From: mcypes@hinesburg.org
To: "Wilson, William"; "Terry.Purcell@vermont.gov"
Subject: RE: Haystack
Date: Monday, February 28, 2022 11:37:00 AM

Thank you Winn for your help over the years.
Hello Terry,

It seems to me that by bypassing the CBs, the intent was to verify the ability of the main gravel wetland to theoretically provide the required treatment. Considering that the peak discharge as shown on the latest modeling will most likely never occur because large areas outside the pond will flood first and if one believes that a 48-inch square grate can be placed on a 24-inch round pipe, I can see why you did this. Then again, working for a Town, I do not have HydroCAD and must rely on PDFs for review. Has the applicant changed their modeling to address the following comment? The last on I have is printed on 1/20/2022. After more than two-years of dealing with this crap, let me first ask a larger theoretical question:

Should the modeling provided in a stormwater application reflect to the best of our knowledge what actually would occur?

For example:

1. For the 100-year storm event, discharge pipes 10P, 11P, 13P, 14P, 17P, 21P, 33P & CB1 have flood elevations that are higher than the top of the inside of the pipe, or obvert. How is this possible if the ONLY structure in the modeling for these nodes is the pipe? Is there a floating wall of water flowing above the pipe? Many of these pipes have discharges greater than what is possible per the Manning's equation. Where is this water going? Why not determine the area of the streets and surrounding ground that would be flooded? Are the proposed houses going to be flooded?
2. How is it physically possible to place a 48-inch square grate on a 24-inch pipe? This matters, because the peak discharge through the 24-inch pipe is greater than that which is theoretically possible per the Manning's equation. How can one be certain that the main gravel wetland (16P) is modeled correctly with such an error? The peak water elevation in the main gravel wetland would be higher, which could exceed the top bank elevation of the main gravel wetland.
3. At Station 4+34.7 on Field Crest Lane is a node called Catch basin #5, which has a 42-inch pipe with an invert elevation of 327.47. The corresponding obvert elevation would be 330.97. The invert elevation of a 15-inch pipe collecting stormwater from a field between two houses is 330.0. The area between the two houses will flood at least 0.97 feet before the 42-inch pipe is full. Shouldn't the Applicant show the limits of the flooded area? Why does the modeling not reflect this? Is the position of ANR that the Town's should review area flooding?
4. Why is the discharge traversing node 17P and 13P equal to the discharge from DA_1C? It seems to me that since 12P discharges to 17P, even with a time of concentration differential, the discharge into 17P and 13P should be greater than the peak discharge of DA_1C. Is this realistic?
5. Similar to comment #3, the same flooding occurs at CB#1 and CB#2, where the nearby pipe obvert is 329.50 and the inlet invert is 328.10. In addition these elevations are lower than the

peak flood elevation of the main gravel wetland. Here is another area that will flood. Shouldn't the Applicant show the limits of the flooded area? Why does the modeling not reflect this?

6. There is an area shown on the plans by the southern portion of the existing recreation parking area that is a vast low area with no way to drain. This area will always flood during any storm. Even if a drain is provided, the elevation is lower than the 100-year peak flood elevation of the main gravel wetland. It will flood before the main gravel wetland fills to the elevation shown in the modeling. Shouldn't the Applicant show the limits of the flooded area? Why does the modeling not reflect this?
7. I can add more, but I will end with this one. Is it reasonable to use the side of a building, Building 'H', as part of the berm for gravel wetland #2?

Terry, it would be appreciated if you can look at these comments. If that is not possible, I will plan in the next few days to create an ENB login and place these comments on the website. I will contact Terry if I have a problem doing this.

Seriously, thank you again Winn for the help you have provided these last few years and good luck in your new position.

