UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE ADMINISTRATOR

In the Matter of:	)	
	)	
Tony L. Brown and Joshua A. Brown	)	**Docket No. CWA-07-2016-0053**
d/b/a/ Riverview Cattle,	)	
	)	
Respondents.	)	

INITIAL DECISION AND ORDER

DATED: October 15, 2020

PRESIDING OFFICER:
Administrative Law Judge Christine Donelian Coughlin

APPEARANCES:

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I. PROCEDURAL HISTORY

The United States Environmental Protection Agency ("EPA" or "Agency"), Director of the Water, Wetlands, and Pesticides Division, Region 7 ("Complainant"), initiated this proceeding on May 10, 2016, by filing a Complaint ("Compl.") against Tony L. Brown and Joshua A. Brown (collectively, "Respondents"), pursuant to the authority granted in 33 U.S.C. § 1319(g). The Complaint alleges that Respondents violated Section 301(a) of the Clean Water Act[1] ("CWA"), 33 U.S.C. § 1311(a), on a minimum of six occasions over a five-year period, spanning from May 10, 2011 to May 10, 2016, through single or multi-day discharges of pollutants from their concentrated cattle feeding operation in Armstrong, Iowa into waters of the United States without a permit under Section 402 of the CWA, 33 U.S.C. § 1342. Complainant later refined the period of alleged violations to the period from May 10, 2011 through June 18, 2014,[2] and specified that there were 42 days of violation during this period.[3] For these alleged violations, the Complainant seeks the imposition of civil penalties against Respondents in the amount of $96,000. Respondents, though counsel, filed an Answer on June 13, 2016. In their Answer, Respondents deny the violations alleged in the Complaint.

The parties participated in this Tribunal's Alternative Dispute Resolution process from July 6, 2016, through November 7, 2016, after which, on November 9, 2016, I was designated to preside over the litigation of this matter. On November 14, 2016, I issued a Prehearing Order directing the parties to file and serve prehearing exchanges. Consistent therewith, Complainant submitted an Initial Prehearing Exchange on January 6, 2017, accompanied by proposed exhibits; Respondents submitted their Prehearing Exchange on February 27, 2017, accompanied with proposed exhibits; and Complainant filed a Rebuttal Prehearing Exchange on March 31, 2017, accompanied by additional proposed exhibits.[4] Complainant and Respondents each supplemented their prehearing exchanges with additional material in advance of the hearing.

Following the submission of the parties' prehearing exchanges, Complainant filed a Motion for Accelerated Decision as to Liability ("Motion for Accelerated Decision"), along with a memorandum in support of its motion and supporting declarations on May 1, 2017. Respondents filed a Response to Complainant's Motion for Accelerated Decision as to Liability on May 30, 2017, along with a memorandum and statements in support of this document. Complainant subsequently filed both a Rebuttal to Respondents' Opposition to Motion for

[1] The Clean Water Act is the common name of the Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1387.

[2] Notably, while Complainant specifically identified the refined period of alleged violations as the period "between May 10, 2011 and June 18, 2014," Compl. I. Br. at 2, Complainant clarified that it intends to include the date of June 18, 2014 within this period of alleged violations, Compl. I. Br. at 31 n.40. Accordingly, this refined period of alleged violations is more appropriately characterized as occuring from May 10, 2011 through June 18, 2014.

[3] As Complainant reduced the period of alleged violations in this proceeding, and did not pursue its initial allegations of violations after June 18, 2014 at hearing, I did not consider Respondents' liability for discharges following this shortened period. *See* Compl. I. Br. at 1-2.

[4] The filing deadlines for Respondents' Prehearing Exchange and Complainant's Rebuttal Prehearing Exchange were extended, upon request of the parties, by orders issued January 12, 2017, and February 22, 2017.

Accelerated Decision as to Liability, and a Corrected Rebuttal to Respondents' Opposition to Motion for Accelerated Decision as to Liability, on June 15, 2017, along with a simultaneously filed declaration. By order issued on March 13, 2018, I denied Complainant's Motion for Accelerated Decision. Thereafter, I scheduled the evidentiary hearing in this proceeding.

