

DATE: October 24, 2019

TO: Eastern Environmental Law Center

FROM: Geoffrey M. Goll, P.E. & Mark Gallagher

RE: Analysis of Transco's Responses to Public Comments on Its
Freshwater Wetlands Individual Permit application for the Proposed
Northeast Supply Enhancement ("NESE") Project (Program Interest
#: 0000-01-1001.3; Activity #: LUP 190001)

I. Overview

Transco submitted to the New Jersey Department of Environmental Protection ("DEP") responses (dated September 4, 2019 and September 9, 2019) to public comments on the above-referenced permit application. In particular, this submission contained (1) a "comment/response matrix" as Attachment A, which included Transco's responses to public comments on the NESE Project's potential onshore water impacts and (2) an Attachment B, which included Transco's responses to public comments on the issue of "extraordinary hardship" under N.J.A.C. 7:7A-10.4.

Based on Princeton Hydro's review, Transco's responses regarding the Project's potential onshore water impacts and the issue of "extraordinary hardship" do little to clarify the deficiencies we had previously identified. Thus, it remains our professional opinion that the onshore portion of the NESE project -- including the Madison Loop and Compressor Station 206 -- has significant deficiencies regarding full compliance with New Jersey's environmental statutes and regulations, including the Freshwater Wetlands Protection Act ("FWPA")¹ (and its related regulations) and the Stormwater Management Act Rules.

The following analysis discusses in more detail some – but not all – of the specific instances in which Transco's responses are insufficient and faulty.

II. Analysis

A. "Extraordinary Hardship"

In Section II of Attachment B of Transco's September 4, 2019 Response to Public Comments, Transco states that "the denial of the [Freshwater Wetlands] permit imposes an extraordinary hardship on Transco due to the circumstances peculiar to the

¹ N.J.S.A. 13:9B-1 et seq.

property.”² Princeton Hydro’s August 23, 2019 Report has already explained why we do not believe that the hardship expressed by Transco is due to circumstances unique to the Compressor Station 206 site and instead is directly related to Transco’s poorly conceived and biased site selection process as well as its due diligence failures. Here, we elaborate on our position further as a reply to Transco’s responses to public comments related to this issue.

1. Response #4 (“Acquisition of an Easement in the Higgins Farm Access Road”)

It is important to understand that Transco selected a site with only one access road option. Based on Transco’s detailed discussion regarding its inability to construct an access road on the adjacent Higgins property, it is clear that Transco was well aware, or at least should have been, that access through the Higgins Farm was not a viable option. In Transco’s response #4 (“Acquisition of an Easement in the Higgins Farm Access Road”), it is stated that “[a]s Transco has repeatedly stated in its permit application and subsequent submittals, Transco cannot condemn property in which the United States or one of its agencies has an interest in the property. Because the USEPA has an interest in the Higgins property, Transco cannot condemn the necessary easement in the property.” The response goes on to conclude that “[s]ince the only legal mechanism by which Transco could obtain an easement to expand and use the Higgins Farm access road is through condemnation, Transco would be unable to acquire the necessary property rights in the Higgins Farm access road. Accordingly, the Higgins Farm access road is not ‘available and capable of being carried out’ and is, therefore, not a practical alternative under the Freshwater Wetlands Protection Act Rules.”

As the Higgins Farm had been proposed by the USEPA for inclusion on the National Priorities List (NPL) in June 1988, access limitations to this property through eminent domain cannot be considered a new situation and this site-related constraint was well established when Transco acquired the Compressor Station 206 property. Transco’s description regarding why it cannot condemn a portion of the Higgins Farm property for an access road indicates that it was – or, at least, should have been – well aware of this issue prior to its acquisition of the compressor station property. As such, Transco was left with only one access road option, an option that required impact to wetland. It is thus apparent that Transco didn’t consider this access road impact as being problematic or seek to incorporate the access road’s wetland impact into its decision-making process relative to seeking a non-wetland alternative when deciding to purchase the site. If Transco had pursued a non-wetland alternative – as set forth by regulation – it could have avoided the impacts to exceptional resource value wetlands and transition areas that are now proposed.

2. Response #6 (“Barred Owl”)

With regard to the barred owl, Transco laments in its response that it did not have “access to the private properties surrounding the compressor station site and, therefore, was unable conduct [sic] surveys for the purpose of identifying the full extent of potentially suitable habitat for the barred owl. As described in its permit application, in

² Transco’s Responses to Public Comments (dated September 4, 2019), Attachment B, pg. 8.

lieu of field surveys, Transco applied the methodology used by New Jersey Landscape Project to identify the area of potentially suitable habitat." As discussed in our August 23, 2019 Report, the presence of this species could have been reasonably contemplated in the site selection process as -- by Transco's own calculations -- there are 379 acres of adjacent contiguous habitat. The presence of a large tract of forest on a diabase ridge should have created a sufficient level of concern for Transco to conduct a thorough evaluation of the site for listed species during its initial site selection process. Large tracts of forest in central New Jersey -- especially on diabase ridges -- often possess remnant populations of species such as barred owl and red shouldered hawk. This should come as no surprise to Transco as, just a few years ago, barred owl and red shouldered hawk were both identified on Princeton Ridge during the permit review process of its Leidy Pipeline project³. For the NESE Project, Transco had ample opportunity to conduct a similar study to that done by BR Environmental, LLC of Florham Park, NJ 07932 for the residents of Princeton Ridge⁴ to evaluate the potential for barred owl habitat to exist in the vicinity of their project site. The barred owl study conducted by BR Environmental, LLC was an auditory survey performed in accordance with the procedures outlined in the NJDEP document entitled "Protocols for the Establishment of Exceptional Resource Value Wetlands Pursuant to the Freshwater Wetlands Protection Act (NJSA. 13:9B-1 et seq.) Based on Documentation of State and Federal Endangered or Threatened Species January 2013." These surveys required the playing of tapes of barred owl vocalizations and waiting for a response. This type of survey does not require trespassing and can be done from publicly accessible areas. Thus, there is no reason that would have precluded Transco from doing a similar survey for the NESE Project to that done at Princeton Ridge. Transco's failure to perform adequate due diligence in its site selection process means its current claim of "extraordinary hardship" is of its own making.

