided it was just a widened B. Sensitivity has been updated.

Phase 1 step 6.3: update to "multiple" to reflect Phase 2 observations. Updated.

M09-A
Step 2: From the photos it almost feels like an E stream type sub-reach by reference. Lots of meander scars in the valley indicating greater sinuosity than what is currently present, low valley slope, fine deposits… what do you think?
Good suggestion. We agree. Reference stream type changed to E for sub-reach.

M09-B
No comments

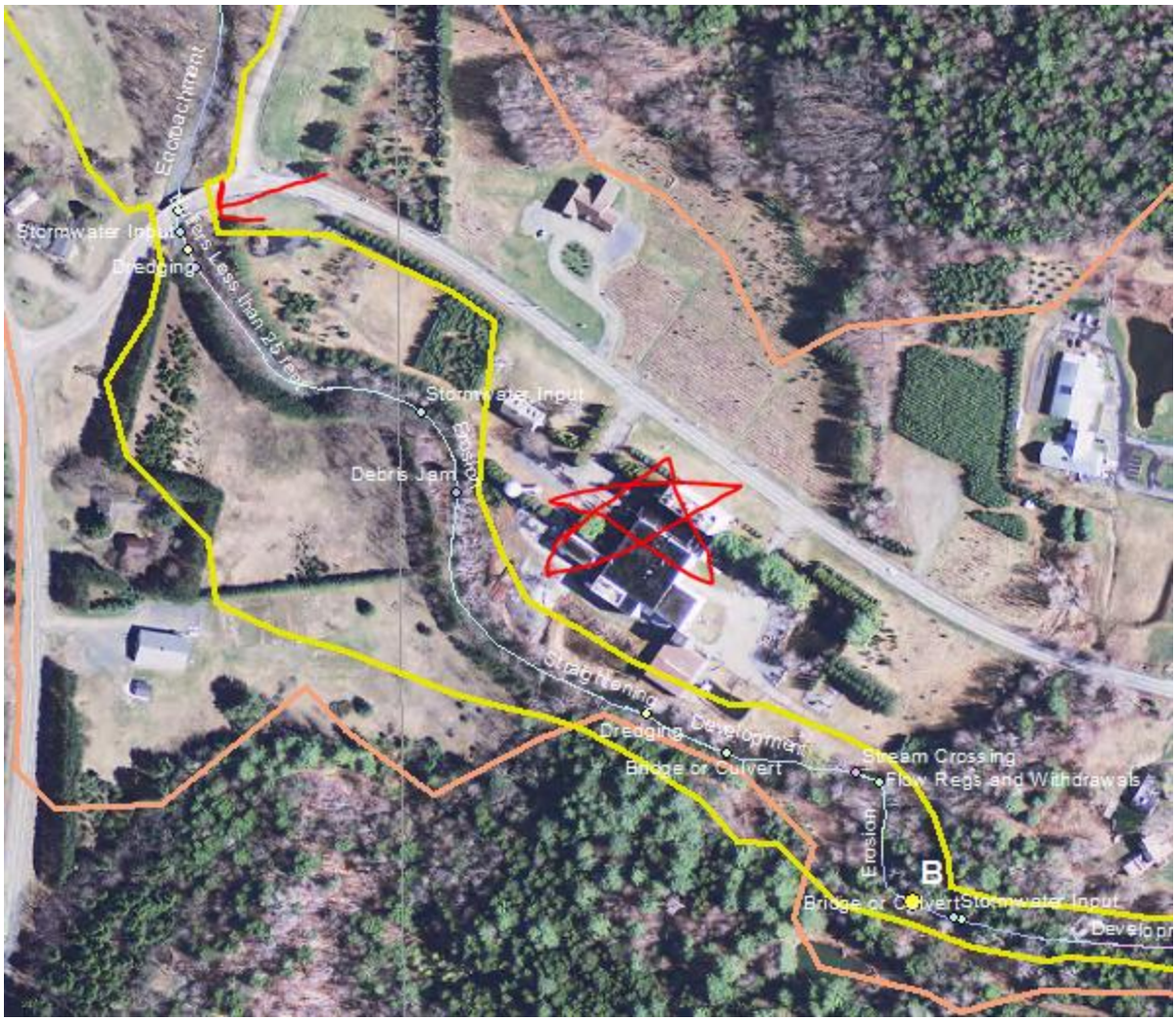
M10
No comments

M11
No comments

M12-A
No comments

M12-B
I have visited this site for an Act 250 case so am somewhat familiar with the lay of the land, and wonder about your valley wall delineation. This structure (red star) had water flowing through it during Irene, so I think it should be mapped within the valley (I think the left vw is somewhere on the opposite side of the road). I wonder if maybe the high banks were somewhat deceiving while you were mapping given the extreme level of incision that has occurred there?
Yes, this is likely true.

Also, I notice that you are mapping the valley wall based on road fill at road crossings. In these situations please approximate the valley wall in the absence of road fill. That is, if the bridge is on ledge, go ahead and map the valley wall that acknowledges the presence of an unerodible feature, but if there is fill at the approaches, map it as if the fill were not there. This results in smoother transitions of the river corridor at road crossings and helps acknowledge that road fill is vulnerable to catastrophic erosion at undersized crossings during flood events.
Edited VW to include the building and expanded at the bridge fill. We will use this approach for future VW mapping.



M13
No comments

M14-A
No comments

M14-B
Step 2.14: In your response to the question about channel dimensions being significantly altered by flood recovery efforts, are you referring to the presence of bank armoring? You didn't note any dredging, so I'm not quite certain what you are getting at. This section of the database is being used primarily to flag those locations where channel alterations associated with flood recovery efforts are severe and may hamper the ability to accurately describe channel adjustment processes or identify bankfull features based on the altered cross sectional geometry. It isn't clear to me if you are interpreting these fields in this way.
The channel along Baileys Mills Rd as it approaches the bridge is heavily modified with berming and armoring, however some of these impacts appear to be pre-Irene. Changed to "no".