Upon Complainant's Unopposed Motion for Continuance, I postponed the hearing in this matter, scheduled to be conducted June 18-22, 2018, and subsequently rescheduled the hearing in this matter by order issued July 17, 2018. The hearing was held in Des Moines, Iowa, on December 12-14, 2018, and December 17-18, 2018. In advance of the hearing, the parties filed joint stipulations in this matter on November 16, 2018, which were admitted into evidence at the hearing as Joint Exhibit ("JX") 1, and incorporated factual stipulations as well as stipulations regarding exhibits and witness testimony.

At the hearing, Complainant presented Complainant's Exhibits ("CX") 1-17, and 19-56, which were admitted into evidence.[5] Complainant presented testimony from five witnesses, including Lois Benson ("Ms. Benson"), an environmental specialist for the Iowa Department of Natural Resources ("IDNR"); Trevor Urban ("Mr. Urban"), a hazardous waste and CWA National Pollutant Discharge Elimination System inspector with Region 7 of the EPA; Rickey Roberts ("Mr. Roberts"), a life-scientist and inspector with Region 7 of the EPA; Seth Draper ("Mr. Draper"), a water compliance officer for Region 7 of the EPA; and Steven Wang, Ph.D. ("Dr. Wang"), a hydrologist and life-scientist with Region 7 of the EPA. Dr. Wang was qualified at the hearing as an expert in hydrology, modeling, and water quality. *See* Tr. 553.

Following the conclusion of Complainant's direct case at hearing, Respondents moved for a directed verdict on all violations in the Complaint other than the violation alleged to have occurred on June 17, 2014, on the basis that such violations were not sufficiently pleaded in the Complaint. *See* Tr. 693. Complainant opposed this oral motion, *see* Tr. 693-97, and I denied the motion following presentation of arguments from both parties, Tr. 697-98. Thereafter, Respondents proceeded with their presentation of evidence, introducing Respondents' Exhibits ("RX") 1-50, which were admitted into evidence. Additionally, Respondents presented testimony from eight witnesses, including Respondents; Stephen Madden, a farm operator performing manure removal services at Respondents' cattle operation; Gary Brown and Dawn Brown, Respondents' parents and operators of a hog farm adjacent to Respondents' cattle operation; Ms. Benson,[6] the environmental specialist for IDNR who previously testified for Complainant; Dallas Heikens ("Ms. Heikens"), a professional engineer who performed services for Respondents at their cattle operation; and Gerald Hentges ("Mr. Hentges"), a consulting hydrogeologist. Relevant to the testimony of such witnesses, Ms. Heikens was qualified at the hearing as an expert in the field of civil engineering, *see* Tr. 1094-95, and Mr. Hentges was qualified at the hearing as an expert in hydrogeology, *see* Tr. 1198-99.

The Hearing Clerk of the Office of Administrative Law Judges received the certified transcript of the hearing on January 29, 2019, and electronic copies of the transcript were issued

[5] Notably, Complainant's Exhibits encompass an irregular series of numbers, including exhibits identified by whole number designations and exhibits identified by decimal number designations.

[6] Ms. Benson testified on behalf of both Complainant and Respondent in this matter.

to counsel for the parties on January 30, 2019. Subsequently, I scheduled filing deadlines for the parties' post-hearing submissions by order issued January 31, 2019. The parties submitted a Joint Motion to Conform the Transcript to the Actual Testimony on March 7, 2019, and I granted this motion and accordingly modified the hearing transcript by order issued on March 15, 2019. Consistent with the schedule for post-hearing submissions, Complainant filed its Initial Post-Hearing Brief ("Compl. I. Br.") on March 15, 2019; Respondents filed their Initial Post-Hearing Brief ("Resp. I. Br.") on April 15, 2019; Complainant filed its Reply Post-Hearing Brief ("Compl. Reply Br.") on April 29, 2019; and Respondents filed their Reply Post-Hearing Brief ("Resp. Reply Br.") on May 13, 2019.[7]