3. Similarity to FWPA Rules' Requirements for Hardship Transition Area Waivers

It is Princeton Hydro's position that Transco must also consider the language regarding a hardship at N.J.A.C. 7:7A-8.4 Transco did not consider compliance with this section of the FWPA Rules in its current permit application. Transco should be made to address these requirements.

Importantly, the requirements under the FWPA Rules for a hardship transition area waiver (N.J.A.C. 7:7A-8.4), discuss the limitations resulting "from unique circumstances peculiar to [a] site" and state that the circumstances are not "the result of any action or inaction by the applicant, the site owner or the owner's predecessors in title." Due to a variety of reasons, Princeton Hydro contends that Transco's situation is not due to circumstances peculiar to the site but are directly related to the Transco's failure to perform adequate due diligence prior to its acquisition of the property. It remains our

³ Environmental Summary Report - Transcontinental Gas Pipeline Skillman Loop File Nos. :0000-13-0012.2 FHA 140001 (FHA IP) :0000-13-0012.2 FWW 140001 (FWP). April 8, 2015

⁴ Rare Wildlife Sighting Report, "Barred Owl", (*Strix varia*). BR Environmental, LLC, 54 Park Street, Florham Park, NJ 07932. Report Submitted on Behalf of: Princeton Ridge Coalition.

See Wander Ecological Consultants, "Endangered and Threatened Species and Vernal Habitats Affecting The Northeast Supply Enhancement Project In Franklin Township, Somerset County, And Sayreville Borough, Middlesex County New Jersey" (April 30, 2019). May 19, 2014.

position that Transco's alternatives analysis lacked objectivity and was biased toward selecting its preferred site, as it is the site Transco already owned. As such, we do not believe that there was adequate effort put into identifying a location that minimized wetland impacts.

4. Similarity to FWPA Rules' Requirements to Make Reasonable Attempts to Remove or Accommodate Constraints

N.J.A.C. 7:7A-10.3(c)4, which was cited in DEP's June 5, 2019 Denial Letter, states that "in cases where the applicant has rejected alternatives to the project as proposed due to constraints such as inadequate zoning, infrastructure, or parcel size, the applicant has made reasonable attempts to remove or accommodate such constraints." The constraints listed by Transco include their inability to gain access through the Higgins Farm and the presence of exceptional resource value wetlands and transition areas. As discussed above, Transco was – or should have been – aware of the constraints associated with the Higgins Farm and it was Transco that either did not consider or selected to not perform a barred owl survey even after its experience with Princeton Ridge. Moreover, Transco's alternative analysis was not exhaustive (as it purports), as it purposely eliminated the use of multiple parcels or previously developed parcels. As such, due to Transco's selectively limited alternatives analysis it has not demonstrated that it has "made reasonable attempts to remove or accommodate such constraints." Importantly, the constraints identified by Transco should be specifically related to Transco's inaction and due diligence failure.

B. Impacts to Regulated Areas and Temporary Versus Permanent Impact

Transco's responses (Comments 35, 47 and 48) do not address Princeton Hydro's August 2-19 comments. As indicated in our previous comment letter of August 2019 the NJDEP requires a greater level of analysis than that provided by Transco in order to evaluate the impacts that the regulated activities associated with the NESE project will have on New Jersey's wetlands and wetland transition areas. Section N.J.A.C. 7:7A-16.7(a)4ii of the FWPA indicates that an applicant shall include a description of "All proposed regulated activities; the size, location, and details of any proposed structures, roads, or utilities; details of any clearing, grading, filling, excavation, and dredging; the location and area of wetlands, transition areas, and/or State open waters that will be disturbed and the limits of disturbance". A detailed description of Transco's activities within the proposed limit of disturbance such as that related to earth moving was not provided in the application and thus Transco's application remains incomplete.

Instead, Transco provided generalized responses that do not offer any detail regarding what is intended to occur in regulated areas. For example, in response No. 47 Transco states following "t(T) the extent practical, Transco will restore the right-of-way to existing contours, including steep slopes, in a manner that maintains slope stability and promotes revegetation." As set forth in N.J.A.C. 7:7A-16.7(a)4ii shall describe the size, location and details of proposed regulated activities. Keeping the requirements of the FWPA in mind, it is apparent that Transco has no intention of providing any detail of the proposed regulated activities as required. Based on the response provided by Transco it is

indicated that slopes within the right-of-way will be restored; however, no discussion of grading into slopes is provided in the application.

A detailed understanding of the degree of impact to which a regulated area will be proposed is essential to determining if the impact is temporary or permanent. It is Princeton Hydro's interpretation of the regulations that the regrading of wetlands or wetland transition areas outside of the right-of-way pipe should be categorized as being a permanent impact as it far more invasive and the impacts more long lived than the minor activities described in the Freshwater Wetlands Protection Act. It is apparent in the applications submitted to the NJDEP that significant grading is contemplated to construct this pipeline project, including in regulated areas. However, the FWW IP fails to accurately describe this activity and the impacts associated with grading in wetlands as well as in wetland transition areas. Our previous report describes our concerns regarding these issues as well as those related to acid producing soils and hydrology that Transco failed to adequately address.

