



COMMONWEALTH OF PENNSYLVANIA
ENVIRONMENTAL HEARING BOARD

**DELAWARE RIVERKEEPER NETWORK
AND THE DELAWARE RIVERKEEPER,
MAYA VAN ROSSUM and STEVEN
GIDUMAL AND VIRTUS CAPITAL
ADVISORS, LLC**

v.

**COMMONWEALTH OF PENNSYLVANIA,
DEPARTMENT OF ENVIRONMENTAL
PROTECTION, and PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION,
Permittee**

**EHB Docket No. 2021-108-L
(Consolidated with 2021-109-L)**

Issued: August 27, 2024

ADJUDICATION

By Bernard A. Labuskes, Jr., Board Member and Judge

Synopsis

The Board denies consolidated appeals of a water obstruction and encroachment permit authorizing the demolition of an existing bridge and the construction of a new bridge. The existing bridge, which dates back to 1812, is causing environmental harm to the stream it traverses, and rehabilitating the bridge is not feasible. The new bridge will improve hydraulic conditions in the stream and be more consistent with the stream’s natural regime.

Background

This case involves two consolidated appeals, one filed by Delaware Riverkeeper Network and the Delaware Riverkeeper, Maya van Rossum (hereinafter “the Riverkeeper”), and one filed by Steven Gidumal and Virtus Capital Advisors, LLC (“Gidumal”) (referred to collectively as the “Appellants”). The Riverkeeper and Gidumal are appealing Water Obstruction and Encroachment

Judge Sarah L. Clark is recused in this matter and did not participate in the decision.



Permit No. E0901120-026 issued by the Pennsylvania Department of Environmental Protection (the “Department”) to the Pennsylvania Department of Transportation (“PennDOT”) on September 29, 2021. The permit authorizes PennDOT to remove the Headquarters Road Bridge in Tinicum Township, Bucks County, and construct a new replacement bridge. The Headquarters Road Bridge spans Tinicum Creek, an exceptional value stream, and borders property owned by Mr. Gidumal. The bridge was constructed in 1812 and has been closed to vehicles and pedestrians since 2011 because of significant deterioration and resulting safety concerns.

We previously conducted extensive supersedeas proceedings in this appeal. Both the Riverkeeper and Gidumal filed petitions for supersedeas, with the Riverkeeper’s petition being filed on the same day as its notice of appeal. During a conference call held with the parties in both appeals to discuss the supersedeas petitions, the parties asked to begin the supersedeas hearing more than three months later on March 2, 2022. Following the call, we issued an Order consolidating the two appeals at EHB Docket No. 2021-108-L. The parties then filed a joint proposed pre-hearing schedule for the supersedeas, which we adopted in an Order, that addressed responses to the petitions for supersedeas, discovery in advance of the supersedeas hearing, and the exchange of witness and exhibit lists.

The supersedeas hearing was held on four days: March 2, 3, 4, and 7, 2022. The parties agreed to brief the proceedings on the basis of expedited transcripts and filed simultaneous briefs on March 21, 2022. On April 1, 2022, we issued a 40-page Opinion and Order denying the Appellants’ petitions for supersedeas, finding that the existing bridge was causing environmental harm to Tinicum Creek and that the Appellants were unlikely to succeed on the merits of their claims that the Department acted unlawfully or unreasonably in issuing the permit for the replacement bridge. *Del. Riverkeeper Network v. DEP*, 2022 EHB 113. The merits hearing was

conducted on November 1, 2, 3, and 6, 2023. During the merits hearing, the parties stipulated to the inclusion of the record from the supersedeas hearing into the record on the merits. The Board conducted a site view with the parties on November 7, 2023.

FINDINGS OF FACT

1. Delaware Riverkeeper Network is an organization with a mission to protect and restore the Delaware River, its tributaries, and the ecosystem within the Delaware River watershed, which includes Tinicum Creek. (Transcript of Supersedeas Hearing Testimony Page No. (“S.T.”) 181-83.)

2. The Delaware Riverkeeper Network and the Delaware Riverkeeper, Maya van Rossum, (collectively “the Riverkeeper”) have advocated for the protection of Tinicum Creek for many years. (S.T. 196-203.)

3. Steven Gidumal and Virtus Capital Advisors, LLC (collectively “Gidumal”) own 47 acres of property around the bridge upstream and downstream, including a house dating to 1741, a barn, horse stables, and pastures. (S.T. 30-32; Gidumal Supersedeas Exhibit No. (“G. S. Ex.”)¹ 002.)

4. Gidumal purchased the property out of foreclosure on June 30, 2020. (S.T. 34-35, 44-45; Transcript of Merits Hearing Testimony Page No. (“M.T.”) 27; G. S. Ex. 002.)

5. A significant portion of Gidumal’s pastures are within the existing 100-year floodplain of Tinicum Creek. (S.T. 954; M.T. 103-04, 469-70; Department Exhibit No. (“DEP Ex.”)² 55.)

¹ Gidumal restyled his exhibits for the merits hearing, calling them “Tabs” and providing a table that linked the Tabs to the exhibit numbers from the supersedeas hearing. We will refer to his exhibits as they were originally numbered at the supersedeas hearing.

² The Department’s exhibits from the supersedeas hearing and the merits hearing are the same.

6. The Pennsylvania Department of Environmental Protection (“the Department”) is the agency of the Commonwealth with the duty and responsibility to administer and enforce the Dam Safety and Encroachments Act, Act of November 26, 1978, P.L. 1375, *as amended*, 32 P.S. §§ 693.1 – 693.27; The Clean Streams Law, Act of June 22, 1937, P.L. 1987, *as amended*, 35 P.S. §§ 691.1 – 691.1001; Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, *as amended*, 71 P.S. § 510- 17; and the rules and regulations promulgated thereunder.

7. The Pennsylvania Department of Transportation (“PennDOT”) is an agency of the Commonwealth that applied for a water obstruction and encroachment permit from the Department for the replacement of the Headquarters Road Bridge in Tinicum Township, Bucks County. (PennDOT Exhibit No. (“DOT Ex.”)³ 14.)

8. The Department issued Water Obstruction and Encroachment Permit No. E0901120-026 to PennDOT on September 29, 2021, authorizing the removal of the existing Headquarters Road Bridge and the construction of a replacement bridge. (DOT Ex. 14.)

9. The existing Headquarters Road Bridge was built in 1812 and has since undergone various repairs, including the replacement of the superstructure in 1919, which remains there today. (S.T. 261, 736; M.T. 594; DOT Ex. 15.)

10. The superstructure of a bridge is the portion of the bridge that carries the deck and roadway surface that sits on top of the abutments and piers of the supporting substructure. (S.T. 261, 573-74, 599-600.)

11. The Headquarters Road Bridge is part of a state highway. (M.T. 454.)

³ PennDOT’s exhibits maintained the same numbering in both the supersedeas hearing and the merits hearing, with additional exhibits for the merits hearing continuing with sequential numbering.

12. The bridge spans Tinicum Creek, an exceptional value water of the Commonwealth, at a point about five-and-a-half miles upstream of Tinicum Creek's confluence with the Delaware River. (S.T. 121, 260, 262; DOT Ex. 14.)

13. Tinicum Creek has also been designated as a Wild and Scenic River by the National Park Service. (S.T. 185-87; M.T. 116; DOT Ex. 15.)

14. The existing bridge is a contributing resource to the Ridge Valley Rural Historic District. (M.T. 489-90, 546; DOT Ex. 15.)

15. The existing bridge is approximately 78 feet long from its eastern abutment to its western abutment and it has a 16-foot-wide roadway. (S.T. 262, 571-72.)

16. The existing bridge's substructure is comprised of two masonry abutments at either end and two masonry support piers within Tinicum Creek. (S.T. 571.)

17. The existing bridge is a three-span structure, with each span being the distance between an abutment or a pier. (S.T. 571.)

18. The Headquarters Road Bridge has been closed to vehicles and pedestrians since 2011 because of safety concerns with the bridge's overall structural integrity and because of a large, four-foot-wide hole in the bridge deck discovered during an inspection. (S.T. 572-73, 728; M.T. 303, 537, 812.)

19. Efforts to cover the hole with a steel plate were unsuccessful because there was not any sound concrete in which to anchor the plate. (S.T. 573, 735-36; M.T. 538, 594.)

20. The bridge was determined to be unsafe for use by the public because of the risk of imminent failure of the bridge and its structural inability to safely carry vehicular traffic. (S.T. 573, 887.)

21. The closure of the existing bridge in 2011 has necessitated a 15.6-mile detour to be in place. (S.T. 639.)

22. Although the existing bridge is also theoretically closed to pedestrians, there has been concern of pedestrians, cyclists, and motorcycles going around the closure barriers and continuing to use the bridge, so stone was placed on the bridge to cordon off any gaps. (S.T. 664-65, 674-75.)

23. PennDOT started thinking about possibly replacing the Headquarters Road Bridge in 2002, with design for a new bridge beginning in 2005. (S.T. 611; DOT Ex. 10.)

24. Extensive discussions with, among others, the Department, the National Park Service, the U.S. Army Corps of Engineers, the Pennsylvania Historical and Museum Commission, and various consultants led PennDOT to pursue a replacement bridge consisting of two spans with shifted abutments to span the natural waterway of Tinicum Creek and align with the flow of the stream. (S.T. 611-17, 844-45, 850; DOT Ex. 10.)

25. The abutments for the replacement bridge will be shifted approximately 15 feet to the west, with the western abutment shifted out of Tinicum Creek and into the stream bank and the eastern abutment being shifted closer to the stream channel. (S.T. 280, 282, 575-76; M.T. 416-17, 457.)

26. The new bridge is essentially the same length as the existing bridge. (S.T. 280.)

27. It will have a two-lane superstructure sitting on top of reinforced concrete abutments and a single reinforced concrete pier. (S.T. 573-74; M.T. 416; DOT Ex. 9.)

28. The width of the replacement bridge will be 24 feet to match the width of the approach roadway and consist of two ten-foot travel lanes with two-foot shoulders. (S.T. 574; DOT Ex. 15.)

29. The concrete faces of the structure of the new bridge will be faced with stone salvaged from the existing bridge, to the extent that enough competent stone can be salvaged. (S.T. 574, 605, 740-41; M.T. 780-81; DEP Ex. 32; DOT Ex. 49.)

30. Although at the time of the supersedeas hearing PennDOT had selected a contractor and estimated that the new bridge would be completed in April or May 2023, the project has been delayed and there is no longer a contractor lined up for the project. (S.T. 643, 646-47, 684-85; M.T. 521-22, 568, 570-74.)

31. The existing Headquarters Road Bridge is in an advanced state of deterioration and lacks structural integrity. (S.T. 828, 921; M.T. 303-04, 311-12, 320-21, 337, 422, 425-26, 443, 484-85, 487-88; DOT Ex. 7 (at 47), 10 (at 2), 26, 28; G. S. Ex. 911, 913.)

32. As far back as 2006, every component of the structural condition of the existing bridge had evidence of deterioration, sometimes severe deterioration in certain areas. (S.T. 829; M.T. 487-88; DOT Ex. 26.)

33. In the intervening years the deterioration has only worsened. (S.T. 887.)

34. During an inspection in September 2021, following widespread flooding caused by the remnants of Hurricane Ida, PennDOT's consultant noted that the stone at the top of the western abutment supporting the superstructure is completely fractured and "a hundred percent crushed in certain areas." (S.T. 835-36; M.T. 428, 432-33; DOT Ex. 70.)

35. There is a large void or localized collapse in the eastern pier that could compromise the entire bridge structure. (S.T. 830-31; DOT Ex. 70.)

36. One of the wing walls of the bridge (an extension of the abutment going back into the approach roadway) exhibits step cracking, a sign of failure, and a section of the wing wall has fallen into the creek bed, failing along the step cracking line. (S.T. 836; DOT Ex. 70.)

37. There is a large void in the western pier close to five feet in width, two to three feet high, and a foot deep. (S.T. 836-37; DOT Ex. 70.)

38. There is evidence of the foundation of the abutments being undermined, with water getting underneath the base stones. (S.T. 842.)