II. STATUTORY AND REGULATORY BACKGROUND

The CWA, 33 U.S.C. §§ 1251-1387, as amended, was enacted to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). In furtherance of this objective, Section 301(a) of the CWA prohibits "the discharge of any pollutant by any person," except as otherwise provided for in its provisions. 33 U.S.C. § 1311(a).[8]

The definition of "discharge of a pollutant" for relevant provisions of the CWA encompasses "any addition of any pollutant to navigable waters from any point source." 33 U.S.C. § 1362(12). The term "pollutant" is defined by the CWA to include, among other meanings, " . . . solid waste, . . .biological materials, . . . and industrial, municipal, and agricultural waste discharged into water." 33 U.S.C. § 1362(6). In turn, "navigable waters" are defined by the CWA as "the waters of the United States." 33 U.S.C. § 1362(7). Additionally, "point source" is defined by the CWA as "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged." 33 U.S.C. § 1362(14).

Notwithstanding the general prohibition against pollutant discharges in 33 U.S.C. § 1311(a), the CWA establishes the National Pollutant Discharge Elimination System ("NPDES") permit program, allowing the EPA, and states qualified by the EPA, to issue permits for the discharge of pollutants. 33 U.S.C. § 1342(a)-(b). The regulations implementing the NPDES permit program with relation to concentrated animal feeding operations ("CAFOs") provide that "[a] CAFO must not discharge unless the discharge is authorized by an NPDES permit." 40 C.F.R. § 122.23(d)(1). Pursuant to the regulations, to obtain such authorization a "CAFO owner or operator must either apply for an individual NPDES permit or submit a notice of intent for coverage under an NPDES general permit." *Id*.

The regulations define an animal feeding operation as a lot or facility where,

[7] Upon Respondents' unopposed motion, I extended the filing deadline for Respondents' Post-Hearing Brief by order issued April 12, 2019.

[8] The definition of "person" in the CWA includes "an individual." 33 U.S.C. § 1362(5). Respondents have admitted that they are each a person within this definition. *See* Compl. ¶ 4; Answer ¶ 4.

> (i) Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and
>
> (ii) Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

40 C.F.R. § 122.23(b)(1).[9] The definition of a CAFO provided for in the regulations encompasses an animal feeding operation that is defined as a "Large CAFO" or as a "Medium CAFO." 40 C.F.R. § 122.23(b)(2). Relevant to the allegations at issue in this matter, a Medium CAFO is defined by the regulations to include an animal feeding operation with "300 to 999 cattle other than mature dairy cows or veal calves," where either of the following conditions is met:

> (A) Pollutants are discharged into waters of the United States through a man-made ditch, flushing system, or other similar man-made device; or
>
> (B) Pollutants are discharged directly into waters of the United States which originate outside of and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation.

40 C.F.R. § 122.23 (b)(6). Further, the regulations define the "production area" of an animal feeding operation as the area including "the animal confinement area, the manure storage area, the raw materials storage area, and the waste containment areas." 40 C.F.R. § 122.23(b)(8). Additionally, "process wastewater" is defined by the regulations as including "spillage or overflow from . . . washing, cleaning, or flushing pens, barns, manure pits, or other [animal feeding operation] facilities," as well as "any water which comes into contact with any raw materials, products, or byproducts including manure, litter, feed, milk, eggs or bedding." 40 C.F.R. § 122.23(b)(7).

The CWA establishes several enforcement mechanisms for violation of the prohibition against pollutant discharges in 33 U.S.C. § 1311(a), including the assessment of administrative penalties. *See* 33 U.S.C. § 1319(g)(1). For purposes of calculating administrative penalties, the CWA provides that "a single operational upset which leads to simultaneous violations of more than one pollutant parameter shall be treated as a single violation." 33 U.S.C. § 1319(g)(3).