C. Stormwater Management Plan for Compressor Station 206

We first note that Transco's responses regarding the stormwater system for Compressor Station 206 are on the topic of engineering and, therefore, warrant a response by the Project's design engineer. Based on the vague format of Transco's response documents, however, it is unknown whether it was an engineer that authored the responds on the stormwater system; Transco's cover letter dated September 9, 2019 is signed by Joseph Dean (whose title is "Manager, Environmental Health and Safety"), while the "comment/response matrix" entitled "Attachment A" does not provide any specific author(s). This issue is especially concerning because we found that several of Transco's responses on the stormwater system are not consistent with the Project's design plans. Any response to comments regarding engineering plans that were signed and sealed in accordance with 7:7A-16.2 (h) should be addressed by the design engineer. In this regard the Stormwater Report submitted by AECOM does not identify the design engineer and does not include the engineer certification required by 7:7A-16.2 (l) and (j). In the absence of a formal engineering response by the designer to specific design questions and comments, little merit should be placed on Transco's responses to comment regarding Compressor Station 206.

After reviewing Transco's responses, Princeton Hydro maintains our view -- discussed in our August 23, 2019 Report -- that Transco's Stormwater Management Plan neither (1) satisfies the "Goals of stormwater management planning" set out at N.J.A.C. 7:8-2.2 nor (2) complies with the minimum standards set forth in N.J.A.C. 7:8. We discuss in detail below the flaws in Transco's responses.

In general, we stress that we continue to believe that the stormwater basin as currently designed is too small to satisfy New Jersey Stormwater Rules and, if it were correctly designed, would be larger and thus encroach upon additional barred owl habitat buffer (i.e. exceptional resource value transition area) on the site (as was the case with the prior design of Compressor Station 206). Thus, until Transco designs an

infiltration basin that fully satisfies the requirements of N.J.A.C. 7:8, the extent of the Project's impacts cannot be fully determined.

1. Response # 9 (“Application of Curve Numbers”)

Transco restated its position that a CN value of 96 for the acres of gravel surfaces proposed is inaccurate and that Transco's design utilizing the TR-55 CN values of 85 to 91 is highly conservative. Transco continues to underestimate stormwater runoff due to its lack of understanding that the CN numbers used are for gravel roads with right-of-way (ROW) -- composite values that do not reflect the proposed design conditions. The CN values used by Transco for the gravel-covered portions of the site are based on a composite CN that considers the infiltration capacity of pervious areas (i.e lawn or mowed herbaceous vegetation) in a ROW, plus the impervious nature of the road surface itself. The values set forth in TR-55 range from 76 to 91 and are dependent on the hydrologic soil group (HSG) classification of the pervious part of the right-of-way. The impervious surfaces associated with the CN value for gravel road with ROW used by AECOM do not exist in the compressor facility. The use of this CN value will significantly underestimate runoff. Although there is no published CN value for a gravel surface *excluding* a right-of-way, HydroCAD does include an option for gravel surfaces without a ROW. This option would best reflect the proposed conditions at the compressor station 206 site.

We also note that the applicant used the latest version of the HydroCAD software to perform its stormwater analysis. This version of HydroCAD provides an option for the user to enter a CN value for Gravel (w/out right-of-way) or gravel surface. The CN value provided in HydroCAD for gravel surface is 96 for all Hydrologic Soil Group conditions (see Figure 1 below). AECOM had the option to use the more applicable CN value for gravel surface (gravel w/o right-of-way) but instead selected the CN value that misrepresents the site's conditions and, therefore, underestimates the post-development runoff condition.

Figure 1: HydroCAD Curve Number Reference

Streets and roads						
Paved; curbs and storm sewers		98	98	98	98	Paved roads w/curbs & sewers
Paved; open ditches (w/ROW)	50% imp	83	89	92	93	Paved roads w/open ditches, 5
Gravel (w/o right-of-way)		96	96	96	96	Gravel surface
Gravel (w/ right-of-way)		76	85	89	91	Gravel roads
Dirt (w/ right-of-way)		72	82	87	89	Dirt roads

Reinforcing our position on the CN value of gravel surfaces is the fact that HydroCAD provides the following description relative to the application of CN values, such surfaces: “TR-55 provides CN values for ‘gravel streets and roads’ including the right-of-way, but it

doesn't provide a CN for the gravel surface alone. However, the TR-55 values appear to be based on 30% gravel with CN=96 and 70% 'open space' in poor condition. So 96 would be a reasonable value to use for the roadway surface alone, since it is highly compacted and has minimal absorption capability."⁵ In addition, a similar explanation was provided on Eng-Tip.com (<https://www.eng-tips.com/viewthread.cfm?qid=278935>) [See Attachment 1 of this Report ("Curve Number for Gravel Parking Areas")] in which the curve number for gravel with right-of-way was based on 30% gravel with a CN of 96 and 70% open space in poor condition. Importantly, the basis for this clarification of CN values is supported by the creators of TR-55, the Natural Resource Conservation Service (NRCS). Previously, Princeton Hydro was involved in a project and teamed with a company called Watershed Consulting Associates, LLC. In email correspondence between Watershed Consulting Associates LLC. and Quan D Quan of NRCS-West National Technology Support Center⁶, Mr. Quan supported the use of a higher curve number than that used by AECOM. In this email exchange, Mr. Quan states that -- depending on the use of the proposed gravel surface -- the curve number could vary from 95 to 98 [See Attachment 2 of this Report ("Communication with NRCS National Technology Support Center")]. Princeton Hydro communicated with Mr. Quan on October 10, 2019 to reaffirm his position regarding the applicability of a CN value of 96 for gravel surfaces. He stated that this number was based on research and would be more accurate than the composite number of gravel road with right-of-way.