Mitch

Mitchel Cypes, P.E.
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From: Wilson, William <William.Wilson@vermont.gov>
Sent: Friday, February 25, 2022 2:46 PM
To: mcypes@hinesburg.org
Subject: RE: Haystack

Hi Mitch,

My intention was to get the review to a point where I could hand it off to Terry. I routed the modeling to bypass all of the CB's to see specifically how the practices themselves managed the flow as the drainage areas have time of concentration already built in and was satisfied through the Q100 flow in that regard.
Based on that review and peak elevation, in addition to some of the contour changes on the most recent plan amendment, I believe the flooding analysis that I discussed in the letter aligns with the remainder of your comments.
The application will not be put on public notice until they have satisfied that request and additionally have given wetlands and the rivers programs the material they require for review. If there is still a need for comments they should be submitted through the ENB. You will need to create an account and can then select the type of permits and geographic location you want to be notified about which

should ensure that you are notified as this stormwater permit progresses.
The final issue I see for stormwater permitting with this project is the peak elevation at some of the inlets during the Q100 event, and the extent of the ponding.
I will still be involved to the extent needed, but otherwise have passed the project on to Terry.

Thank you,
Winn

From: mcypes@hinesburg.org <mcypes@hinesburg.org>
Sent: Thursday, February 17, 2022 4:01 PM
To: Wilson, William <William.Wilson@vermont.gov>
Subject: RE: Haystack

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Hi Winn,

Hope you are well and enjoying your new position. I am a little surprised by the letter to Ben and his team before receiving a response to the comments I submitted are answered. I checked the Environmental Notice Bulletin and saw that Terry Purcell is now listed as the contact. Are you still working on Haystack? Should I be contacting Terry Purcell? I have never had to make official comments on a project with ANR, is there a special procedure?

Thank you for all the assistance you have provided over the years.

Mitch

Mitchel Cypes, P.E.
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10632 Route 116, Hinesburg, VT 05461

From: Wilson, William <William.Wilson@vermont.gov>
Sent: Friday, January 28, 2022 9:15 AM
To: mcypes@hinesburg.org
Subject: RE: Haystack

Hi Mitch,

To follow-up from our conversation and my e-mail to applicant I have responded to your comments below. Again, thank you for the detailed review.

Winn

VERMONT

Winn Wilson | Environmental Analyst
Vermont Department of Environmental Conservation
Watershed Management Division | Stormwater Program
Davis 3, 1 National Life Dr | Montpelier, VT 05620-3901
802-490-8019
https://dec.vermont.gov/watershed/stormwater

From: mcypes@hinesburg.org <mcypes@hinesburg.org>
Sent: Sunday, January 23, 2022 9:42 PM
To: Wilson, William <William.Wilson@vermont.gov>
Subject: RE: Haystack

Hi Winn,

Thank you for the opportunity to review the stormwater modeling prior to a permit. There were many stormwater concerns on this project noted during the Town review, some of which I have communicated to you in the past. I do see some improvements to the modeling, such as larger pipe sizes and use of the lag method for time of concentration. Unfortunately, there still seems to be some of the same significant concerns that I had raised during the Town review. Please note that most of my attention is on the conveyance of the 100-year storm event. Here are some comments:

0. The modeling diagram – This is comment '0' because I don't expect a change on this, but most modeling diagrams mimic the proposed development. This one does not, which makes it harder to read. It has lines that cross each other, which rarely happens in the real-world. Is there is a regulatory standard on this?
   There is not a layout requirement for modeling as long as it all is directed/conveyed to the correct place.

1. 12P Disconnection – The peak discharge from subcatchment area 1C is 21.47cfs @11.99 hours. The peak discharge from pond 12P is 8.90 @12.49 hours. Both of these discharges go to 'pond 17P', which has a peak discharge of 21.47cfs @11.99 hours, which is the same as that from subcatchment area 1C. Peak time differential will result in a lower peak discharge from a down-stream node than the sum of those upstream. However, since the discharge of 17P equals that of 1C, it appears that pond 12P is disconnected from the modeling. Connecting 12P to the overall discharge would increase the post-development 100-year peak discharge, perhaps to a discharge that is greater than the pre-development 100-year peak discharge.
   I reviewed the hydrograph output in excel for this and there are 3 time steps where the

discharge from this pond is 0 cfs, this appears to be due to oscillations in the model run as a result of the peak elevation in the CB 12P discharges.