39. The condition of the stone of the piers is cracked and crushed and even the high-quality stone toward the base of the pillars is completely fractured, indicating that loading is now concentrated in certain areas, which could precipitate further failure. (S.T. 829-30; M.T. 428-30, 431.)

40. During core drilling of the bridge piers, PennDOT's consultant found that some of the base stone was in fairly good condition, but other areas had large voids and more than a foot of unsupported area from material loss over time. (S.T. 834; M.T. 424-26; DOT Ex. 65.)

41. The interior of the piers and abutments of the existing bridge are composed of dry stacked stone without any mortar holding the stone together. (M.T. 335-36, 338, 386, 425-26; DOT Ex. 65.)

42. Some of the piers and abutments are filled with crushed stone or soil after decades of deterioration. (M.T. 306-08, 503; DOT Ex. 65.)

43. The lime mortar holding the masonry together is in poor condition and the grout joints in the masonry have deteriorated. (S.T. 834-35, 858; DOT Ex. 28.)

44. The superstructure of the bridge has holes in the deck, including the four-foot hole that brought about the bridge's closure, and the frame is in very poor condition. (S.T. 829; M.T. 538.)

45. Stone from the bridge is already falling into the stream and other areas of stone and stream bank are continuing to erode. (S.T. 862-63.)

46. The collapse of stone near the tops of the supports could result in the loss of support in the western span, which would likely mean the superstructure would fall into the creek. (S.T. 887.)

47. In its alternatives analysis submitted as part of the permit application, PennDOT evaluated two different options for possibly rehabilitating the existing bridge: (1) a one-lane superstructure with the replacement of the existing abutments with reinforced concrete abutments and a partial rehabilitation of the existing piers; and (2) a two-lane superstructure with the same work on the substructure. (S.T. 601; DOT Ex. 7, 64.)

48. Both options were rejected because they were not feasible due to the significant deterioration of the Headquarters Road Bridge's substructure. (S.T. 921; DOT Ex. 7, 64.)

49. No one disputes that in any rehabilitation effort the entire superstructure of the existing bridge would need to be replaced because of its deterioration. (M.T. 298-99, 342.)

50. "Rehabilitating" the existing bridge would involve reconstructing nearly the entire bridge. (M.T. 310, 312-13, 370-71, 372, 443, 445-46, 493-94, 496-97, 510.)

51. Rehabilitation of the existing bridge is not feasible because it would leave two large piers and an abutment within the stream channel that will continue to collect debris and impact water quality, it would not be able to accommodate emergency vehicles, and there is not enough stone that can be saved from the existing structure. (S.T. 921; M.T. 455-57, 550-51.)

52. The existing bridge has exceeded its intended life, poses a safety risk, and a full replacement is warranted. (S.T. 921; DOT Ex. 7 (at 47), 10 (at 2).)

53. Tincum Creek currently experiences significant erosion and scour, at some points down to bedrock on the western side near the bridge, likely brought on by the existing bridge. (S.T. 329-32, 339, 856.)

54. The existing western abutment is within the banks of Tincicum Creek. (S.T. 576, 1181, 1205; DEP Ex. 55.)

55. The water of Tincicum Creek flows directly into the wing wall of the western abutment, and the stream then bends around that abutment. (S.T. 838, 855, 861, 886-87, 942; DOT Ex. 27 (at 8), 28.)

56. The western abutment is taking the full force of the stream, which is directing energy downward and causing scour. (S.T. 1141, 1147-48, 1152, 1170-72; M.T. 460-61, 844-45.)

57. Although areas of the stream near the bridge are only a few inches deep to the stream bottom, a scour hole near the western abutment is at least five feet deep and has heavily eroded the stream bank. (S.T. 161-62, 455, 841; DOT Ex. 15.)

58. The scour has continued to get worse, (S.T. 858; DOT Ex. 28), and more scour holes are developing in the middle span of the bridge, (S.T. 953).

59. Erosion at the bridge has exposed the roots of trees in the stream banks, at least one tree has already fallen, and it is likely only a matter of time before more trees fall into the stream. (S.T. 631-32, 858-59, 863-64, 883-84; DOT Ex. 13, 28, 36.)

60. There is a significant amount of sediment deposition forming a point bar on the eastern side of the stream that has become vegetated and projects far into the watercourse. (S.T. 797, 855, 863, 938, 1142-43; DOT Ex. 9, 27 (at 8), 28.)

61. The new bridge will be better for the natural regime of the stream than if the existing bridge were to remain in place. (S.T. 1037, 1040-41; M.T. 472, 582-83, 688-90.)

62. Removing the old bridge and replacing it with the new bridge will improve the condition of the stream, and hydraulics will improve both within the stream channel and in the floodplain. (S.T. 1041, 1468-69, 1480; 690-91.)

63. The new bridge project will result in the removal of the existing wide pier within the stream, which is substantially interfering with natural flow right in the middle of the stream channel. (S.T. 1037.)

64. The new bridge will utilize a single three-and-a-half feet wide pier within the stream that will be smaller than the existing piers, which will lessen the potential for debris accumulation during flood events. (S.T. 845, 852; M.T. 432-34, 459, 582-83.)

65. By only having a single obstruction in the stream channel, the hydraulic capacity of the channel will increase by 18-20 percent. (S.T. 1040; M.T. 461, 698-91.)

66. The potential for debris accumulation, erosion, and scour are all reduced by having fewer obstructions and an increased hydraulic area. (S.T. 887-90; M.T. 582-83, 867-68.)

67. The replacement bridge will have improved and more natural free flow characteristics and conveyance capacity and less potential for the displacement of stream bed material during flood events that could create new gravel bars and downstream sediment deposits. (S.T. 167-68, 469, 846, 850, 852, 888-89; M.T. 463-64, 688-90.)

68. Installing the new bridge will reduce scour and erosion and return Tinicum Creek to a more natural free-flowing state. (S.T. 1468-72, 1479-80, 1500.)

69. PennDOT within the bridge structure proposes to angle rip rap up along the sides of the western abutment and western stream bank to absorb the flow energy coming into the area exposed by the western abutment shift, slow down water velocity, prevent bank erosion, protect the riparian buffer, and direct water toward the center of the channel, which will help improve downstream conditions. (S.T. 850-51, 865-66, 868, 1468; M.T. 462; DOT Ex. 29.)

70. Approximately 15-20 feet of the western bank downstream of the bridge will be armored with rip rap. (M.T. 511, 882-83.)

71. The rip rap will be depressed into the bank two feet deep, backfilled with stream bed material, and covered with soil. (M.T. 578-80, 919-20, 932; DOT Ex. 30.)

72. The rip rap will be able to withstand water velocities greater than 10 feet per second and will protect against erosion. (M.T. 697-98.)

73. The new bridge will not result in significant erosion of the stream channel and the western bank near the bridge. (M.T. 462, 471-72, 663, 684.)

74. At some places along the bank, soil cover is only six inches deep before encountering bedrock. (M.T. 513-15; DOT Ex. 30a.)

75. Gidumal experiences significant flooding of his property in its current condition with the existing bridge in place. (M.T. 81; G. S. Ex. 601, 610.)

76. The new bridge will not increase the risk of flooding or the damage caused by inevitable flooding within the area around the bridge. (S.T. 1461, 1472, 1473, 1480, 1493; M.T. 643, 661, 732-35, 738-41.)

77. There will be no significant increase in stream velocities, even in the area along the downstream western bank. (S.T. 992-97, 1001-14, 1035-36, 1037, 1040-41; M.T. 646-49, 654-56, 660; DOT Ex. 38, 39, 57.)

78. The permit requires PennDOT to conduct a pre-construction assessment of the project area and monitor conditions for five years after the project is completed. (M.T. 573, 862-63, 873; DEP Ex. 39; DOT Ex. 14.)

79. PennDOT used a one-dimensional (“1D”) model in its permit application for its hydrologic and hydraulic (H&H) analysis after consulting with an outside firm on whether its 1D analysis was appropriate for this project as opposed to a two-dimensional (“2D”) analysis. (S.T. 853-54; DOT Ex. 27.)

80. PennDOT's 1D analysis showed no real appreciable increase in flow velocity from what is happening now in Tinicum Creek. (S.T. 879-80, 890-91; DOT Ex. 32, 33.)

81. During the course of this appeal, PennDOT engaged an expert to perform 2D modeling, which confirmed the conclusion of the 1D modeling that the bridge replacement would overall slightly reduce flow velocity, or at most result in a negligible increase at some points during some storm events. (M.T. 660; DOT Ex. 38, 39.)

82. Given the relatively straight section of Tinicum Creek where the Headquarters Road Bridge is located, and the relatively small bridge, a 2D study was not necessary for the project. (S.T. 982-83, 1090-91, 1103-04; M.T. 649-50.)

83. The new bridge comports with modern safety standards for motorists, improving site distances and the ability to see oncoming traffic as a driver approaches the bridge. (S.T. 881-82; DOT Ex. 34.)

84. PennDOT entered into a Memorandum of Agreement with the Federal Highway Administration, the Pennsylvania State Historic Preservation Officer, and the Advisory Council on Historic Preservation to ensure that the project's impacts to the historic resources of the area were mitigated to the greatest extent possible. (DOT Ex. 49.)

85. The Memorandum of Agreement also established a nine-member Design Advisory Committee consisting of people from the National Park Service, the Advisory Council on Historic Preservation, the Pennsylvania State Historic Preservation Office, Bucks County officials, and Tinicum Township supervisors, who would be involved during project development and also engaged towards the beginning of the construction process. (DOT Ex. 49.)

86. One of the permit's special conditions requires PennDOT to abide by the Memorandum of Agreement. (DOT Ex. 14 (at 4).)

87. One of the conditions of the permit provides that it does not grant any property rights:

This permit does not give any property rights, either in real estate or material, nor any exclusive privileges, nor shall it be construed to grant or confer any right, title, easement, or interest in, to, or over any land belonging to the Commonwealth of Pennsylvania; neither does it authorize any injury to private property or invasion of private rights, nor any infringement of Federal, State, or Local laws or regulations; nor does it obviate the necessity of obtaining Federal assent when necessary.

(DOT Ex. 14.)

DISCUSSION

At the outset we must emphasize that very little has changed in this case since we issued our Opinion and Order denying the Appellants' petitions for supersedeas in April 2022. The parties' arguments in their post-hearing briefs on the merits are essentially the same as their arguments in their post-hearing briefs on the supersedeas. The Appellants still argue that the new bridge will cause an increase in water velocities near the bridge that will result in too much erosion in the stream and that will worsen flooding on Mr. Gidumal's property. They still say that the Department did not appropriately consider the existing bridge as a valuable historic resource that should be preserved and rehabilitated instead of replaced. They argue that the Department failed in its duties as a trustee under Article I, Section 27 of the Pennsylvania Constitution to conserve and maintain the existing bridge. Mr. Gidumal continues to claim that certain disputes over temporary easements and rights-of-way on his property should have prevented the Department from ever issuing the permit to PennDOT. None of these arguments were successful at the supersedeas stage.

An additional problem for the Appellants is that, from an evidentiary perspective, this case is basically the same as it was after the supersedeas hearing. Gidumal's hydraulics and hydrology expert, Dr. Clay Emerson, did not testify at the merits hearing. This is somewhat surprising given

that Dr. Emerson, at the time of the supersedeas hearing, testified that he did not review the two-dimensional (“2D”) model of PennDOT’s hydraulics expert, Benjamin Israel-Devadason, P.E. (S.T. 140-41.) Accordingly, Gidumal presented no expert testimony at either hearing to directly contest PennDOT’s expert’s 2D modeling.

Among the witnesses who did testify at the merits hearing, much of it covered the same ground in the same ways as during the supersedeas hearing. The Riverkeeper’s hydraulics expert, Mary Paist-Goldman, used her testimony at the merits hearing largely as an attempt to rebut our findings from our supersedeas Opinion, but she did not conduct any new analysis, update her previous analysis, or rerun her model in advance of the merits hearing. (M.T. 247, 260.) To the extent there was new testimony, it tended to only bolster our findings from the supersedeas hearing. For instance, while Mr. Israel-Devadason did not conduct any new study, he did review Dr. Emerson’s model, which he did not have access to at the time of the supersedeas hearing, and he did take a closer look at the 2D model of Ms. Paist-Goldman following the supersedeas hearing, finding fault in each of their models. The only witness to testify at the merits hearing who did not testify during the four-day supersedeas hearing was Douglas Bond, P.E., who the Riverkeeper called to address the prospect of rehabilitating the existing bridge instead of demolishing and replacing it.