Transco (via AECOM) must be aware of the option in HydroCAD, as it selected to describe that the gravel surface proposed at the Compressor Station 206 site will not be highly compacted and, as such, does not warrant the CN value of 96. This argument is not consistent with AECOM's design plans and supporting documentation submitted to the DEP. Contrary to Transco's response that the gravel will be loose, the stormwater report indicates that "Soil compaction will be limited to the areas required for roadways, permanent equipment and buildings."⁷ At another Transco site, the Chesterfield, NJ Compressor Station, the stormwater report states that "soil must be compacted for the roadways and for the area within the substation limits in order to ensure stable grades."⁸ This same report also indicates that "Fill areas will have to meet compaction requirements."⁹ The construction of Compressor Station 206 will also require the use of heavy construction equipment that will compact the soils below the gravel layer. Transco's claim that the gravel will remain loose is inconsistent with the design plans. It is this type of discrepancy that necessitates a formal engineering response from the design engineer.

⁵Hydro CAD, Stormwater modelling. Curve Numbers. <https://www.hydrocad.net/curvenumber.htm>

⁶ The Natural Resource Conservation Service is the division of the USDA that developed the TR-55 program and CN runoff coefficient values.

⁷ **Stormwater Management Report for Northeast Supply Enhancement Project, Compressor Station 206, Franklin Township, Somerset County, New Jersey. June 24, 2019. Prepared by AECOM. Page 4**

⁸ GAI Consultants, Transcontinental Gas Pipe Line Company, LLC, Garden State Expansion, Station 203 Bordentown and Chesterfield Townships, Burlington County, New Jersey. Prepared by: GAI Consultants, Inc.

GAI Project Number: C120095.13, Task 002. October 2015. Page 6.

⁹ *Id.*

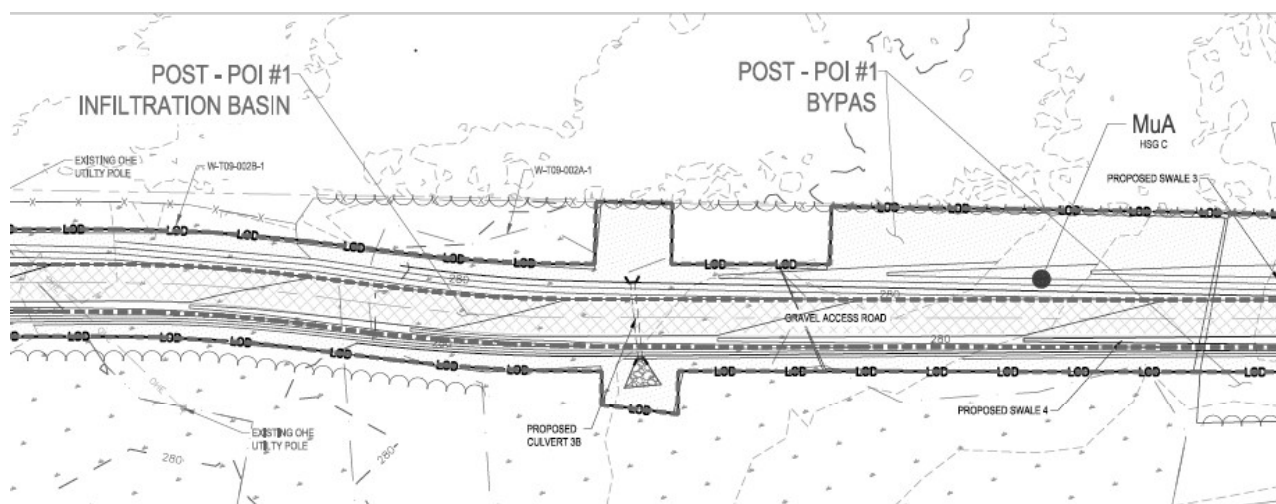
Figure 2: Reinforced Gravel Access Road (Sheet 11 of 13 of the PCSM Plans and Sheet 8 of 9 of the DEP Landuse Permit Plans)



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Thus, the gravel road will be compacted, but Transco is still underestimating the runoff. The gravel access roads are delineated by AECOM to approximately the actual edge of gravel (indicated by the red dashes in Figure 3 below) and do not include the vegetated areas associated with right of way of the gravel road. In this case, AECOM is still applying CN values for gravel road with ROW, even though no ROW is included in their drainage area figure. This provides yet another example of the applicant underestimating stormwater runoff.

Figure 3: Excerpt of the Compressor Station No. 206 Drainage Area Map (Proposed Conditions) Sheet 4 of 10



Failure to accurately model the amount of runoff generated at the site will result in a basin that is too small to satisfy the various requirements of New Jersey's Stormwater Management Rules and thus fail to comply with N.J.A.C. 7:7A-10.2(b) 15.