III. BURDEN AND STANDARD OF PROOF

This proceeding is governed by the Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties and the Revocation/Termination or Suspension of Permits, set forth within 40 C.F.R. Part 22 ("Rules of Practice"), which provide that "[t]he complainant has the burdens of presentation and persuasion that the violation occurred as set forth in the complaint and that the relief sought is appropriate." 40 C.F.R. § 22.24(a). Upon a complainant establishing a prima facie case, the Rules of Practice state that the "respondent shall

[9] Pertinent to this matter, Respondents have admitted that the Riverview Facility is an animal feeding operation. *See* Compl. ¶ 21; Answer ¶ 21.

have the burden of presenting any defense to the allegations set forth in the complaint and any response or evidence with respect to the appropriate relief." 40 C.F.R. § 22.24(a). Further, with regard to any affirmative defenses, the Rules of Practice provide that "[t]he respondent has the burdens of presentation and persuasion for any affirmative defenses." 40 C.F.R. § 22.24(a).

For the parties to satisfy the established burdens of proof, the Rules of Practice provide that "[e]ach matter of controversy shall be decided by the Presiding Officer upon a preponderance of the evidence." 40 C.F.R. § 22.24(b). To prevail under this standard, a party must demonstrate that the facts it seeks to establish are more likely than not to be true. *See e.g.*, *Euclid of Va., Inc.*, 13 E.A.D. 616, 626 (EAB 2008); *Ocean State Asbestos Removal, Inc.*, 7 E.A.D. 522, 530 (EAB 1998); *Echevarria*, 5 E.A.D. 626, 638 (EAB 1994).

IV. FACTUAL BACKGROUND

a. Riverview Facility and Operations

Respondents are brothers who operate an animal feeding operation for cattle under the trade name Riverview Cattle. *See* Compl. ¶¶ 4, 21, 26; Answer ¶¶ 4, 21, 26; Tr. 33-34, 839, 988, 997; CX 1 at 1-2; CX 8 at 1-2; *see also* Tr. 702, 764, 774, 780, 795 (discussing the familial relationship between Respondents). Respondents conduct their operation in Armstrong, Iowa, at a facility ("Riverview Facility") with a street address of 1893 570th Avenue. Compl. ¶ 21; Answer ¶ 21; CX 1 at 2, 4; CX 8 at 1-2, 4. The Riverview Facility is located within the East Fork of the Des Moines River Basin, CX 1 at 4, CX 8 at 4, and the East Fork of the Des Moines River is situated south of Riverview Facility, JX 1 ¶ 2. Respondent Tony Brown is the owner of the Riverview Facility. CX 1 at 1-2; CX 8 at 1-2. Relevant to the issues in this proceeding, Respondents did not have a National Pollutant Discharge Elimination System ("NPDES") permit authorizing pollutant discharges from the Riverview Facility during the period of alleged violations. *See* Compl. ¶ 37; Answer ¶ 37.

The Riverview Facility is adjacent to a hog and cattle operation to its south, *see* CX 1 at 2; CX 8 at 2, 4; Tr. 757-59, operated under the corporate name Bacon Maker Farms, Incorporated ("Bacon Maker Facility"), Tr. 757. The Bacon Maker Facility is owned by Respondents' parents, Gary and Dawn Brown. Tr. 772.[10] The Bacon Maker Facility is also located within the East Fork of the Des Moines River Basin, and is situated to the northeast of the East Fork of the Des Moines River. *See* CX 1 at 2, 4. During the period of alleged violations, Respondents utilized an open confinement lot at the Bacon Maker Facility for certain cattle operations associated with the Riverview Facility. *See* CX 1 at 4-5; CX 4 at 1-2; CX 8 at 4. Additionally, the Riverview Facility shared certain equipment and personnel with the Bacon Maker Facility. *See* CX 1 at 5; CX 4 at 1; Tr. 813 (discussing shared equipment); Tr. 988-89 (discussing shared personnel). Nevertheless, despite maintaining some shared space, equipment, and personnel, the Riverview Facility and Bacon Maker Facility maintained separate overall operations. *See* Tr. 33-34, 144-45, 303, 756; CX 4 at 1.