During the merits hearing, the parties stipulated to the inclusion of the entire record from the supersedeas hearing into the record on the merits. (M.T. 128, 283.) Perhaps this is not entirely surprising since, although it was nominally a supersedeas hearing, in reality the supersedeas hearing was closer to an expedited hearing on the merits. The supersedeas hearing was conducted more than three and a half months after the appeals were filed, with discovery conducted among the parties pursuant to a joint case management order proposed by the parties and accepted by the

Board. It is actually somewhat unusual for an appeal to continue to the merits stage after supersedeas proceedings, especially when supersedeas proceedings function more as an expedited merits hearing as they did here.

Although a ruling on a petition for supersedeas is typically just a prediction about which party is likely to eventually prevail on the merits, *UMCO Energy, Inc. v. DEP*, 2004 EHB 832, 839-40, nothing since the supersedeas has caused us to change our view of the case or alter the conclusions we made at the supersedeas stage. We have kept an open mind during the remainder of the proceedings and at the merits hearing, but the Appellants have not presented any evidence to change the conclusion we reached after the supersedeas hearing: that the existing bridge is causing environmental harm to Tinicum Creek and its natural regime and the Appellants have not shown that the permit for the replacement bridge is unlawful or unreasonable in any way.

As third parties appealing a Department permitting decision, the Appellants bear the burden of proof in this appeal. 25 Pa. Code § 1021.122(c)(2). The Appellants must show by a preponderance of the evidence that the Department acted unreasonably, contrary to the law, that its decision to issue the permit is not supported by the facts, or that its actions are inconsistent with the Department's obligations under the Pennsylvania Constitution. *Reed v. DEP*, EHB Docket No. 2022-095-B, slip op. at 10 (Adjudication, June 25, 2024) (citing *Center for Coalfield Justice v. DEP*, 2017 EHB 799, 822; *Brockway Borough Mun. Auth. v. DEP*, 2015 EHB 221, 236, *aff'd*, 131 A.3d 578 (Pa. Cmwlth. 2016); *Solebury School v. DEP*, 2014 EHB 482, 519; *Gadinski v. DEP*, 2013 EHB 246, 269). For the reasons explained below and for largely the same reasons as we explained in our Opinion and Order on the supersedeas petitions, the Appellants have not met their burden.

Rehabilitating the Existing Bridge

Beginning with the only substantially new ground covered at the merits hearing, the Riverkeeper largely hangs its hat on the prospect of what they call rehabilitating the existing Headquarters Road Bridge instead of demolishing it and building a new one as proposed by PennDOT and permitted by the Department.⁴ The Riverkeeper contends that rehabilitating the existing bridge is necessary to preserve the historic values of the bridge and the surrounding Ridge Valley Rural Historic District.

Under the regulations, a permit applicant must include in its application an alternatives analysis, which consists of “[a] detailed analysis of alternatives to the proposed action, including alternative locations, routings or designs to avoid or minimize adverse environmental impacts.” 25 Pa. Code § 105.13(e)(1)(viii). *See also* 25 Pa. Code § 105.14(b)(7) (project’s water dependency “must be based on the demonstrated unavailability of any alternative location, route or design and the use of location, route or design to avoid or minimize the adverse impact of the dam, water obstruction or encroachment upon the environment and protect the public natural resources of this Commonwealth”). The Riverkeeper believes that rehabilitating the existing bridge is the alternative that should have won out over PennDOT’s chosen project of replacing the bridge.

The Riverkeeper repeatedly accuses PennDOT of failing to evaluate rehabilitation as an option as part of its alternatives analysis submitted with the permit application, or somehow

⁴ The Department argues that the Appellants have waived the ability to argue for rehabilitation because they did not include a challenge to the alternatives analysis in their notices of appeal. *See Morrison v. DEP*, 2021 EHB 211, 219 (issues not raised in a notice of appeal are generally waived). We find that the Appellants have done enough to raise this issue in general terms in their notices of appeal to avoid waiver. *See Benner Twp. Water Auth. v. DEP*, 2019 EHB 594, 637 (“notices of appeal are to be read broadly and we will be reluctant to find waiver so long as an objection falls within the ‘genre of the issue’ contained in the notice of appeal”). The Appellants’ entire appeals contest the demolition of the existing bridge and its chosen replacement. If the Appellants do not want the existing bridge to be demolished then there is little else left than an attempted rehabilitation.

stacking the deck against rehabilitation in the analysis, but that is just factually untrue. PennDOT's alternatives analysis included six options in addition to a "no build" alternative, and two of the six alternatives were rehabilitation options. (DOT Ex. 64.) The first rehabilitation option was a one-lane superstructure with the replacement of the existing abutments with reinforced concrete abutments and a partial rehabilitation of the existing piers. (S.T. 601.) The second was a two-lane superstructure with the same work on the substructure. Rehabilitating the bridge was dismissed by PennDOT in the alternatives analysis for the project because it was determined that rehabilitation was not feasible and it did not satisfy the overall project purpose. (M.T. 455-56; DOT Ex. 7, 64 (at 7-13).) Rehabilitation would have left two piers within the stream that would impact its free-flowing nature, continue to cause debris accumulation, and continue to cause scouring at the piers and abutments and negatively impact water quality. (DOT Ex. 64 (at 12, 16).) Rehabilitation was also rejected because of the structural deficiency of the existing bridge, and rehabilitation would not accommodate two lanes of traffic, would not be able to support the weight of heavier emergency vehicles, and would not accommodate the turning radius requirements for emergency vehicles. (M.T. 456-57.) PennDOT's contracted engineering firm actually reviewed an earlier rehabilitation proposal by Douglas Bond, P.E., the Riverkeeper's expert who specializes in rehabilitating historic bridges, when PennDOT was preparing the alternatives analysis for the project. (M.T. 436.)

Mr. Bond's current rehabilitation proposal as presented at the merits hearing is basically that a new, one-lane bridge deck can be placed on rehabilitated piers and abutments. It would have to remain a one-lane bridge because, in Mr. Bond's opinion, a two-lane bridge would require significant strengthening and reinforcement of the piers and abutments to support the additional width. (M.T. 333-34, 342.) PennDOT's position, as articulated by Michael McAtee, P.E.,

PennDOT’s engineering project manager and expert on this issue, is that the existing bridge would require complete reconstruction because of its structural deterioration and that this is simply not a feasible option

Weighing competing expert testimony is one of the Board’s core functions. *Gerhart v. DEP*, 2019 EHB 534, 558. *See also DEP v. EQT*, 2017 EHB 439, 497, *aff’d*, 193 A.3d 1137 (Pa. Cmwlth. 2018). The weight given an expert’s opinion depends upon factors such as the expert’s qualifications, presentation and demeanor, preparation, knowledge of the field in general and the facts and circumstances of the case in particular, and the quality of the expert’s data and other sources. *Crum Creek Neighbors v. DEP*, 2009 EHB 548, 561. “We also look to the opinion itself to assess the extent to which it is coherent, cohesive, objective, persuasive, and well grounded in the relevant facts of the case.” *EQT*, 2017 EHB at 497. “Resolution of evidentiary conflict, witness credibility, and evidentiary weight are matters committed to the discretion of the Board.” *EQT Prod. Co. v. Dep’t of Env’tl. Prot.*, 193 A.3d 1137, 1149 (Pa. Cmwlth. 2018) (citing *Kiskadden v. Dep’t of Env’tl. Prot.*, 149 A.3d 380, 387 (Pa. Cmwlth. 2016)).

To the extent we must weigh the opinions of Mr. Bond against Mr. McAtee, we credit the testimony of Mr. McAtee. Mr. McAtee is among the experts most tenured with this project. He has worked on the project for more than 18 years, with 17 of those being the engineering project manager. (M.T. 413, 492.) He has been to the site more than 30 times and overseen structural investigations of the existing bridge. (M.T. 413, 424-25; DOT Ex. 65.) We also found his testimony to be honest, sincere, and straightforward. His opinions are supported by all of the credible evidence in this case that shows that rehabilitation of the existing bridge is not feasible.

What Mr. Bond calls “rehabilitating” the bridge is a bit of a misnomer. Instead, what he calls rehabilitation is more like a significant reconstruction. First, all parties agree that the bridge’s

1919-era deck and superstructure that carry the roadway would need to be completely replaced, so there is already a significant portion of the bridge that cannot be rehabilitated in the normal sense of the word. Mr. Bond testified that the bridge deck is completely deteriorated and there is “no question” that the bridge deck needs to be replaced. (M.T. 298-99, 342.) Beyond the bridge deck, under Mr. Bond’s proposal, the top two feet of masonry on the piers and abutments would need to be removed and replaced with a two-foot thick concrete cap to more evenly distribute the load of the deck over the stone. (M.T. 310, 312-13.) Mr. Bond acknowledged that a 12-foot by 7-foot bulge in the west pier would need to be taken down and rebuilt, approximately 45-50% of the pier. (M.T. 370-71.) Significant defects in the east pier would need to be reconstructed, including a 3-foot by 5-foot outward bulge in the stone. (M.T. 372.) The west abutment has a 3-foot by 4-foot stone that would need to be completely replaced. (M.T. 374.)

Mr. McAtee thinks even more of the piers and abutments would need to be entirely reconstructed. For instance, in Mr. McAtee’s view, the west abutment would need to be entirely reconstructed for Mr. Bond’s proposal, or at least have the base incased in concrete if those stones were to remain. (M.T. 445-46.) Mr. McAtee agreed that there is a 12-foot by 7-foot bulge in the west pier, but instead opined that the entire pier would need to be taken apart and rebuilt, a process he (more accurately in our view) labeled reconstruction. (M.T. 443.) Mr. McAtee also opined that the wingwalls would need to be replaced and splayed out in Bond’s proposal. (M.T. 496-97.)

We credit Mr. McAtee that nearly the entire bridge would need to be rebuilt stone by stone under the so-called rehabilitation proposal. As Mr. Bond recognizes, some of the stones that make up the crucial support structure are very damaged, to the point that they have “fallen apart” and would need to be replaced. (M.T. 303-04, 311-12, 320-21, 337.) Some of the piers and abutments are severely deteriorated. Indeed, the interior of the piers and abutments, one of the primary load-

bearing features of the bridge, is composed of dry-stacked stone—just stones piled on top of each other without any mortar or grout holding them together. (M.T. 335-36, 338, 386, 425-26.) We credit Mr. McAtee who opined that dry-stacked stone has a greater chance of being displaced, which could cause bulging or uneven load distribution, which could cause stones to fracture or crack and cause further displacement. (M.T. 426-27.) Mr. Bond accompanied PennDOT on a core drilling investigation, drilling into the piers to assess their composition, and the internal parts of the piers were severely deteriorated with the insides of some being made up of *soil* instead of rock. (M.T. 306-07.) Mr. McAtee, who oversaw the study, discovered that the stone face was only 4-6 inches deep followed by a 20-inch void within one of the piers. (M.T. 424-25.) In other words, the interior of the piers and abutments does not contain any competent stone that has any load-bearing properties.