2. Response #12 ("Infiltration and Recharge")

Transco's response indicates that "the core and underlying cut-off trench will be constructed using the on-site, predominately sandy silt material that will need to be excavated to achieve the proposed basin grades. Soil particle size is the key factor governing soil permeability. Because the cut-off trench (and overlying core) will be constructed of on-site soil material and, therefore, possess gradation (particle size) and permeability similar to the adjacent in-situ soils that will underlie the basin floor, lateral flow through the cut-off trench will not be impeded."

Although the response indicates that the embankment will rely predominately on sandy silt, sediment basin note 3 indicates that "[s]oils acceptable for embankment construction shall be limited to GC, GM, SC, SM, CL OR ML as described in ASTM D-2487 (Unified Soils Classification System)."¹⁰ This note includes soils with higher clay content, including the following: clayey sands-sand clay mixtures (SC), clayey gravels, gravel sand clay mixtures (GC) and inorganic clays of low to medium plasticity, gravelly clays,

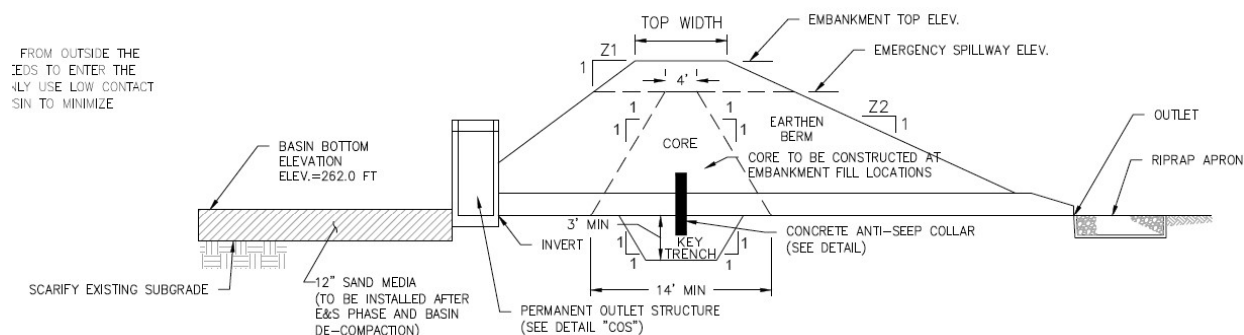
¹⁰ Transco Erosion and Sediment Control Plan

sandy clays, silty clays, and lean clays (CL). The plans clearly note that the soils used to create the embankment will rely on a wider range of soils than indicated in Transco's response to comments.

More importantly, Transco's response to comments fails to indicate that the embankment will be compacted, an activity that will restrict the lateral movement of water through the embankment. Regarding construction details provided on AECOM's plans, Transco's response bears little resemblance to what is indicated in the notes on Sheet 8 of 13 (see Attachment 4) of the Soil Erosion and Sediment Control plans -- specifically, notes 9 and 10 of the sediment basin notes, which reference (in note 10) that the "embankments should be compacted by sheepsfoot or pad roller" and that the "loose lift thickness should be 9 inches or less". Note 10 goes on to state that "five passes of the compaction equipment over the entire surface of each lift is required." In addition, note 9 states that "The foundation of the basin embankment should be stripped and grubbed to a depth of two feet prior to any placement and compaction of earthen fill." Transco's response apparently neglected to consider that its plans indicate that the embankment is to be compacted and, instead, concludes that "Because the cut-off trench (and overlying core) will be constructed of on-site soil material and, therefore, possess gradation (particle size) and permeability similar to the adjacent in-situ soils that will underlie the basin floor, lateral flow through the cut-off trench will not be impeded." The compaction detailed in Transco's signed and sealed plans are appropriate for the construction of an embankment and will substantially modify the permeability of the soils in the embankment. It is very important to note that even though the on-site soil material used to construct the embankment may possess similar particle size to that of adjacent in-situ soils, the compaction of these soils will substantially modify their permeability and will restrict the lateral movement of groundwater through the embankment. This is yet another error that impacts the proposed stormwater facilities' ability to function as required.

Transco's response to comments is inconsistent with the generalized detail for the construction of the embankment shown in Figure 4 below as well as the plan notes, specifically Note 10 provided in the Erosion and Sediment Control plan set. In order to understand exactly what is being proposed, Transco's design engineer should provide a sufficient level of construction detail to enable a reviewer to understand how the proposed embankment would be constructed. The plan detail clearly shows a core to be constructed in all locations of the embankment fill, but it does not differentiate the material or construction standards between the core and the remaining earthen berm.

Figure 4: Sediment Basin Detail (Sheet 11 of 13 of the Soil Erosion and Sediment Control Plans) and Infiltration Basin Detail (on Sheet 8 of 13 of the Post Construction Stormwater Management Plans)



The depth of the key trench is stated to be a minimum of 3 feet from the invert of the pipe. Key trenches are incorporated into embankment construction to both reduce the potential for sliding and reduce seepage from bypassing the embankment.

Although the proposed embankment is not currently classified as a dam (as per New Jersey Dam Safety Standards), it should be designed and constructed to meet the standards for new earthen embankments. State dam safety departments rely on the Federal Energy Regulatory Commission (FERC) as the basis for their individual regulations and standards. As such, Chapter 4 ("Embankment Dams") of the "Engineering Guidelines for the Evaluation of Hydropower Projects" -- published by FERC -- is used as reference for design. The design of the embankment must, at a minimum, meet the two criteria set forth below, which will, in turn, reduce the lateral flow of seepage and groundwater.

1. The current embankment does not include seepage control measures discussed in section 4-5.2 of Attachment 3 of this Report ["FERC Chapter 4 – Embankment Dams (Revised Draft Version)"].
2. The current embankment design includes a concrete anti-seep collar, which are no longer recommend (refer to the highlighted section of Attachment 3 of this Report, page 28).