[10] Although Gary Brown is identified as the sole owner of the Bacon Maker Facility in EPA reports from the 2014 and 2016 Inspections, *see* CX 1 at 1-2, 4; CX 8 at 1, he testified that this property is jointly owned with his wife, Dawn Brown, Tr. 757-58, 772.

At all times relevant to the alleged violations in this proceeding, the Riverview Facility had greater than 300 head of cattle present for 45 days or more in any 12-month period. JX 1 at ¶ 2. During the period of alleged violations, the Riverview Facility contained six concrete pens[11] for open confinement of cattle. *See* Tr. 795-99, 801, 803-05; Compl. ¶ 21; Answer ¶ 21; CX 1 at 5-6; *see also* CX 12.15; CX 12.16; CX 12.17 (aerial photographs of the Riverview Facility taken during the period of alleged violations). These concrete pens had the capacity to hold a maximum of approximately 900 to 980 cattle. *See* Compl. ¶ 21; Answer ¶ 21; Tr. 803-04.

Respondents designed and constructed the concrete pens at the Riverview Facility prior to the alleged period of violations. *See* Tr. 795-99, 801, 803-05; *see also* CX 12.1; 12.4; 12.6; 12.8; 12.13 (aerial photographs of the Riverview Facility taken prior to the alleged period of violations, depicting the concrete pens). The concrete pens at the Riverview Facility were arranged in two rows, with the first row located towards the western side of the Riverview Facility, containing pens one through four ("Pens 1-4"), numbered sequentially from north to south, and the second row located towards the eastern side of the Riverview Facility, containing pens five and six ("Pens 5-6"), numbered sequentially from south to north. *See* Tr. 795-99, 801-05 (discussing pen configuration); CX 1.6 at 4 (aerial photograph of the Riverview Facility marked by Trevor Urban to identify the location of the pens). Pen 1 was constructed with a connected gate area on its north side, resembling a rectangular passageway to which a gate was affixed at its terminal end, allowing cattle to access the pen for water. *See* Tr. 817-19; 998-99 (discussing gate area and its purpose); CX 12.5; CX 12.8; CX 12.13; CX 28.1; CX 28. 4; CX 28.5 (aerial photographs taken prior to the alleged period of violations that depict the Pen 1 gate area). In addition to the concrete pens, prior to the period of alleged violations, Respondents constructed a concrete working area and sick lot abutting Pen 4 to the south, Tr. 799-800; a concrete alleyway located centrally between the two rows of pens ("Central Alley"), Tr. 799, 801, 805; a concrete alleyway located east of Pens 5 and 6 ("Eastern Alley"), Tr. 802-03; and a concrete alleyway located north of Pen 6 ("Northern Alley"), Tr. 805-06, 1000. Further, a feedstock storage area ("Feedstock Storage Area") was established northwest of the pens at the Riverview Facility. *See* CX 1 at 5; *see also* CX 1.6 at 4 (map of Riverview Facility identifying this area). The walls of the pens and alleys were four feet in height above ground level. *See* Tr. 834 (discussing height of concrete walls at Riverview Facility); *see also* CX 20.3 (identifying height of walls in Central Alley). Notably, holes were placed in the concrete walls of the Eastern and Northern Alleys. In the Eastern Alley, a hole was constructed at the south end of the eastern wall, for purposes of draining surface water so that it would not saturate feed in that area. *See* Tr. 1006-08; CX 8 at 7. Additionally, the northern, exterior wall of the Northern Alley was constructed with two ground-level holes in the concrete, situated east and west. Tr. 822-25, 1001; *see also* CX 12.5; CX 28.1 (photographs depicting the exterior wall of the Northern Alley).