2. Unrealistic flood elevations – 'Ponds' 10P, 11P, 13P, 14P, 17P, 21P, 33P, and CB1 have unrealistic flood elevations. The only 'storage' in the modeling is the pipes themselves. If these were modeled as catchbasins using the pipes as an outlet, then the flood elevations would be acceptable and the modeling would show how high in either the catchbasin or the surrounding roadway area, stormwater would reach. I encouraged the applicant's hydrologist to do this in the Town review. Without this in the modeling, the flood elevation has to be the top of the inside of the pipe, or **obvert**. The table below shows in detail the 100-year storm event in the discharge pipes:

'Pond'	Invert Elevation	Diameter Inches	Obvert Elevation	Flood Elevation	Peak discharge Elevation
10P	345.50	24.0	347.50	351.50	352.70
11P	339.90	36.0	342.90	345.05	349.03
13P	331.13	24.0	333.13	338.10	342.81
14P	329.52	42.0	333.02	337.10	339.46
17P	331.55	24.0	333.55	338.30	344.36
21P	326.98	42.0	330.48	333.50	330.45
33P	328.90	30.0	331.40	333.80	331.63
CB1	326.00	42.0	329.50	331.15	330.21

In the table the flood elevations and peak discharge elevations are above the obvert, which can not happen in the way that this project is modeled.
Agree, I have requested that they include the horizontal grate at the rim elevation to allow for overflow and calculate the volume discharged out of the grate vs. available surface storage or include the surface storage in the model.

3. Flooding – With the exception of 21P, all of the peak discharge elevations as shown in the table above, are greater than the obvert elevation. Where does the stormwater discharge go? Is the applicant's hydrologist claiming that there will be a wall of water flowing over the pipe? Will this project create new 100-year flood areas? If the modeling changes on 21P to reflect the correct flood elevation, would the peak elevation change to be greater than the obvert?
Addressed above

4. Pond '15P' – The limits of Pond '15P' are not shown on the plans. How large of an area is utilized for stormwater storage? What needs to be maintained? The Applicant is proposing to convey this property to the Town. To evaluate another proposal to the Town, information on this is essential. Will the Town be limited as to where and how this property is developed? It should be noted that the outfall during a 100-year storm, stormwater will overtop the adjacent roadway.
I have requested that they show the extent of ponding on the plans in locations where storage is anticipated during the 100-year event prior to entering the open culvert invert.

5. Freeboard – Section 4.3.6.2 of the VSMM requires a 1-foot minimum freeboard on the edges of wet ponds. I believe for structural reasons the top of the berms are required to have a minimum width of six or eight feet. It appears that gravel wetland #1 (6P), gravel wetland #2 (5P), gravel wetland #4 (4P) and the main gravel wetland (16P) do not meet these standards. Will these ponds be structurally insufficient due to insufficient freeboard and berm width?
   Some of the gravel wetlands have unusually large emergency overflow areas because they are discharged over the walkway during the extreme flood event. This is somewhat unusual but not prohibited, there is stabilization called out on the plans in addition to a level spreader downslope of path. Gravel wetland #2 was the only one I noted where there is not 1' of freeboard from the storage elevation (emergency overflow elevation) to the top of the berm.

6. Building Berm? – Gravel wetland #2 (5P) uses the side of a building (H) as part of its berm on the northeast side. In the 100-year storm event, the stormwater on this pond will be on the building. Is that allowable? Would the building be considered in the floodplain?
   I have included this is my comments to be addressed by the applicant.