Due to the lack of consistency in the responses provided by Transco relative to the details in AECOM's plans, our view is that the Project's design engineer must provide responses in a signed and sealed formal engineering response. Understanding the lateral movement of groundwater in this case is essential to understanding whether this infiltration basin will function as designed. Full compliance with the Stormwater Rules is required to satisfy N.J.A.C. 7:7A-10.2(b)15.

3. Response # 13 ("Mounding Analysis")

Transco's response regarding mounding continues to indicate its belief that, due to various reasons, the "in-situ soils that will underlie the cut-off trench will not restrict lateral groundwater flow." Yet, again, the details of the embankment provided on the Erosion

and Sediment Control plans do not support Transco's response. For example, the notes on sheet 8 of 13 (see Attachment 4) indicate that "The foundation of the embankment should be stripped and grubbed to a depth of 2 feet prior to any placement and compaction of earthen fill." The embankment construction detail notes provided on the Erosion and Sediment Control Plans were not included in Transco's documents submitted to DEP. In addition, the sediment basin details provided on sheet 11 of 13 indicate that the depth of the key trench is stated to be a minimum of 3 three feet. Based on the elevation of the compacted soils in the proposed embankment and the inclusion of an engineered key trench, the lateral flow of groundwater will, by design, be impacted by the proposed embankment and thus the model provided should be redone to reflect the absence of later flow under/through the embankment.

More importantly, it is apparent from Transco's response that the stormwater plans lack enough detail to determine whether the proposed basin can comply with New Jersey's Stormwater Management Regulations. Instead of providing a cross section that depicts exactly what will be constructed, Transco relied on a generalized cross section detail. For example, Transco's basin detail shows a key trench, but the plan provides no detail on how it is to be constructed. The cross section of the embankment provided neither reflects site conditions nor is it consistent with either the plan notes on the Erosion and Sediment Control Plans or Transco's September 2019 responses to comments. Transco's response number 12 indicates that due to the use of on-site soils "lateral flow through the cut-off trench will not be impeded." This seems counter to the general purpose of a cutoff trench, which is to reduce seepage below an embankment. In addition, the cross section of the sediment basin details provided on sheet 11 of 13 of the Soil Erosion and Sediment Control Plans and Infiltration Basin Detail on Sheet 8 of 13 of the Post Construction Stormwater Management Plans do not reflect the 2 feet of soil removal below the embankment indicated in the plan notes on page 8 of 13 (see Attachment 4) of the Erosion and Sediment Control Plans. Until such time as Transco depicts a fully engineered cross section of the proposed basin, it is not possible to fully comprehend what Transco is proposing and whether it will satisfy the requirements set forth at N.J.A.C. 7:7A-10.2(b)15.

4. Response # 17 ("Soil Erosion and Sediment Control Compliance")

Transco's response states that "the SCD requested that the basin be utilized for sediment control, and, as such, procedures were incorporated into the design to account for the construction use for sediment control and the post-construction use for stormwater management" and that "[s]pecifically, such procedures include avoidance measures to prevent compaction through utilizing low-ground pressure equipment, scarification to loosen the basin bottom, installation of 12 inches of sand media in the basin bottom, and maintenance programs, including tilling operations to maintain infiltration capacity."

According to Chapter 9.5 ("Infiltration Basins") of the New Jersey Stormwater Best Management Practices (BMP) manual, "the use of infiltration basins as sediment basins is highly discouraged; however, when unavoidable, excavation for the sediment control

basin must be 2 feet above the final design elevation of the basin bottom.”¹¹ The sediment basin detail on Sheet 11 of 13 of Transco’s Soil Erosion and Sediment Control Plans has a proposed top of sediment basin elevation of 262.0, which is equal to the infiltrative surface of the proposed BMP. Even if the additional 1 foot of over excavation to elevation 261 and replacement with sand to a final infiltration surface elevation of 262 is used as the “proposed top of infiltrative surface” the proposed basin is still not in compliance with the NJDEP Stormwater Management BMP manual.

Sincerely,
Princeton Hydro



Geoffrey M. Goll P.E.
President



Mark Gallagher
Vice President

¹¹New Jersey BMP Manual. Last revised November 2018. Chapter 9.5 Infiltration Basins. Page 5

Attachment 1

Curve Number for Gravel Parking Areas

Andres Torizzo

Subject: FW: Curve number for gravel road

From: Quan, Quan - Beltsville, MD [<mailto:quan.quan@wdc.usda.gov>]
Sent: Thursday, June 30, 2011 3:11 PM
To: Andres Torizzo
Subject: RE: Curve number for gravel road

Hey Andres,

Another recommendation from one of our Hydraulic Engineer as follow:

I looked to the RCN tables and saw where there are values for PAVED roads as well as PAVED WITH ROW. I found that I could use RCN 98 for 75% of the area combined with remaining 25% of the area assumed as OPEN SPACE- GOOD COND and with that I matched the PAVED w/ROW RCNS for each HSG class.

So using this same assumption of 25% ROW width as OPEN SPACE-GOOD COND for GRAVEL ROADS w/ROW I was able to match the values in the table by using the following RCN's for the remaining 75% of area that would be gravel covered:

HSG A, RCN- 88
HSG B, RCN- 92
HSG C, RCN- 95
HSG D, RCN- 95

I know it may not be perfect since HSG C and D results are identical but being as we're getting way up on the RCN scale anyway, not sure it is that big of a deal.