We credit Mr. McAtee’s opinion that rehabilitation is not feasible due to the significant deterioration of the Headquarters Road Bridge’s substructure. (S.T. 921.) He credibly opined that the bridge has exceeded its intended life, poses a safety risk, and a full replacement of the bridge is warranted. Simply put, the existing bridge is too far gone for any “rehabilitation” to make sense. As Mr. McAtee put it rather succinctly, if a structure has deteriorated to a point that it needs to be entirely reconstructed to such an extent that it is not the original structure anymore, it might not be feasible and prudent. (M.T. 484-85.) Mr. McAtee said his firm looked at the amount of reconstruction that would be required and the decision was made that there would not be enough of the original structure remaining after the needed reconstruction was undertaken to justify it remaining in place because it would not be the original bridge anymore. (M.T. 493.) (*See also* DOT Ex. 7 (at 47) (“The presence of significant structural deficiencies (base sliding, bulging, cracked stone courses) indicates internal distress within the substructures and overstress of the

stone courses. The displacement of stone courses and cracking of stones introduces new voids, allowing for water to infiltrate into the pier section further advancing deterioration as a result of freeze-thaw cycles. Without entire reconstruction of the substructure, it is not possible to determine the exact service life due to the condition and continued deterioration.”), DOT Ex. 10 (at 2) (“Urban [Engineers] performed a detailed evaluation of the structure to evaluate the feasibility of its rehabilitation as part of the alternative analysis and found that the masonry structure has experienced significant distortion and localized failure which would be nearly impossible to remedy.”.) Even as far back as 2006 when PennDOT first considered the possibility of rehabilitating the bridge, PennDOT rejected that possibility because it thought the bridge was too deteriorated. (M.T. 487-88.) The condition of the bridge has only worsened in the intervening years.

With all of the reconstruction required under the Riverkeeper’s proposal, we are left wondering what of the original bridge would be left. Sailing on a Ship of Theseus, the Riverkeeper appears to concede in its reply brief that the rehabilitated bridge would not so much preserve the existing structure as be a “replica” of the old bridge. (*See* DRN Reply Brief at 10-11 (“There is nothing unlawful about replacing a component that has failed with a ‘replica’ and doing so does not rob the 1812 bridge of its historic integrity, nor does that practice adversely impact the historic, scenic and esthetic values of the Ridge Valley Historic District....”) (footnote omitted).) What the Riverkeeper really seems to want under the guise of “rehabilitation” is a one-lane bridge that has abutments and piers in the same locations as they are now, regardless of how much of the original structure or its stone can be salvaged.

The rehabilitated bridge, as proposed by Mr. Bond, would also have operational limitations that are not an issue with PennDOT’s proposed bridge. For instance, Mr. Bond testified that his

rehabilitated bridge would need to be weight restricted if the support structure was not reinforced, only supporting vehicles weighing at most 36,000 pounds. (M.T. 345-46, 452, 480.) This means the rehabilitated bridge would not be able to carry one of the local fire trucks, and it would be unlikely to support a school bus full of passengers. (M.T. 342-43, 345; 453; DOT Ex. 69.) Mr. Bond opined that the rehabilitated bridge might be able to support a pumper truck—a smaller fire truck—but the bridge may still need to be strengthened to support even that vehicle. (M.T. 381-82.) PennDOT’s replacement bridge, by contrast, was designed to handle the Ottsville Fire Department’s largest vehicle, weighing approximately 70,000 lbs. (M.T. 454.)

The rehabilitated bridge would also be unlikely support the turning radius needed for emergency vehicles. Although Mr. Bond testified that the turning radius for school buses and emergency vehicles could be achieved through some modifications to wingwalls and taking away some of the east bank, he also testified that it was not unusual for historic bridges to be unable to accommodate the turning radius needed for modern emergency vehicles and that one may need to compromise on things like turning radius and site distance in order to preserve the historic structure. (M.T. 321-23, 327, 338.) Considering the operational limitations of the rehabilitated bridge, and the questionable feasibility of reconstructing the bridge, PennDOT and the Department appropriately rejected rehabilitation as an option for this project.⁵

Even if the so-called rehabilitation were feasible from a structural and operational perspective, that does not necessarily mean that the permit under appeal for a new bridge is unreasonable, contrary to law, or inconsistent with the Department’s responsibilities under the

⁵ The U.S. District Court previously upheld the rejection of the rehabilitation option for the Headquarters Road Bridge. Although the Court was conducting a different review, it is worth noting that the Court found that PennDOT did not act arbitrarily or capriciously in determining that the rehabilitation alternatives were not prudent under Section 4(f) of the United States Department of Transportation Act of 1966 requiring the use of historic sites to be avoided or minimized. *Del. Riverkeeper Network v. Pa. Dep’t of Transp.*, No. 18-4508, 2020 U.S. Dist. LEXIS 154233 (E.D. Pa. Aug. 20, 2020). (DOT Ex. 8 (at 67-73).)

Pennsylvania Constitution. We do not believe that it is necessarily the Department's role to be dictating to a permit applicant the design for a bridge, or whether a bridge should be rehabilitated or replaced. As the Department's aquatic biologist and environmental reviewer of the permit, Christian Vlot, appropriately testified, the design and engineering choices for a bridge are not what the Department is focused on in its review. Instead, the Department is focused, particularly in the alternatives analysis, on minimizing and avoiding impacts to natural resources. Only if a permit applicant's design choices increase environmental impacts will the Department consider the design and engineering aspects of a project. (M.T. 108, 118-19.) In other words, the Department may care whether someone proposes a two-span or three-span bridge since the regulations require limiting the number of obstructions in a watercourse, 25 Pa. Code § 105.163(a), but the Department does not care whether a bridge is concrete or stone or whether it is brown or blue.

To that end, there does not appear to be any sound environmental justification for the rehabilitation option. As explained below, the existing bridge is causing environmental harm to the natural regime of Tincum Creek. Rehabilitating/reconstructing the existing bridge would merely perpetuate that harm.

Environmental Degradation from the Existing Bridge

The existing bridge is causing significant adverse environmental impacts to Tincum Creek. The bridge is interfering with the natural regime of the stream, and it is causing excess erosion and sedimentation (E&S) of the stream and excessive scour. With respect to the bridge's infringement of the stream's natural regime, there can be no question that the goal of the Dam Safety and Encroachments Act, 32 P.S. §§ 693.1 – 693.27, and the operative regulations is to preserve and protect the natural regime of watercourses. Indeed, the Dam Safety and Encroachments Act says exactly that, with one of its stated purposes being to “[p]rotect the natural

resources, environmental rights and values secured by the Pennsylvania Constitution and conserve the water quality, natural regime and carrying capacity of watercourses.” 32 P.S. § 693.2(3). The regulations echo this point:

The purposes of this chapter are to:

....

(4) Protect the natural resources, environmental rights and values secured by PA. CONST. art. I, § 27 and conserve and protect the water quality, natural regime and carrying capacity of watercourses.

25 Pa. Code § 105.2(4). Other examples in the regulations include Section 105.16(d), which provides: “In reviewing permit applications, it will be the policy of the Department to encourage activities that protect the natural condition of the watercourses or other body of water.” 25 Pa. Code § 105.16(d). Section 105.161(a)(3) then provides that:

(a) Bridges and culverts shall be designed and constructed in accordance with the following criteria:

....

(3) The structure may not materially alter the natural regimen of the stream.

25 Pa. Code § 105.161(a)(3).⁶

The Department reasonably interprets the “natural regime” of the stream to mean its equilibrium state, a stable state without excessive erosive force. (S.T. 1275, 1298.) It is a kind of neutral energy state. (*Id.*) It is not about how the stream looked 10 years ago or 100 years ago or 200 years ago. (S.T. 1274-76.) There is no particular time in history that necessarily represents what the stream would look like in its natural state. (S.T. 1335.) It is a state of what the stream would be like without any human intervention or man-made obstructions. (M.T. 828.)

Much attention has been devoted to comparing the environmental impact of the existing bridge with the environmental impact of the new bridge. We have searched the regulations in vain

⁶ The Dam Safety and Encroachments Act and the regulations use the terms “regime,” “regimen,” and “condition” interchangeably, but we do not detect any difference in the meaning of the terms.

for any indication that this is the pertinent inquiry. The pertinent inquiry centers on the project as a whole's impact on the stream and its natural regime, not the bridge's impact on an unnatural regime being artificially perpetuated by previously installed man-made obstructions. The Commonwealth is crammed with old dams, millraces, bridges, and other obstructions that have outlived their usefulness and may even be causing environmental harm. When these features are removed or replaced, the goal is to return the impacted watercourse to natural conditions to the extent possible. 25 Pa. Code §§ 105.2(4), 105.16(d), 105.161(a)(3). The goal is *not* to merely install a new obstruction that may be slightly less unsafe or may be slightly less environmentally harmful than the obstruction being replaced.

The standard in this case is not which obstruction is worse, the old bridge or the new bridge. The question that must be answered is whether removing the old bridge and installing the new bridge will materially alter the natural regime of the stream (in addition to the other relevant regulatory criteria).⁷ What constitutes the natural regime of the stream is a matter that the experts can help us define, and here, the preponderance of the testimony is that the existing bridge is interfering with the natural regime of the stream, and the replacement project will ensure that the stream is restored to a more natural free-flowing condition. We reject the unsupported legal argument that it is not necessary to strive to return a stream to a natural free-flowing condition simply because an existing obstruction has been there a long time.⁸

Tinicum Creek currently experiences significant erosion, at some points down to bedrock on the western side near the bridge. This is perhaps nowhere as evident as in the scour hole at the

⁷ To the extent that we are wrong and comparing the two bridges is the appropriate standard, the stream with the new bridge will be better than the stream with the old bridge.

⁸ Indeed, if the Department determines that an existing obstruction or encroachment is unsafe or adversely affecting property or the environment, the regulations authorize the Department to require the owner to repair or remove the offending obstruction. 25 Pa. Code § 105.62(a).

western abutment. The water of Tincum Creek flows directly into the wing wall of the western abutment, and the stream then bends around that abutment. We credit the testimony of Christian Vlot that the western abutment is taking the full force of the stream, which is directing energy downward and causing the scour. (S.T. 1141, 1147-48, 1152, 1170-72.) There are areas near the bridge where the depth of water is only a few inches deep to the stream bottom, yet the scour hole near the western abutment is at least five feet deep and has heavily eroded the stream bank. The Riverkeeper's hydrology expert, Mary Paist-Goldman, conceded that the scour hole could be as much as six or seven feet deep. (S.T. 455.) Gidumal's expert, Dr. Clay Emerson, acknowledged that the scour hole is deep and has likely eroded down to bedrock. (S.T. 161-62.) The scour has continued to get worse, and more scour holes are developing in the middle span of the bridge.

Ms. Paist-Goldman all but conceded that the existing bridge was having a negative impact on Tincum Creek when she testified at the supersedeas hearing that she did not believe the same scouring would occur if the bridge had never been built. (S.T. 329-32, 339.) We do not credit her suggestion that the scour may simply be due to poor maintenance of the existing bridge structure, (S.T. 489, 516-17; M.T. 157-58, 176, 193-94), which nevertheless implicitly concedes that the structure is having an adverse impact on the stream.

In addition to the scour, erosion at the bridge has exposed the roots of trees in the banks, at least one tree has already fallen, and it is likely only a matter of time before more trees fall into the stream and create downstream obstructions. There is a significant amount of sediment deposition forming a point bar on the eastern side of the stream that has become vegetated and projects far into the watercourse, nearly obstructing the eastern span of the bridge.

The existing bridge is a man-made obstruction that is not part of the stream's natural condition. Gidumal's expert acknowledged that the bridge is an unnatural alteration of Tincum

Creek's natural regime. (S.T. 150-52.) The stream is not flowing freely. (S.T. 149-55.) The Riverkeeper's expert similarly acknowledged that the western abutment cannot be considered part of the stream's natural regime. (S.T. 304.) It is also clear that the existing bridge is preventing Tincum Creek from reaching its equilibrium state, i.e. its natural condition, largely because of the western abutment protruding directly into the stream channel. Rehabilitating/reconstructing the old bridge or otherwise leaving it in its current injurious location or perpetuating the problem by installing a new bridge in the same impeding location would not be consistent with the natural condition of the stream.

The western abutment that is sitting in Tincum Creek is creating a shadow effect for a short distance on the western bank downstream of the bridge, meaning its projection into the stream channel is artificially protecting the western bank from the natural erosion it would otherwise experience in its unaltered state.⁹ This is the area where the Appellants have expressed their greatest concern about potential erosion. The shadow effect is not natural; it is caused by the man-made structure that is the existing bridge. It is preventing Tincum Creek from reestablishing a natural condition.