7. Inlet elevation that is lower than a pipe obvert – Catch basin #5 at Station 4+34.7 on Field Crest Lane is a 42-inch pipe with an invert elevation of 327.47. The obvert would be 330.97. The invert elevation of a 15-inch pipe collecting stormwater from a field between two houses is 330.0. With an outlet lower than the obvert, an area between these two houses will flood. The limits of this area that floods should be determined.
   This may be acceptable as long as enough ponding area is provided in the grassed area at the inlet invert of the 15" pipe. Needs to be depicted properly in modeling and plans.

8. Disconnection areas – On the plans, disconnection areas are shown extending from some of the proposed single-family residences. Should development be limited in these areas? Some of these extend on to a property that the applicant is proposing to transfer to the Town. The Town needs to know the expected limitations.
   The disconnection areas are shaded in gray, these areas need to maintain the required slope and vegetation for the entire shaded area so development would not be allowable in those areas.

9. Orifice larger than pipe – On the outlet of the main gravel wetland, 16P, there is a 48-inch orifice on a 24-inch diameter pipe. How is this possible? This apears to allow a greater discharge from the pipe than what should be possible mathematically.
   We discussed this on the phone, this is an acceptable way to model the outlet structure because the discharge will still be limited by the 24" outlet pipe.

10. Low flow orifice tolerance – The applicant's hydrologist has designed some orifices for channel protection discharge to the tenth of an inch. When having an inspection for conformance to the proposed design, what tolerance should be used in this measurement? One-twentieth of an inch?
    We discussed this as well. Generally, when I inspect sites for operational compliance I would

measure to the nearest ¼". So if there was some odd sizing in the model and plans the field installation would need to be within less than a ¼" of the specified orifice size.

Please advise on the review process. Let me know if more information is needed for an adequate response to these comments.

Mitch

Mitchel Cypes, P.E.
Hinesburg Development Review Coordinator
mcypes@hinesburg.org
802-482-4211
10632 Route 116, Hinesburg, VT 05461

-----Original Message-----
From: mcypes@hinesburg.org <mcypes@hinesburg.org>
Sent: Thursday, January 20, 2022 12:34 PM
To: 'Wilson, William' <William.Wilson@vermont.gov>
Subject: RE: Haystack

Thanks Winn,

I see that you removed some redundancy and the stream flow, which should be fine. I will review and let you know my thoughts.

Mitch

Mitchel Cypes, P.E.
Hinesburg Development Review Coordinator mcypes@hinesburg.org
802-482-4211
10632 Route 116, Hinesburg, VT 05461

-----Original Message-----
From: Wilson, William <William.Wilson@vermont.gov>
Sent: Thursday, January 20, 2022 11:21 AM
To: mcypes@hinesburg.org
Subject: RE: Haystack

Hi Mitch,

See attached report, I had to remove some nodes to get the total to 40 so that I could run the report (there is a node limit on our program). Also attached is the overall diagram so you can see what I removed, I only took out reaches and drainage areas that did not go to a practice or closed conveyance.

Thanks,
Winn

Winn Wilson | Environmental Analyst
Vermont Department of Environmental Conservation Watershed Management Division |
Stormwater Program Davis 3, 1 National Life Dr | Montpelier, VT 05620-3901
802-490-8019
https://dec.vermont.gov/watershed/stormwater

-----Original Message-----
From: mcypes@hinesburg.org <mcypes@hinesburg.org>
Sent: Tuesday, January 18, 2022 4:20 PM
To: Wilson, William <William.Wilson@vermont.gov>
Subject: RE: Haystack

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Thank you for the offer, but I don't have the program. Could you create an output PDF of the post development 100-year storm event and send that to me?

-----Original Message-----
From: Wilson, William <William.Wilson@vermont.gov>
Sent: Tuesday, January 18, 2022 4:11 PM
To: mcypes@hinesburg.org
Subject: RE: Haystack

Thanks Mitch,

The most recent modeling I have is a HydroCAD file, would you like to take a look at that?