The above listed RCN's I think are the best guess values for the road surface only for gravel roads. Given that there is some infiltration potential with gravel compared to paved, I think they kind of make logical sense and aren't half bad.

Hope this information would be some helpful! Good luck!

Quan

From: Quan, Quan - Beltsville, MD
Sent: Thursday, June 30, 2011 11:02 AM
To: 'andres@watershedca.com'
Subject: Curve number for gravel road

Hi Andres,

Bill have forwarded your messaged to me regarding to a question that you had related to CNs for gravel roads. It's unfortunate that SCS didn't publish a specific value for gravel road surfaces excluding the right-of-way. Here is some of the comments from others regarding to CNs for gravel road:

I need to find the curve number for a couple of gravel parking lots. All I can find in the curve number tables of Hydrocad and TR-55 is gravel with right of way included. The numbers for that have to be lower than for just plain gravel pavement.

I am guessing close to 98 but I don't want to overdo it either.

Thanks

I'd take 98 for peak flow estimation.

If it's for a volume of runoff though, you may want to choose something little lower and this will probably give you an head ache.

It's not an exact science...

"Gravel" parking lots don't necessarily stay "gravel" for extended periods of time. A higher CN, as the forum has suggested is reasonable.

I'd think about the kind of traffic that will be on it as well. A "B" HSG sub-grade might compact to a "C" or "D" (essentially CN 98) if there is heavy construction traffic like a haul road, but might not if the lot is intended for long-term parking of small cars, or empty truck containers (closer to CN 96).

Same issue if the lot is constructed on compacted fill as oppose to natural ground.

I am also sending your question to other expert come to this subject. I will forward you and recommendation from them. Feel free to call me. Thanks.

Quan D. Quan

NRCS-West National Technology Support Center

Hydraulic Engineer

5601 Sunnyside Ave., Rm 1-2144C

Beltsville, MD 20705

Phone: 301-504-3952

Fax: 301-504-2295

Email: quan.quan@wdc.usda.gov

Attachment 2

**Communication with
NRCS National Technology Support Center**

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Curve number for gravel parking area

thread162-278935

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parking lots

gravel driveway

stone and gravel

gravel soil

DPAJR (Civil/Environmental) (OP)

12 Aug 10 14:06

I need to find the curve number for a couple of gravel parking lots. All I can find in the curve number tables of Hydrocad and TR-55 is gravel with right of way included. The numbers for that have to be lower than for just plain gravel pavement.

I am guessing close to 98 but I don't want to overdo it either.

Thanks

Replies continue below

Recommended for you

Saveway Paving

Ad SAVEWAY PAVING

Design of base plate by Roark's Formula

eng-tips.com

Leave a Lasting Impression - Discover Precast Solutions

Ad precast.org

Paver Care & Repair in Pennsylvania

Ad pavercareandrepair.

psmart (Civil)

12 Aug 10 14:58

It's unfortunate the the SCS didn't publish a specific value for gravel road surfaces excluding the right-of-way.

However, if you examine the TR-55 values for gravel road with ROW, they appear to be based on 30% gravel with CN=96 and 70% "open space" in poor condition. So 96 would be a reasonable value to use for the gravel alone.

Peter Smart
HydroCAD Software
www.hydrocad.net

SMIAH (Civil/Environmental)

12 Aug 10 14:58

I'd take 98 for peak flow estimation.
If it's for a volume of runoff though, you may want to choose something little lower and this will probably give you an head ache.
It's not an exact science...

beej67 (Civil/Environmental)

12 Aug 10 17:22

I'd go with Peter's answer.

Hydrology, Drainage Analysis, Flood Studies, and Complex Stormwater Litigation for Atlanta and the South East - <http://www.campbellcivil.com>

Ryb01 (Civil/Environmental)

13 Aug 10 05:40

"Gravel" parking lots don't necessarily stay "gravel" for extended periods of time. A higher CN, as the forum has suggested is reasonable.

Drew08 (Civil/Environmental)

13 Aug 10 07:58

I'd think about the kind of traffic that will be on it as well. A "B" HSG sub-grade might compact to a "C" or "D" (essentially CN 98) if there is heavy construction traffic like a haul road, but might not if the lot is intended for long-term parking of small cars, or empty truck containers (closer to CN 96).

Same issue if the lot is constructed on compacted fill as oppose to natural ground.

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Attachment 3

FERC Chapter 4 – Embankment Dams (Revised Draft Version)