Much of the dispute in this appeal focuses on the extent to which removing the old bridge will adversely affect the western shoreline below where the existing western abutment currently is located, and whether that will result in excess sedimentation of the stream or will increase water velocity or direct flow in a manner which results in erosion of stream beds and banks over and above what occurs when the stream is flowing in accordance with its natural regime. 25 Pa. Code § 105.161(a)(3) and (4). There might be some effect; the question is how much. This turns on an analysis of the hydraulics and hydrology (H&H) of Tincum Creek.

⁹ We do not find the Riverkeeper's expert's contention that the effect extends for several hundred to 1,000 feet to be credible.

Several highly qualified experts provided their opinions in this case regarding hydrology and hydraulics, with the Appellants' experts opining that the bridge will increase excess sedimentation from erosion in the stream and the agencies' experts saying the exact opposite. For the most part, these experts have utilized various H&H models and we heard an abundance of testimony at both the supersedeas and merits hearings on model results. However, as we stated in *New Hanover Twp. v. DEP*, 2020 EHB 124, 179, *rev'd*, 258 A.3d 572 (Pa. Cmwlth. 2021), *vacated and remanded*, 286 A.3d 713 (Pa. 2022), *aff'd*, 316 A.3d 668 (Pa. Cmwlth. 2024), the importance of modeling should not be exaggerated. "Modeling is obviously a valuable tool, but as a computer-generated prediction based on many input decisions, there is plenty of opportunity for manipulation designed to achieve a desired result. Proper calibration of the model with actual field measurements...operates as a check on manipulation, but it cannot eliminate the possibility for mischief entirely." 2020 EHB at 179. Despite the use of sophisticated modeling, we must leave room for some common sense in the analysis. *Id.* at 182. *See also Solebury School v. DEP*, 2014 EHB 482 (model results not credited because model predicted wildly crenellated contour lines and lines that depicted "crazy flow paths" of groundwater); *M & M Stone Co. v. DEP*, 2008 EHB 24, *aff'd*, No. 383 C.D. 2008 (Pa. Cmwlth. Oct. 17, 2008) (model results rejected because they did not calibrate well with field results). As PennDOT's 2D modeling expert, Benjamin Israel-Devadason, cogently testified, a model is a good tool, but a modeler needs to constantly ask whether the model's results can happen in reality. (M.T. 722.)

Along those lines, we tend to agree with the testimony of Dr. Emerson at the supersedeas hearing that one does not need a "fancy model" to predict how removing the old bridge will affect flow. (S.T. 141-42.) We did not necessarily need a modeling expert to tell us that moving the western abutment out of the stream channel where it is now will eliminate the unnatural shadow

effect it has been having on the western bank downstream of the current bridge. We credit the testimony of Christian Vlot that, based on his valuable and extensive real world experience in evaluating encroachments (as opposed to computer simulations), the removal of the western abutment is not going to result in any significant increased erosion of the downstream western bank over and above what would occur in the stream's natural condition. (S.T. 1323.)

Of course, modeling is helpful, especially where, as here, it confirms predictions based on real world experience. Although we do not doubt the sincerity of all of the experts and we appreciate their contributions, we find the opinions of Mr. Israel-Devadason, both at the supersedeas hearing and the merits hearing, to be by far the most credible. Without intending to minimize the excellent qualifications of the other experts, we find Mr. Israel-Devadason to be exceptionally well qualified and by far the most knowledgeable and experienced expert. He is recognized as a national authority on the precise issues that are the subject of our inquiries in this case. (S.T. 971-80, 1041; M.T. 628; DOT Ex. 37.) He has conducted more than 500 2D H&H analyses, as compared to the Riverkeeper's expert's ten. (S.T. 974-76; M.T. 140, 622.) Mr. Israel-Devadason is a Professional Engineer and a Certified Floodplain Manager and a recognized and award-winning expert in hydraulic and hydrologic engineering, including H&H modeling.

Mr. Israel-Devadason brought his outstanding qualifications to bear in presenting clear, well-organized opinions based on extensive preparation and state-of-the-art tools. We found his opinions to be coherent, cohesive, objective, persuasive, and well grounded in the relevant facts of the case. We detected no tendency toward exaggeration, alarmism, or result-oriented conclusions in his presentation. And having viewed dozens of photographs, videos, and drawings of the site in various flow conditions, and having visited the site ourselves (which, although not independent

evidence, helped us better understand the evidence presented at both hearings), his opinions make the most sense.

Mr. Israel-Devadason's bottom line, which we fully credit, is that the new bridge will be better for the natural regime of the stream than if the existing bridge were to remain in place. (S.T. 1037, 1040-41; M.T. 582-83, 688-90.) Removing the old bridge and replacing it with the new bridge is going to improve the condition of the stream. (S.T. 1041.) Hydraulics will improve both within the stream channel and in the floodplain as well. (S.T. 1041; M.T. 690-91.) Mr. Israel-Devadason's analysis was consistent with Mr. Vlot's opinion that, even in the area along the downstream western bank that is of the greatest concern to the Appellants, there will be no significant increase in water velocities. (S.T. 992-97, 1001-14, 1035-36, 1037, 1040-41; M.T. 654-56, 661-62; DOT Ex. 38, 57.) Indeed, Mr. Israel-Devadason predicted based on his model that stream velocities on the west bank would slightly decrease with the new bridge during both the 25-year and 100-year flood events. (M.T. 660; DOT Ex. 39.) This means that there will be no new increase or excess sedimentation of the stream as a result of erosive forces. *See* 25 Pa. Code § 105.161(a)(4).

There has been a great deal of debate in this case about whether a 2D model as opposed to a 1D model was necessary and appropriate for the project for the hydrologic and hydraulics analysis. Indeed, it was a primary, if not the primary, focus of the Appellants' cases at the supersedeas, with Gidumal's expert testifying extensively on why he thought a 2D model was necessary for this project. A 1D model measures stream flow in a single direction as the water moves downstream. It relies on cross-sections taken at various points along the stream, running from bank to bank, that are intended to be representative of the geometry of the local terrain and the model averages the recorded flow velocity across the cross-section. In contrast, in a 2D model

the modeler lays out a mesh of cells that account for the elevation and topography of the stream channel and surrounding features. (S.T. 981-82.)

In its permit application, PennDOT used a 1D model for its H&H analysis after consulting with an outside firm on whether its 1D analysis was appropriate for this project as opposed to a 2D analysis. PennDOT's 1D analysis showed no real appreciable increase in flow velocity from what is happening now in Tincum Creek. (S.T. 879-80, 890-91; DOT Ex. 32, 33.)

The debate whether a 2D model was necessary for this project seems largely academic because PennDOT, in an apparent response to the appeals, hired Mr. Israel-Devadason to perform a 2D analysis to see whether or not its 1D modeling held up.¹⁰ Mr. Israel-Devadason confirmed the conclusion of the 1D modeling that the bridge replacement would overall slightly reduce flow velocity, or at most result in a negligible increase at some points during some storm events. (M.T. 660; DOT Ex. 38, 39.) There is no evidence that E&S over and above what occurs under natural conditions is threatened. Our review is *de novo*, “and we can admit and consider evidence that was not before the Department when it made its initial decision, including evidence developed since the filing of the appeal.” *Telegraphis v. DEP*, 2021 EHB 279, 288. See also *Pequea Twp. v. Herr*, 716 A.2d 678, 686-87 (Pa. Cmwlth. 1998); *Warren Sand & Gravel Co. v. Dep't of Env'tl. Res.*, 341 A.2d 556, 565 (Pa. Cmwlth. 1975). The record that forms the basis of *our* analysis includes the 2D analysis performed by PennDOT's highly credible expert.¹¹

¹⁰ To the extent that the debate remains something other than academic, we credit the expert opinions of Mr. Israel-Devadason and Tiffany Landis of the Department that a 2D study was not necessary for the project. (S.T. 982-83, 1090-91, 1103-04; M.T. 631-32, 649-50.)

¹¹ The experts tell us that 1D models are used in 95 percent of the cases. There is nothing particularly unique about the project in this case from an H&H perspective, a relatively small bridge in a relatively straight stream with a generous floodplain nearby. The high regulatory protection afforded to Tincum Creek as an exceptional value stream does not in and of itself suggest that 2D modeling is necessary when 1D modeling accurately predicts flow.

The Appellants offer little critique of Mr. Israel-Devadason's work, other than saying he used a different 2D model than their own experts used. Gidumal in his post-hearing brief rarely addresses Mr. Israel-Devadason's testimony, either from the supersedeas hearing or the merits hearing. We credit Mr. Israel-Devadason's opinion that he used a model (the SRH-2D model) that is preferred over the ones used by the Appellants' experts because it is approved by the Federal Highway Administration and it was developed more than 20 years ago by a company that has been a pioneer in the 2D modeling industry. (S.T. 983-85; M.T. 632-34, 660-61.) Gidumal faults PennDOT and Israel-Devadason for not including the guardrails in their modeling that will be added to a relatively limited part of Headquarters Road as it raises toward the new bridge. Gidumal contends that guardrails can collect debris during flood events and impede the downstream flow of water. He makes a strained argument that the accumulated debris will act as a dam, and therefore the Department should have permitted this bridge, or perhaps the guardrails individually, as a dam under the regulations. Gidumal says, if the guardrails had been permitted as a dam, PennDOT would have been required to obtain a flowage easement for the land subject to inundation and include it with its permit application. *See* 25 Pa. Code § 105.81(a)(10). The evidence simply does not support this. Separately permitting a guardrail along a roadway as a dam borders on nonsense.

Gidumal also argues that the project should have been subject to 25 Pa. Code § 105.231, which imposes additional requirements for projects that will involve construction or modification of channel changes or dredging for facility construction and maintenance. Gidumal does not identify what elements of the project involve channel change or dredging. Moving the western abutment out of the stream is not a modification of the stream channel; it is removing an obstruction from the channel. Gidumal seems to be only interested in the requirement in Section

105.231 that requires proof of title or flowage easements as part of the permit application, *see* 25 Pa. Code § 105.231(a)(1)(vii), but that only applies if there is a stream channel change to begin with.

Although Gidumal's expert modeled the guardrails as impenetrable obstructions that redirect flow back into the stream channel at increased velocities, (S.T. 124-28, 131-32; G. Ex. 104), we credit Mr. Israel-Devadason's testimony that it was not necessary or appropriate to include the guardrails in order to accurately predict flow conditions. (S.T. 986-87, 1096-98.) He said there is no standard way to model them right now, and in most cases water can still pass through. (S.T. 986-87.) Nevertheless, he credibly contended that the conservative coefficients used in PennDOT's model accounted for uncertainties such as guardrails accumulating debris. (M.T. 635-40; DOT Ex. 74.) Independent of modeling, he credibly opined that the guardrails are at least as likely to be a good thing, slowing down velocities and thereby reducing erosion. (S.T. 1100; M.T. 640-41.) We are struggling to see why the altered flow paths modeled by Dr. Emerson as a result of the guardrails, even if they come to pass, would increase flooding or cause excess E&S.

We likewise credit the testimony of Mr. McAtee, who, based on his real world experience at the site, also did not believe the guardrails needed to be modeled. Mr. McAtee has been to the site during flood conditions and he has not observed any extensive drift accumulating outside of the banks of the stream. (S.T. 877-78, 901, 902-03; M.T. 466-67, 517-18.) He has also seen water flowing through the posts of the fencing along the banks, which have a narrower opening than the proposed guardrails. (S.T. 901.) We also credit Mr. McAtee's opinion that, even if the guardrails did accumulate debris, it would not increase any contraction scouring around the bridge supports because the water would be conveyed to the floodplain. (S.T. 893-93.) The Appellants did not

present any evidence that the guardrails would extend the limits of flooding beyond the existing floodplain or any convincing evidence that we are able to credit that the guardrails or any other activities associated with Headquarters Road itself will increase damage to the floodplain.