M14-C
No comments

M15-A
From the photos the reach strikes me as more incised in some locations, but obviously hard to tell from just a photo. On your x.s. spreadsheet I am not seeing much of a feature at the elevation you are calling the RAF. Did you consider the flatish feature at elevation ~4.25? Either way, with this level of incision/floodplain disconnection, I wonder if we might expect to see more channel adjustment processes? Do you feel confident in calling it stage V / in regime?
You are correct about the RAF – it should have been set at 4.25, which results in IR=1.4. Excel template has been revised and uploaded to DMS. We have updated RHA (6.4) and RGA (7.1 and 7.3) lines accordingly, but have not changed our overall scores as we think this difference is very minor and doesn't change our view of channel stability and habitat ratings. We consistently saw nice low floodplain benches throughout (see pictures 759, 776). Our cross-section was taken at the only riffle that wasn't influenced by ledge or LWD, it is likely a bit more incised there than typical for the reach. We did not observed any significant widening, scour, or planform adjustment, even following a very large storm event in July and would like to keep the reach as stage V.

M15-B
Phase 1 step 6.3: update to "multiple" to reflect Phase 2 observations. Updated but kept impact at "Low".

M16-A
Phase 1 step 6.3: update to "multiple" to reflect Phase 2 observations. Updated to "multiple" and "Low".

M16-B
Step 7 comment: Small typo here, think you meant to include the word "eroded" or "incised" or "scoured" … "The channel bed of this segment was during TS Irene, removing lower benches." Added "scoured", thanks.

T1.01
No comments

T1.01.S4.01-A
Based on your x.s. dimensions this is coming out as an "F" stream type, not "G". Thoughts?
We had chosen G because of the steep slope, but F is probably a better fit due to the width to depth ratio >12. Updated to F.

Phase 1 step 6.3: update to "multiple" to reflect Phase 2 observations. Updated

T1.01.S4.01-B
Based on your x.s. dimensions this is coming out as an "E" stream type, not "C". Thoughts?
Agree. There were some sections of the reach with C-type morphology, but both cross-sections have w:d<12. Revised to E for existing and sub-reach reference.

T1.01.S4.01-C
It looks like there are floodplain features present in the upper part of the segment, as you noted in photo P113061. Did you feel this was not the dominant condition of the reach?
That photo was taken along a short stretch of different morphology at the most upstream end of the segment near the break. It was **not** the dominant condition of the reach.

You didn't map the valley wall for the upper portion of the segment. Is the "D" segment break in the correct location? The VHD is way off on this segment. The stream actually doesn't cross the road. After looking at this again, we've decided to move the C/D segment break downstream approximately 700' and extended the VW to encompass the updated segment.

T1.01.S4.01-D
No comments – not assessed

T1.01.S4.01.s4.01-D
I deleted this segment from the DMS as requested. Thanks

T1.02-A
No comments

T1.02-B
No comments

T1.02-C
No comments – not assessed

T2.01-A
Step 1.6: you note the presence of several grade controls. Do you believe these will prevent the degree of channel incision – ie, do you expect a transition to stage III in the absence of any channel management? Or given the low slope do you feel that planform adjustment will be a more dominant response (typical in low-slope E stream type settings where sometimes a D CEM predominates, which you indicated the channel might be by reference)?
All of the grade controls are in the lower third of the segment, the remainder is straightened and incised and didn't appear to have enough power to initiate planform adjustment or widening.

T2.01-B
No comments

T2.02
No comments

T2.03-A
No comments

T2.03-B
No comments

T2.04
No comments

T2.05-A
Step 7.7: You assigned a sensitivity that is different than dictated by the protocols. Please either update or provide a justification. Justification is described in Step 5. Pebble count indicates bedrock as the dominant substrate type, but cobble is likely the dominant substrate size throughout the reach. The best riffle for a cross-section happened to be in an area with more bedrock along the banks. Sensitivity will be assessed as a C3.

T2.05-B
No comments

T3.01
No comments

T3.02-A
Step 7.7: You assigned a sensitivity that is different than dictated by the protocols. Please either update or provide a justification. Given the highly manipulated nature of the segment and the potential for catastrophic failure, to you think an "Extreme" sensitivity could be justified (this is what we'd typically assign to an F3 in poor condition)? That was a typo, it's actually an F1 and therefore "High" sensitivity. The channel can't really go anywhere now that it is carved down to bedrock.

T3.02-B
No comments

T3.03
Did you consider segmentation to capture the differences between the upstream and downstream portions of the reach? We did consider segmentation however the bottom section with beaver dams has very similar geometry to the cross-section. The 400-500' stretch downstream of the culvert with numerous grade controls could be segmented, but we didn't feel like this would add a lot of useful information to the dataset for planning purposes. We have added a note in Step 5 of the DMS to briefly summarize this section.

Phase 1 step 6.3: update to "multiple" to reflect Phase 2 observations. Updated to "Multiple" and "Low".

T3.04
No comments

T4.01-A
Step 1.2: Your step 5 and 7 comments note this as an alluvial fan setting, but you have not indicated this in FIT. Please update. Indexed an alluvial fan in FIT.

x.s spreadsheet: please indicate which spreadsheet you considered to be representative for data entry purposes in the DMS. Updated and uploaded.

T4.01-B
No comments

T4.01-C
No comments

T4.02-A
No comments

T4.02-B
No comments I later noticed that Sensitivity was "Extreme" and should be "High" for a Poor condition B4 reach.

T4.02-C
No comments – not assessed