Attachment 4

**AECOM Plan Sheet 8 of 13 Erosion and Sediment Control
Plan dated 6/15/2017 last revised 6/24/19**

<p>2. ALL SOIL EROSION AND SEDIMENTATION SHALL BE PREVENTED BY EROSION CONTROL DISTURBANCES, OR IN THEIR PROVISIONS, SHALL BE ESTABLISHED.</p> <p>3. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY BE RESEEDING, OR ESTABLISHMENT OF A TEMPORARY EROSION CONTROL EQUIVALENT MATERIAL, AT A RATE OF 100 LBS/1,000 SQUARE FEET.</p> <p>4. PERMANENT VEGETATION SHALL BE ESTABLISHED WITHIN 90 DAYS OF FINAL GRADING. MULCH WILL BE USED AT A RATE OF 5 TONS PER ACRE.</p> <p>5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE EROSION CONTROL IN NEW JERSEY.</p> <p>6. A SUB-BASE COURSE WILL BE APPLIED TO ALL AREAS OF THE IMPROVEMENTS IN ORDER TO STABILIZE THE SOIL. IF UTILITIES ARE PRESENT, THE SUB-BASE COURSE SHALL BE INSTALLED IMMEDIATELY FOLLOWING INITIAL GRADING (I.E.: STEEP SLOPES, ROADWAY EMBANKMENTS, STRAW MULCH OR A SUITABLE EROSION CONTROL STANDARD).</p> <p>8. ANY STEEP SLOPES RECEIVING RUNOFF SHALL BE INSTALLED IMMEDIATELY FOLLOWING INITIAL GRADING (I.E.: STEEP SLOPES, ROADWAY EMBANKMENTS, STRAW MULCH OR A SUITABLE EROSION CONTROL STANDARD).</p> <p>9. TRAFFIC CONTROL STANDARDS SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION DRIVEWAYS, IMMEDIATELY FOLLOWING INITIAL GRADING.</p> <p>10. AT THE TIME WHEN THE SITE PREPAREMENT IS ACCOMPLISHED, ANY SOIL THAT WILL BE LEFT EXPOSED TO CONSTRUCTION TRAFFIC, SHALL BE RESEEDING, OR ESTABLISHMENT OF A TEMPORARY EROSION CONTROL EQUIVALENT MATERIAL, AT A RATE OF 100 LBS/1,000 SQUARE FEET.</p> <p>11. IN THAT NJSA 4:24-39 ET SEQ., FURNISH ALL MATERIALS AND INSTALL ALL MEASURES REQUIRED TO REASONABLY CONTROL SOIL EROSION RESULTING FROM CONSTRUCTION OPERATIONS AND PREVENT EXCESSIVE FLOW OF SEDIMENT FROM THE CONSTRUCTION SITE.</p> <p>12. THE SITE SHALL AT ALL TIMES BE GRADED AND MAINTAINED SUCH THAT ALL STORMWATER RUNOFF IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL FACILITIES.</p> <p>13. ANY CHANGES TO THE CERTIFICATE OF SUBMISSION OF REVISED SOIL EROSION CONTROL PLANS MUST MEET ALL REQUIREMENTS OF THE CERTIFICATE OF SUBMISSION OF REVISED SOIL EROSION CONTROL PLANS.</p> <p>14. THE SOMERSET-JUNION SOIL EROSION CONTROL PLANS MUST BE STABILIZED, AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.</p>	<p>2. ALL SOIL EROSION AND SEDIMENTATION SHALL BE PREVENTED BY EROSION CONTROL DISTURBANCES, OR IN THEIR PROVISIONS, SHALL BE ESTABLISHED.</p> <p>3. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY BE RESEEDING, OR ESTABLISHMENT OF A TEMPORARY EROSION CONTROL EQUIVALENT MATERIAL, AT A RATE OF 100 LBS/1,000 SQUARE FEET.</p> <p>4. PERMANENT VEGETATION SHALL BE ESTABLISHED WITHIN 90 DAYS OF FINAL GRADING. MULCH WILL BE USED AT A RATE OF 5 TONS PER ACRE.</p> <p>5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE EROSION CONTROL IN NEW JERSEY.</p> <p>6. A SUB-BASE COURSE WILL BE APPLIED TO ALL AREAS OF THE IMPROVEMENTS IN ORDER TO STABILIZE THE SOIL. IF UTILITIES ARE PRESENT, THE SUB-BASE COURSE SHALL BE INSTALLED IMMEDIATELY FOLLOWING INITIAL GRADING (I.E.: STEEP SLOPES, ROADWAY EMBANKMENTS, STRAW MULCH OR A SUITABLE EROSION CONTROL STANDARD).</p> <p>8. ANY STEEP SLOPES RECEIVING RUNOFF SHALL BE INSTALLED IMMEDIATELY FOLLOWING INITIAL GRADING (I.E.: STEEP SLOPES, ROADWAY EMBANKMENTS, STRAW MULCH OR A SUITABLE EROSION CONTROL STANDARD).</p> <p>9. TRAFFIC CONTROL STANDARDS SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION DRIVEWAYS, IMMEDIATELY FOLLOWING INITIAL GRADING.</p> <p>10. AT THE TIME WHEN THE SITE PREPAREMENT IS ACCOMPLISHED, ANY SOIL THAT WILL BE LEFT EXPOSED TO CONSTRUCTION TRAFFIC, SHALL BE RESEEDING, OR ESTABLISHMENT OF A TEMPORARY EROSION CONTROL EQUIVALENT MATERIAL, AT A RATE OF 100 LBS/1,000 SQUARE FEET.</p> <p>11. IN THAT NJSA 4:24-39 ET SEQ., FURNISH ALL MATERIALS AND INSTALL ALL MEASURES REQUIRED TO REASONABLY CONTROL SOIL EROSION RESULTING FROM CONSTRUCTION OPERATIONS AND PREVENT EXCESSIVE FLOW OF SEDIMENT FROM THE CONSTRUCTION SITE.</p> <p>12. THE SITE SHALL AT ALL TIMES BE GRADED AND MAINTAINED SUCH THAT ALL STORMWATER RUNOFF IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL FACILITIES.</p> <p>13. ANY CHANGES TO THE CERTIFICATE OF SUBMISSION OF REVISED SOIL EROSION CONTROL PLANS MUST MEET ALL REQUIREMENTS OF THE CERTIFICATE OF SUBMISSION OF REVISED SOIL EROSION CONTROL PLANS.</p> <p>14. THE SOMERSET-JUNION SOIL EROSION CONTROL PLANS MUST BE STABILIZED, AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.</p>
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