It is possible that there could be slightly more inundation of Mr. Gidumal's property due to the lowered road profile, but we credit Mr. Israel-Devadason's testimony that any increase in velocity in the floodplain of Mr. Gidumal's property is miniscule, one- to two-tenths of a foot per second, and will be of an extremely low level of hydraulic force unlikely to cause any damage in and of itself. (M.T. 732-35.) Mr. Israel-Devadason credibly opined that any flooding or damage to Mr. Gidumal's property would happen anyway, not because of the new bridge. (M.T. 738-41.) Indeed, at the risk of sounding overly glib, the simple fact is much of Gidumal's property exists in a floodplain, (DEP Ex. 55), as acknowledged by his own counsel's questioning, (M.T. 103-04). His property floods with the existing bridge there. Indeed, Gidumal produced dozens of pictures showing extensive flooding on his property with the existing bridge there. (G. Ex. 601, 610.) His property is likely to flood irrespective of any bridge at the present location. Floodplains are designed to flood. As we said in our Opinion and Order on the Appellants' Petitions for Supersedeas: "It is important not to lose sight of the fact that floodplains by definition are supposed to flood during high flow periods. They are an invaluable part of a stream's natural regime." *Del. Riverkeeper*, 2022 EHB at 137. The regulations define the floodplain as "[t]he lands adjoining a river or stream that have been or may be expected to be inundated by flood waters in a 100-year frequency flood." 25 Pa. Code § 105.1. The regulatory definition of "floodway"—defined as "[t]he channel of the watercourse and portions of the adjoining floodplains which are reasonably required to carry and discharge the 100-year frequency flood"—presumes, absent evidence to the contrary established by FEMA flood maps or insurance studies, that the floodway extends out 50

feet from the top of a stream bank. 25 Pa. Code § 105.1. *See also Rural Area Concerned Citizens v. DEP*, 2014 EHB 391, 426. However wise or unwise it may be to purchase land immediately adjacent to a stream and within a floodplain is not for us to speculate, but the complaints of flooding ring somewhat hollow when the evidence at the hearing shows substantial flooding already occurring. Indeed, although we do not think it requires an expert to make this observation, Mr. Israel-Devadason opined that flooding is to be expected in this location due to it being a lower area right next to a stream. (M.T. 741.)

We also credit Mr. Israel-Devadason's opinion that the modeling results of the Appellants' experts had several serious telltale signs of anomalies that should have raised questions that were not adequately addressed. (S.T. 1015-21; M.T. 669-77.) These anomalies are not unlike the anomalies that we found in *New Hanover Township, Solebury School*, and *M & M Stone*, that reduced the credibility of the sponsoring expert's opinions. Among other things, the Riverkeeper's expert's results showed an abrupt flow velocity change in the channel that simply cannot occur in nature. (S.T. 1015-21; M.T. 673-75; DOT Ex. 40.) In both *Gidumal's* and the Riverkeeper's models there were unnatural boundaries indicative of improperly constricted modeling, which can introduce errors into the model. (S.T. 1020, 1023, 1073-75; M.T. 670-71, 673-75, 719-20; DOT Ex. 40.) There were also unexplained increases in velocity that do not make sense. (S.T. 1022-23; M.T. 672.) The analysis inaccurately predicted that the roadway would be overtopped in a two-year storm. (S.T. 1024.) Further, the Riverkeeper's expert's velocity *trends* also do not hold up to close review. Water cannot behave in the ways shown, which were like a rollercoaster, rapidly increasing from 6-7 feet per second to 15 feet per second. (S.T. 1030-32, 1084; M.T. 673-75, 722-23; DOT Ex. 58.) Mr. Israel-Devadason credibly testified that these model results were an anomaly that simply cannot happen. (M.T. 722-23.)

Mr. Israel-Devadason's model used 5-by-5-foot cells, close to Pennsylvania's existing LiDAR data of 4.5 feet and allowing for a small margin of error. (M.T. 677-78.) In contrast, the Riverkeeper's expert used 15-by-15-foot cells, and in some critical areas actually used 40-by-40-foot cells, which Mr. Israel-Devadason discovered following the supersedeas hearing when he looked more closely at the Riverkeeper's model's inputs. (S.T. 1025-27; M.T. 677, 692-93; DOT Ex. 74 (at 2-3).) Gidumal's expert also used 40-by-40-foot cells, which is a major departure from the original resolution of the LiDAR data. (M.T. 668-69.) Using the larger cells effectively dumbs down the data, meaning the modeler loses details that otherwise can be captured through the model. (S.T. 1026.) Smaller cells allow for better resolution and less error. (M.T. 678.) These are all serious problems that distort the whole analysis conducted by the Appellants' experts.

Putting these difficulties with the Appellants' experts' work product aside, even taking the Riverkeeper's model at face value, Mr. Israel-Devadason credibly opined that it does not show that velocities in the stream will materially increase with the construction of the new bridge. (S.T. 1027-29; M.T. 680-82, 683-84.) The velocities involved are not cause for concern vis-à-vis erosion and excessive sedimentation. (S.T. 1032-35, 1037; M.T. 680-82, 683-84, 696-97; DOT Ex. 56-58.)

We were also impressed with the expert testimony of Tiffany Landis, P.E., which, although brief, fully corroborated many of the credible opinions of Mr. Israel-Devadason. Ms. Landis credibly opined to a reasonable degree of professional certainty that, based on her independent review of Mr. Israel-Devadason's model results, as well as the results of the previous 1D studies and her own observations, installing the new bridge will actually reduce scour and erosion and return Tincum Creek to a more natural free-flowing state. (T. 1468-72, 1479-80, 1500.) Among other things, the new bridge will not have the western abutment that is currently interfering with

natural flow, and it will have a larger waterway opening, which will convey the flow a lot smoother. (T. 1468-69, 1480.) The western abutment constitutes an obstruction that is interfering with stream flow. (T. 1484.) Minimizing interference by piers in the stream to the extent possible is very important in mimicking natural conditions and preventing debris and ice jams. (T. 1478.)

Ms. Landis also corroborated Mr. Israel-Devadason's testimony that including the guardrails on a limited portion of Headquarters Road in the modeling inputs was unnecessary. (T. 1469-70, 1494, 1497-98.) This issue amounts to a red herring. The majority of flow is contained within the stream channel and the flow that goes into the floodplain is relatively insignificant. (1497-98.) Ms. Landis's testimony shows that, despite any new points raised by the Appellants, the Department remains satisfied that the regulatory criteria for the replacement project have been met.

Even assuming that all of the compelling evidence above is wrong and there will be some additional significant erosion of the western bank as a result of the bridge removal, we would still uphold the Department's issuance of the permit. First, we have no convincing evidence that any sedimentation caused by such erosion will result in any degradation of the stream over and above the erosion that naturally occurs to stream banks. Indeed, some erosion is part of the natural condition of a stream. (S.T. 149-50, 164, 488, 1080, 1170, 1227, 1236-37; M.T. 885-86.) There is simply no convincing evidence that any E&S that might occur is inconsistent with the natural condition of Tinicum Creek. The assumed erosion is what would have been occurring all along had there not been a man-made impediment in place creating unnatural flow conditions, so the assumed erosion is a necessary short-term correction that will allow a return to the equilibrium state reflective of a natural regime.

The Replacement Bridge

A person may not construct, operate, maintain, modify, enlarge, or abandon a dam, water obstruction, or encroachment without first obtaining a permit. 32 P.S. § 693.6(a); 25 Pa. Code § 105.11(a). A water obstruction is a structure located in, along, across, or projecting into a watercourse, floodway, or body of water. 32 P.S. § 693.3; 25 Pa. Code § 105.1. An encroachment is any structure or activity that changes, expands, or diminishes the course, current, or cross section of a watercourse, floodway, or body of water. *Id.* A watercourse is a channel or conveyance of surface water having a defined bed and banks. *Id.*

Ordinarily the location of a watercourse’s regulatory bed and banks comes up if there is a dispute over whether a particular structure or activity is an “encroachment” that needs a permit, *see, e.g., DEP v. Seligman*, 2014 EHB 755, or whether a particular feature is a regulated watercourse at all, *see, e.g., Becker v. DEP*, 2017 EHB 227. Here, there is obviously no question that PennDOT needed a permit. However, the issue still has relevance because, for example, 25 Pa. Code § 105.161 refers to the natural regimen of the “stream” and a stream is a watercourse, 32 P.S. § 693.3; 25 Pa. Code § 105.1, and a watercourse is defined by its bed and banks, *id.*

The regulations require that a bridge’s abutments be aligned with the flow of the stream channel and that they be well set into the stream banks in such a manner as to assure minimal increase in flood elevations. 25 Pa. Code § 105.164. The new bridge will shift both the east and west abutments 15 feet to the west. The Riverkeeper argues unsuccessfully that the 15-foot shift of the eastern abutment will put it within the regulated stream banks of Tinicum Creek and act as a realignment of the stream channel. The Department reasonably interprets the “banks” of the stream channel to be the ordinary high water line of a watercourse. (S.T. 1179-81, 1183; M.T. 852, 908; DEP Ex. 55.) The ordinary high water line tends to be where the vegetation lines the banks

of a stream. (S.T. 1180, 1183-84, 1325; M.T. 853.) The Riverkeeper’s expert appears to have incorrectly delineated the stream banks as that term is used in the regulations. (S.T. 1182.) Among other things, there is a relatively large tree growing on the dry land within the eastern banks as mistakenly identified by the Riverkeeper. (DOT Ex. 13, 28.) Thus, we credit the testimony of Christian Vlot and PennDOT’s Ryan Whittington, P.E. that the shifted eastern abutment will remain outside of the regulated stream. (S.T. 751-52, 761-64, 1209; DOT Ex. 13, 28; Riverkeeper Supersedeas Exhibit No. (“DRN S. Ex.”) 3.)¹²

We do not credit the Riverkeeper’s expert Ms. Paist-Goldman’s assertion that 25 feet of the stream bank, measured from the bank inward into Mr. Gidumal’s pastures, will be eroded away as a result of the new bridge’s 15-foot shift in the western abutment within the first five years, causing the loss of 100 trees, and then be subject to perpetual erosion thereafter. (M.T. 198-201, 220-21, 231.) Nor do we credit her assertion that the 25 feet of bank erosion will continue for several hundred to 1,000 feet downstream of the bridge. (M.T. 201-02.) For one thing, Ms. Paist-Goldman admitted that she had not done any analysis on stream bank erosion and merely offered her opinion as an “off the cuff” “gut feeling” based on her professional experience and judgment. (M.T. 275-76, 280.) Second, we question why we have not seen that level of erosion already upstream of the bridge. If the soils are as highly erodible as Ms. Paist-Goldman posits, then it seems that substantial portions of the banks would have eroded away during recent significant storm events like Hurricane Ida.

Mr. McAtee testified that he has been out to the site during flood conditions and the downstream western bank that Ms. Paist-Goldman is concerned about is exposed to heavy flows

¹² Assuming *arguendo* that the abutment will extend past the stream’s east bank, there was no convincing evidence showing that the new location would interfere with stream flow or the stream’s return to a natural condition.

now with the existing bridge. (M.T. 462, 471-72; DOT Ex. 71.) He testified that the slope wall in front of the proposed shifted abutment is designed to absorb any impact from the velocity of the flow and redirect that energy back into the middle of the stream channel. (S.T. 850-51, 865-66, 868; M.T. 462.) The project will also include embedded rip rap armoring on the downstream western bank for around 15-20 feet beyond the bridge. (M.T. 511, 882-83.) The rip rap will be depressed two feet into the bank, choked with natural stream bed material, then backfilled with two feet of soil to secure it. (M.T. 578-80, 919-20, 932; DOT Ex. 30.) Mr. Israel-Devadason credibly testified that the rip rap will be able to withstand velocities much greater than 10 feet per second. (M.T. 697-98.) Further, and crucially, Mr. McAtee conducted soil borings at the site and found that in some places there was only 6 inches of soil cover before hitting bedrock. (M.T. 513-15; DOT Ex. 30a.) Mr. Israel-Devadason credibly opined that, with the anticipated velocities, he does not expect there to be anything close to 25 feet of bank erosion because the flow simply does not have enough energy to cause that degree of erosion. (M.T. 663, 684.)