Winn

Winn Wilson | Environmental Analyst
Vermont Department of Environmental Conservation Watershed Management Division |
Stormwater Program Davis 3, 1 National Life Dr | Montpelier, VT
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802-490-8019
https://dec.vermont.gov/watershed/stormwater

-----Original Message-----
From: mcypes@hinesburg.org <mcypes@hinesburg.org>
Sent: Tuesday, January 18, 2022 3:51 PM
To: Wilson, William <William.Wilson@vermont.gov>
Subject: FW: Haystack

EXTERNAL SENDER: Do not open attachments or click on links unless you recognize and trust the sender.

Winn,

I took a quick look at the plans for Haystack. Nice that they are actually placing two 42-inch pipes along the main road, which they call Field Crest Lane. I wanted to do one full review with the modeling, but, I remembered something that you may want to consider sooner rather than later.

Discharging into and out of catch basin #5 at Station 4+34.7 on Field Crest Lane is a 42-inch pipe with an invert elevation of 327.47. The interior top of pipe elevation would be 330.97. Coming into catch basin #5 is the discharge from catch basin #6, which includes discharge coming from a 15-inch pipe collecting stormwater from a field between two houses. The invert elevation on this pipe is 330.0. If the 42-inch pipe is nearly full, stormwater is going to come out of the pipe that collects stormwater between the two houses on the north side of Field Crest Lane.

A similar and more extreme situation occurs at Station 7+23 on Field Crest Lane, where the invert of the 42-inch pipe has an elevation of 326.00, a top of the interior part of the pipe elevation of 329.50, and an inlet pipe to the outside with an invert of 328.1. Stormwater would flood the area between the last house on the north side of 'Field Crest Lane' and the recreation fields.

Let me know your thoughts. I look forward to reviewing the modeling.

Mitch

-----Original Message-----
From: mcypes@hinesburg.org <mcypes@hinesburg.org>
Sent: Friday, January 14, 2022 4:07 PM
To: 'Wilson, William' <William.Wilson@vermont.gov>
Subject: RE: Haystack

Hi Winn,

I hope you and yours are well. Thank you for the updated plans. Can you send me their latest stormwater modeling?

Mitch

Mitchel Cypes, P.E.
Hinesburg Development Review Coordinator mcypes@hinesburg.org
802-482-4211
10632 Route 116, Hinesburg, VT 05461

-----Original Message-----

From: Wilson, William <William.Wilson@vermont.gov>
Sent: Thursday, January 13, 2022 1:28 PM
To: Benjamin Avery <ben@blackrockus.com>; Mitchel Cypes <mcypes@hinesburg.org>
Subject: RE: Haystack

Thank you Ben, I'll discuss with Mitch and follow up afterwards.

Mitch - See attached comments and response as well as the most recent plan updates (link in attachment).

Let me know if there is anything you would like to discuss.

Thank you,
Winn

Winn Wilson | Environmental Analyst
Vermont Department of Environmental Conservation Watershed Management Division | Stormwater Program Davis 3, 1 National Life Dr | Montpelier, VT
05620-3901
802-490-8019
https://dec.vermont.gov/watershed/stormwater

-----Original Message-----
From: Benjamin Avery <ben@blackrockus.com>
Sent: Thursday, January 13, 2022 10:00 AM
To: Wilson, William <William.Wilson@vermont.gov>; Mitchel Cypes <mcypes@hinesburg.org>
Subject: Haystack

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Winn,

Good morning, I hope all is well. I spoke to Mitch this morning and we agreed a letter from you to the DRB stating that the design meets the standard to notice a draft permit, should be sufficient. We understand your need to coordinate with other ANR departments on draft permitting and really what this condition is meant to do is close the book on design standards.

I have copied Mitch here as he wanted to confirm a couple design flow items prior to the letter. Please keep me in the loop.

Thanks and we are trying to wrap this all up by early next week as we know that you are shifting roles. Enjoy the day!

Best Regards,

Benjamin Avery
President
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