In any event, we find that the new bridge needs to be shifted exactly as proposed by PennDOT and approved by the Department. To have left the new bridge in the same location as the existing bridge would have failed to satisfy the regulatory criteria because the western abutment would have remained within the stream channel. As discussed above, the existing western abutment is clearly within the banks of Tinicum Creek, and currently takes the full force of the stream. (S.T. 576, 1181, 1205; M.T. 853-54; DEP Ex. 55.) This is obvious in some of the Riverkeeper's own photographs, where the western abutment is surrounded by the flow of the stream. (DRN Super. Ex. 6.) The western abutment of the replacement bridge will be shifted back 15 feet west to better align with the channel of Tinicum Creek as it exists now. (S.T. 575-76.) Moving the eastern abutment over is necessary in order to move the offending western abutment

and keep the support pier in the same location as the existing western pier, (DOT Ex. 7 (at 61, 63)), and still keep the abutment as far as possible outside the eastern side of the stream. With the stream in its current condition, the existing bridge is very poorly placed not only from an engineering perspective but relative to environmental degradation as well. Leaving the western abutment where it is now would leave an obstruction within the stream and leave a source of scour in place. (M.T. 844-45.) The new bridge will eliminate this serious ongoing problem by aligning the bridge structure to where the stream is now.¹³

The regulations require bridges to be designed with the minimum number of piers and obstructions as possible. 25 Pa. Code § 105.163. The new bridge accomplishes that by utilizing only one pier within Tincum Creek, as opposed to two piers with the existing bridge, or any so-called rehabilitation of the existing bridge. PennDOT evaluated the option of constructing a bridge with a single span, meaning no support piers within Tincum Creek, but it was determined to be unfeasible. (S.T. 766-67, 852.) A single span bridge would have required a deeper superstructure, the roadway would need to be elevated, and greater portions of the western floodplain would need to be filled in. (S.T. 955-57, 963-64.) The single pier within the stream will be smaller than the existing piers, approximately three-and-a-half feet wide at the base instead of six feet wide, which will lessen the potential for debris accumulation during flood events. (S.T. 845, 852; M.T. 432-34, 459, 582-83.) By only having a single obstruction, the bridge will have improved flow characteristics during flood events and less potential for the displacement of stream bed material that could create new gravel bars and downstream sediment deposits. (S.T. 846.) Removing the pier will increase flow conveyance in the channel by 18-20%. (S.T. 1040; M.T. 461, 689-91.) The

¹³ The shifted western abutment also has the ancillary benefit of accommodating the turning radius of emergency vehicles at the intersection of Headquarters Road and Sheep Hole road. (S.T. 848-49; M.T. 416-17.)

new bridge is designed to improve the flow characteristics of Tinicum Creek and more closely mimic its natural free flow. (S.T. 850, 852, 888-89; M.T. 463-64, 688-90.) By having an increased hydraulic area and fewer obstructions, the potential for debris accumulation, erosion, and scour are all reduced, which naturally reduces impacts to Tinicum Creek. (S.T. 887-90; M.T. 582-83, 867-68.) Gidumal's expert agreed that the removal of one of the piers would create a more natural flow regime, (S.T. 167-68), and the Riverkeeper's expert said it would improve the conveyance capacity of water through the bridge, (S.T. 469).

A permit application will not be approved by the Department for an exceptional value stream or designated Wild and Scenic River like Tinicum Creek unless the applicant demonstrates and the Department finds that the project will not have an adverse impact upon the public natural resources. 25 Pa. Code § 105.16(c). The Department correctly analyzed the effect of the water obstructions of the replacement bridge on the natural regime and ecology of Tinicum Creek. (S.T. 1301.) The National Park Service determined that there would be no direct and adverse effect on Wild and Scenic Rivers provided that the project is constructed in accordance with PennDOT's plans. (M.T. 859-61, 871; DEP Ex. 40.) The Department reasonably concluded that the project would have very little impact on the public natural resources. To the contrary, this project is highly beneficial to the public natural resources and will not itself cause any environmental harm. The new bridge has been designed to meet the regulatory criteria relative to Tinicum Creek in terms of preserving the natural regime, controlling flow velocity with respect to erosion of the stream bed and banks, reducing the number of piers within the stream, and aligning the abutments with the flow of the stream channel. The new bridge also comports with modern safety standards for motorists, improving sight distances and the ability to see oncoming traffic as a driver approaches the bridge. (S.T. 881-82; DOT Ex. 34.)

Historical Values and Article I, Section 27

The Headquarters Road Bridge is within the Ridge Valley Rural Historic District, and it has been designated as a contributing element to the historic district. The Appellants assert in general terms that removing the existing bridge will harm the historic value of the area. There are portions of the regulations that require the Department to assess an obstruction or encroachment's impact on cultural, archaeological, and historical landmarks. *See* 25 Pa. Code § 105.14(b)(5) (Department required to assess impacts of a project on, *inter alia*, cultural, archaeological, and historical landmarks, and state and local historical sites). *See also* 25 Pa. Code § 105.13(x) (impacts on areas or structures of historic significance). The Appellants in their briefs never really say that the Department violated the law in issuing the permit due to the historic nature of the bridge. That may be because the issue has truly been exhaustively evaluated. The Department's environmental assessment documented that several alternatives were evaluated to avoid or minimize the impact to the historic district, but the chosen replacement bridge was determined to cause the least overall harm. (DOT Ex. 15 (at 3).) (*See also* DOT Ex. 7, 10.) Further, although it is not binding on us, in *Delaware Riverkeeper Network v. Pa. Department of Transportation*, *supra*, the federal district court extensively discussed the effects of the project on the area's historic resources, including the bridge itself, the historic district as a whole, and Tinicum Creek as it relates to the historic district, and concluded that PennDOT had demonstrated appropriate sensitivity to historical values. (DOT Ex. 8 (at 50-60).)

PennDOT entered into a Memorandum of Agreement with the Federal Highway Administration, the Pennsylvania State Historic Preservation Officer, and the Advisory Council on Historic Preservation to ensure that the project's impacts to the historic resources of the area were mitigated to the greatest extent possible. (M.T. 856-57, 858; DEP Ex. 32; DOT Ex. 49.) The

Memorandum also established a nine-member Design Advisory Committee consisting of people from the National Park Service, the Advisory Council on Historic Preservation, the Pennsylvania State Historic Preservation Office, Bucks County officials, and Tinicum Township supervisors, who would be involved during project development and also engaged towards the beginning of the construction process. (*Id.*) The Memorandum also requires PennDOT to salvage stone during the demolition of the existing bridge to reuse as stone facing on the abutments, wingwalls, and approach roadway barriers for the new bridge. (*Id.*) One of the permit's special conditions requires PennDOT to abide by the Memorandum. (M.T. 864, 873; DOT Ex. 14 (at 4).)

Having seen all of the photographs of the bridge in its highly dilapidated state, it is hard to understand how the bridge is still meaningfully contributing to the historic value of the area. Indeed, no one has argued that keeping the bridge in its current condition is an option.

The permit includes special conditions that demonstrate the Department went beyond the strict bounds of the regulatory requirements of Chapter 105 and included provisions requiring compliance with the Memorandum of Agreement, as well as monitoring requirements set forth by the National Park Service. All of these provisions are designed with an eye toward preserving and maintaining the historic values of the existing bridge and the surrounding historical district. Clearly, the historic significance of the structure must be factored into the analysis. *See* 25 Pa. Code §§ 105.14(b)(5), 105.16(a). By the same token, harm to the stream should not be ignored when considering the historic value of the obstruction. To the extent the Department had a duty to consider the historical resources of the project in issuing the permit, it appears to have done just that. The record shows that the Department performed the proper balancing here.

The Riverkeeper also argues that the Department violated its duties under Article I, Section 27 of the Pennsylvania Constitution by authorizing the removal of the Headquarters Road Bridge

and thus the removal of its historic and esthetic values. Article I, Section 27 of the Pennsylvania Constitution provides:

The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic, and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all people.

PA. CONST. art I, § 27. The Board has articulated its standard for assessing Article I, Section 27 challenges as follows:

We first must determine whether the Department has considered the environmental effects of its action and whether the Department correctly determined that its action will not result in the unreasonable degradation, diminution, depletion or deterioration of the environment. Next, we must determine whether the Department has satisfied its trustee duties by acting with prudence, loyalty and impartiality with respect to the beneficiaries of the natural resources impacted by the Department decision.

Stocker v. DEP, 2022 EHB 351, 371 (quoting *Del. Riverkeeper Network v. DEP*, 2018 EHB 447, 493 (citing *Ctr. for Coalfield Justice v. DEP*, 2017 EHB 799, 858-59, 862; *Friends of Lackawanna v. DEP*, 2017 EHB 1123, 1163)). “The burden of showing that the Department acted unconstitutionally rests with the third-party appellant.” *Logan v. DEP*, 2018 EHB 71, 115 (citing *Stedge v. DEP*, 2015 EHB 577, 617; *Brockway Borough Mun. Auth. v. DEP*, 2015 EHB 221, 250, *aff'd*, 131 A.3d 578 (Pa. Cmwlth. 2016)).

Initially, as discussed above, there is ample evidence that the existing bridge presents a safety and environmental hazard. Further, both the Department and PennDOT considered the historic and esthetic values of the existing bridge in the design of the new bridge, which preserves stone from the existing bridge. It is also difficult to imagine what historic and esthetic value the Headquarters Road Bridge is currently contributing in its closed and severely deteriorated state.

The Riverkeeper elevates form over substance when it criticizes the Department for not performing some sort of separate constitutional environmental review of the permit application.

Conducting a separate “constitutional analysis” might be warranted in some instances, but more important is actually considering the constitutional values espoused by Article I, Section 27 and reaching a decision that is consistent with the preservation of those values. *See Liberty Twp. v. DEP*, EHB Docket No. 2021-007-L, slip op. at 105-07 (Adjudication, Jan. 8, 2024). Indeed, the Riverkeeper makes clear in its briefing that its challenges are all about the *process* that the Department followed in evaluating PennDOT’s permit application. (*See* DRN Reply Brief at 2 (“DRN’s challenge is to the process that PADEP followed in not considering, evaluating and balancing, itself, whether and how to preserve the scenic, historic and esthetic values of the Ridge Valley Historic District...and the exceptional water quality of Tinicum Creek...” (emphasis in original)); DRN Brief at 54 (“insufficiency of the agencies’ compliance procedures used to execute their Constitutional duty...”).) First, we detect nothing improper about the process the Department followed in evaluating PennDOT’s permit application. Second, the Riverkeeper has failed to explain how any alleged deficiency in the process should have resulted in a different outcome. Even if we assume for purposes of argument only that there was some defect in the Department’s review process, our *de novo* review reveals nothing wrong about the Department’s ultimate decision to issue the permit. The Riverkeeper complains about the process, but it has not come forward with the evidence to show why the decision made at the end of the process was wrong.¹⁴

The Riverkeeper also criticizes the Department for what it calls deferring to other Commonwealth agencies to conduct certain aspects of the review relative to the historic values of the bridge. For instance, the Department relied on the Pennsylvania Historical and Museum Commission to help determine that demolishing the existing bridge would not negatively impact

¹⁴ The Riverkeeper says that the Department could not have carried out its constitutional duties without evaluating the possibility of bridge rehabilitation as an alternative to taking down the existing bridge and building a new one, claiming that PennDOT did not present the Department with the rehabilitation alternative. But as discussed *supra*, this is factually incorrect.

the scenic, esthetic, and historic values of the area. (M.T. 120-21, 123.) The Riverkeeper asserts that the Department violated Article I, Section 27 by relying on a separate agency and not conducting its own review. However, the evidence does not suggest the Department blindly relied upon determinations made by other agencies. The Department testified that it took into account the findings and recommendations of the Historical Commission and then made an assessment of whether or not the project meets the requirements of the Chapter 105 regulations with respect to historic properties. (M.T. 120-21, 123-24.) This seems perfectly reasonable.

We see nothing inappropriate in enlisting the expertise of other agencies as part of a permit review. There is nothing inherently improper about the Department consulting with other state agencies, such as the Pennsylvania Historical and Museum Commission. In *Montgomery Township v. DER*, 1995 EHB 483, the Department had a similar regulatory obligation under 25 Pa. Code § 71.21(a)(5)(i)(K) to ensure that the selected alternative in a sewage facilities plan revision was consistent with the objectives and policies of Section 7 of the Historic Preservation Act, 37 Pa.C.S. § 507, which requires Commonwealth agencies to cooperate fully with the Pennsylvania Historical and Museum Commission in the preservation, protection, and investigation of archaeological resources. The appellant in that case also argued that the Department violated Article I, Section 27 because it did not conduct an independent review of the effects of a spray irrigation facility on the scenic, esthetic, and historic resources of the surrounding area. Instead, the appellant alleged that the Department simply relied upon the findings of the Historical Commission. There, we found nothing improper about the Department “deferring to the judgment of another Commonwealth agency with superior expertise in the field of historical and archaeological resources.” *Id.* at 538.

Nowhere in Article I, Section 27 does it say that the Department must exclusively carry out each and every duty listed. Every part of government has its role to play in upholding those values, including, presumably, the Historical Commission. *Liberty Twp., supra*, slip op. at 108 (quoting *Peifer v. Colerain Twp. Zoning Hearing Bd.*, 302 A.3d 811, 816 (Pa. Cmwlth. 2023) (“Article I, Section 27 ‘imposes fiduciary duties on the Commonwealth and all state, county and local agencies....’”). We think that the Department may very well act consistently with its duties under the Constitution when it acknowledges areas outside of its expertise and utilizes other agencies of the Commonwealth for support. The record in this case reflects that the Department undertook specific consideration of the historic and esthetic value of the area in its review of the project. By coordinating with the National Park Service and the Pennsylvania Historical and Museum Commission, and by including permit conditions that require compliance with the Memorandum of Agreement with those agencies, the Department effectuated a review consistent with its obligations under the Pennsylvania Constitution.

It is worth noting that Article I, Section 27 speaks in terms of the “preservation of the natural, scenic, historic, and esthetic values **of the environment**,” and the “public **natural** resources.” (Emphasis added.) *See also* 25 Pa. Code § 105.16(a). It is not clear to us that a man-made bridge is the type of *natural* resource with a historic *environmental* value that Article I, Section 27 is designed to safeguard. We question the approach of the Appellants that seeks to construe the Constitution in a way that vests a right in the people of the Commonwealth in the preservation of values from a human-built structure instead of a natural environment. Certainly there is historic and esthetic value in old growth forests and waterways that have existed for centuries. But we struggle to find a rationale that Article I, Section 27 vests a constitutional right to the preservation of a historic bridge that is falling apart.

To the extent the Riverkeeper is correct and Article I, Section 27 does include a historic man-made bridge among the public *natural* resources to be conserved and maintained, and to the extent that the Department had to balance the preservation of the scenic and historic value of the man-made bridge with the threat to environmental values due to a collapse of the existing bridge, and the ongoing environmental harm presented by the unnatural intrusion of the existing bridge on Tincum Creek, the evidence fully supports the Department's decision to issue the permit. The current bridge is causing an unreasonable degradation of the natural resources of the Commonwealth. While the Appellants appear to desire to perpetuate this damage, the new bridge design will alleviate that damage. When considering the environmental harm that is being caused by the existing bridge and the fact that the rehabilitated bridge would simply continue that harm, it is hard to see any coherent argument under Article I, Section 27 for perpetuating that environmental harm as the Riverkeeper wants to do.

Property Issues

Gidumal's primary argument with respect to property issues is that PennDOT does not own or have the right to occupy the land needed to complete the demolition of the old bridge and the construction of the new bridge, which would be part of his property. Therefore, he argues, the Department never should have issued the permit to PennDOT. Through a somewhat long and tortured process, in January 2020 PennDOT apparently purchased a temporary easement on Mr. Gidumal's property from the prior owner to facilitate the demolition and construction work for the project. However, PennDOT apparently did not record the easement until after Mr. Gidumal purchased the property and recorded his deed in August 2020. Various litigation in the courts of common pleas and before the Commonwealth Board of Property commenced. At some point, PennDOT decided to condemn the land that was subject to the easement. Recently, the

Commonwealth Court appeared to resolve these issues. *See* *Gidumal and Virtus Capital Advisors, LLC v. Dep’t of Transp. (State Board of Property)*, No. 518 C.D. 2023 (Pa. Cmwlt. July 19, 2024), *app. for recon./rearg. denied*; *In Re: Condemnation by the Commonwealth of Pennsylvania, Department of Transportation, of Right-of-Way for State Route 1012, Section BRC, in the Township of Tincum (Appeal of: Virtus Capital Advisors, LLC)*, No. 1284 C.D. 2023 (Pa. Cmwlt. July 19, 2024), *app. for recon./rearg. denied*.

The details of this litigation are not particularly important for our current purposes in reviewing the permit under appeal. As the Commonwealth Court made clear in its recent Opinion, the property disputes between *Gidumal* and PennDOT are immaterial to our review of the water obstruction and encroachment permit:

The litigation before the Environmental Hearing Board does not implicate the mootness analysis. As PennDOT observes, the Department of Environmental Protection “does not review property issues during its analysis of a permit application for a bridge.” Environmental Hearing Board Opinion and Order on Supersedeas, 4/1/2022, at 36; S.R.R. Exhibit A. Rather, the Department is concerned with the environmental impact of the bridge replacement project and “not with any property disputes” that may arise out of that project. *Id.* Accordingly, **whether PennDOT’s claim to own easements on the permit applications was false has no relevance to the merits of the permits issued by the Department of Environmental Protection to PennDOT.** *Gidumal*, along with the Delaware Riverkeeper Network, can continue to challenge the environmental merits of whether PennDOT’s bridge replacement project was properly permitted.

Gidumal and Virtus Capital Advisors, LLC v. Dep’t of Transp. (State Board of Property), No. 518 C.D. 2023, slip op. at 9 (Pa. Cmwlt. July 19, 2024) (emphasis added). Thus, we have focused our review in this Adjudication on the environmental impacts of the project and not on any irrelevant property disputes.

Nevertheless, *Gidumal* also makes some arguments regarding his property that are couched in the Chapter 105 regulations. For instance, *Gidumal* cites 25 Pa. Code § 105.161(a)(2), which provides that bridges shall be designed or constructed so as not to “create or constitute a hazard to

life or property....” He also argues that the Department did not properly evaluate the impacts of the project on his property under 25 Pa. Code § 105.14(b)(1), (3), (5), and (12). However, as discussed extensively above, there is no credible evidence that the new bridge is likely to create any threat or hazard to life or property.

CONCLUSIONS OF LAW

1. The Environmental Hearing Board has jurisdiction over this matter. 32 P.S. §§ 693.24; 35 P.S. § 7514.

2. The Board reviews Department actions *de novo*, meaning we decide the case anew on the record developed before us. *Solebury School v. DEP*, 2014 EHB 482, 519; *O’Reilly v. DEP*, 2001 EHB 19, 32; *Warren Sand & Gravel Co. v. Dep’t Env’tl Res.*, 341 A.2d 556 (Pa. Cmwlth. 1975).

3. In third-party appeals, the appellants bear the burden of proof. 25 Pa. Code § 1021.122(c)(2); *Joshi v. DEP*, 2019 EHB 356, 364; *Jake v. DEP*, 2014 EHB 38, 47.

4. The appellants must show by a preponderance of the evidence that the Department’s action was not lawful, reasonable, or supported by our *de novo* review of the facts. *Logan v. DEP*, 2018 EHB 71, 90; *Friends of Lackawanna v. DEP*, 2017 EHB 1123, 1156.

5. In order to be lawful, the Department must have acted in accordance with all applicable statutes, regulations, and case law, and acted in accordance with its duties and responsibilities under Article I, Section 27 of the Pennsylvania Constitution, PA. CONST. art. 1, § 27. *Stocker v. DEP*, 2022 EHB 351, 363 (citing *Ctr. for Coalfield Justice v. DEP*, 2017 EHB 799, 822; *Brockway Borough Mun. Auth. v. DEP*, 2015 EHB 221, *aff’d*, 131 A.3d 578 (Pa. Cmwlth. 2016)).

6. The resolution of evidentiary conflict, witness credibility, and evidentiary weight are matters committed to the discretion of the Board. *EQT Prod. Co. v. Dep't of Env'tl. Prot.*, 193 A.3d 1137, 1149 (Pa. Cmwlth. 2018); *Kiskadden v. Dep't of Env'tl. Prot.*, 149 A.3d 380, 387 (Pa. Cmwlth. 2016).

7. The replacement of Headquarters Road Bridge is consistent with the protection of the natural regime of Tincum Creek. 32 P.S. § 693.2(3); 25 Pa. Code § 105.2(4); 25 Pa. Code § 105.16(d); 25 Pa. Code § 105.161(a)(3).

8. The new bridge will not create a threat or hazard to life or property. 25 Pa. Code § 105.161(a)(2).

9. The new bridge will not result in excess sedimentation of the stream or increase water velocity or direct flow in a manner that results in erosion of stream beds and banks over and above what occurs when the stream is flowing in accordance with its natural regime. 25 Pa. Code § 105.161(a)(3) and (4).

10. The project does not involve the construction or modification of a channel change in Tincum Creek. 25 Pa. Code § 105.231.

11. The new bridge's abutments will be aligned with the flow of the stream channel of Tincum Creek and they be well set into the stream banks in such a manner as to assure minimal increase in flood elevations. 25 Pa. Code § 105.164.

12. The project will not have an adverse impact on Tincum Creek as an exceptional value stream and a Wild and Scenic River. 25 Pa. Code § 105.16(c).

13. The Department and PennDOT appropriately considered the impact of removing the existing bridge in terms of historic resources. 25 Pa. Code § 105.13(x); 25 Pa. Code § 105.14(b)(5); 25 Pa. Code § 105.16(a).

14. The Department did not err in relying on the expertise of the Pennsylvania Historical and Museum Commission to assess the project's impact on historic and cultural resources. *Montgomery Twp. v. DER*, 1995 EHB 483, 538.

15. It is not the responsibility of the Department or this Board to assess private property disputes in the context of reviewing an application for, or hearing an appeal of, a water obstruction and encroachment permit issued under the Dam Safety and Encroachments Act. *Gidumal and Virtus Capital Advisors, LLC v. Dep't of Transp. (State Board of Property)*, No. 518 C.D. 2023, slip op. at 9 (Pa. Cmwlth. July 19, 2024).

16. The Appellants have not shown that the Department acted contrary to its duties and obligations under Article I, Section 27 of the Pennsylvania Constitution in issuing the permit. PA. CONST. art. 1, § 27; *Stocker*, 2022 EHB 351, 371; *Del. Riverkeeper Network v. DEP*, 2018 EHB 447, 493; *Logan v. DEP*, 2018 EHB 71, 115; *Ctr. for Coalfield Justice v. DEP*, 2017 EHB 799, 858-59, 862; *Brockway Borough Mun. Auth. v. DEP*, 2015 EHB 221, 250, *aff'd*, 131 A.3d 578 (Pa. Cmwlth. 2016).

17. The Appellants have not met their burden of proof on their claims in this appeal. 25 Pa. Code § 1021.122(c)(2).



COMMONWEALTH OF PENNSYLVANIA
ENVIRONMENTAL HEARING BOARD

**DELAWARE RIVERKEEPER NETWORK
AND THE DELAWARE RIVERKEEPER,
MAYA VAN ROSSUM and STEVEN
GIDUMAL AND VIRTUS CAPITAL
ADVISORS, LLC**

v.

**EHB Docket No. 2021-108-L
(Consolidated with 2021-109-L)**

**COMMONWEALTH OF PENNSYLVANIA,
DEPARTMENT OF ENVIRONMENTAL
PROTECTION, and PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION,
Permittee**

ORDER

AND NOW, this 27th day of August, 2024, it is hereby ordered that the Appellants’ appeals are **dismissed**.

ENVIRONMENTAL HEARING BOARD

s/ Steven C. Beckman

STEVEN C. BECKMAN
Chief Judge and Chairperson

s/ Bernard A. Labuskes, Jr.

BERNARD A. LABUSKES, JR.
Board Member and Judge

s/ MaryAnne Wesdock

MARYANNE WESDOCK
Board Member and Judge

s/ Paul J. Bruder, Jr.

PAUL J. BRUDER, JR.
Board Member and Judge

* **Judge Sarah L. Clark is recused in this matter and did not participate in the decision.**

DATED: August 27, 2024

c: DEP, General Law Division:
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(*via electronic mail*)

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