Likewise, the concrete pens at the Riverview Facility were each constructed with a hole in the wall facing the Central Alley, approximately two feet in height and two feet in width, designed to allow manure and process wastewater to convey from the pens into the Central Alley

[11] The concrete pens at the Riverview Facility are described at times in the record as "lots." *See, e.g.*, Compl. ¶ 21; CX 1 at 5-6. However, as these are walled structures, they are more specifically characterized as pens. Accordingly, for purposes of clarity, this characterization is used consistently in this document.

during pen cleaning. *See* Tr. 819-821; *see also* Tr. 424-25. For purposes of cleaning the concrete pens, Respondents, or others assisting operations at the Riverview Facility, used skid loader or payloader equipment to scrape manure from around the bedding pack material in the concrete pens and remove it. *See* Tr. 714, 734, 807, 813-14, 1001-03, 1030. The concrete pens at the Riverview Facility were scraped with an estimated frequency of one to three times weekly. *See* Tr. 807; *see also* CX 1 at 5 (discussing pen scraping "several" times a week). Additionally, Respondents also used equipment to push process wastewater from the concrete pens into the Central Alley after rainfall.[12] *See* Tr. 807-08, 819, 1002-03, 1029-30.

During the period of alleged violations, a swale area ("Swale") was located to the east of Pens 5 and 6 at the Riverview Facility. *See* Tr. 96; CX 1 at 7. The Swale was abutted on its north end by an entryway road leading to the Riverview Facility. *See* Tr. 96, 108; CX 1 at 7. Additionally, the Swale was bordered on its eastern perimeter by a land ridge extending from north to south of the Swale. *See* Tr. 96, 109. As a low-lying area, the Swale historically exhibited difficulty sustaining crop growth with rainfall, even though a tile drainage system was installed in the area to improve drainage. *See* Tr. 858. Notably, Respondent Tony Brown indicated that the Swale continued to have difficulty sustaining crop growth during the period from the summer of 2011 through the summer of 2014, even though crops were planted in this area during this time. *See* Tr. 851-53 (testimony regarding growth in Swale during this period); RX 11 at 1-3 (aerial photographs depicting vegetation in Swale from summer 2011 to summer 2014). An inlet to the subsurface tile drainage system in the Swale was located at the southern end of the Swale, adjacent and north of the road leading to the Riverview Facility. *See* CX 1 at 7; CX 1.5 at 33; *see also* CX 1.6 at 4 (map of the Riverview Facility indicating the location of this tile drain inlet). Through June 17, 2014, the tile drainage system for the inlet at the Swale traveled south, below ground, to an outlet located on the north bank of the East Fork of the Des Moines River. *See* JX 1 at ¶ 3; CX 1 at 7; *see also* CX 8.7 at 2 (map depicting the location of this tile drain outlet).

Respondents stored manure solids removed from the concrete pens in a concrete bunker ("Manure Bunker") located at the south end of the Central Alley, adjacent to Pens 4 and 5 during the period of alleged violations. *See* Tr. 806, 815; CX 1 at 5-6; CX 1.5 at 4, 34; *see also* CX 1.6 (aerial photograph of the Riverview Facility marked by Trevor Urban, identifying this area). Additionally, Respondents also stored manure solids in the Central Alley, along the walls for Pen 2 and Pen 3, Tr. 806-07, and in the Northern Alley, Tr. 826-27, 1000, 1025.

With regard to process wastewater from pens and other production areas of the Riverview Facility, prior to fall 2011, such process wastewater was maintained in the north end of the Central Alley of the Riverview Facility. *See* Tr. 805-07, 815; 830; 999-1000, 1002-03. The Central Alley was constructed with a slope of increasing elevation towards the south and lower elevation towards the north, so that process wastewater would collect at its north end. *See* Tr. 819, 999, 1019; *see also* CX 20.3 (evaluation of storage capacity of Central Alley performed by

[12] The term "squeegee" was used to describe this action of removing the process wastewater at times in testimony. *See* 807-808 (discussing use of this term in testimony).

Dr. Wang).[13] Additionally, Pen 1 was constructed with a slope of approximately six to eight inches of decreasing elevation to the south, away from its gating area, such that process wastewater would flow between the pen and the Central Alley through a hole located in the eastern wall of Pen 1, adjoining the north end of the Central Alley. *See* Tr. 819-21; 998-99; 1028-29 (discussing the slope of Pen 1 and flow of process wastewater); CX 28.1 (aerial photograph identified by Respondent Josh Brown as depicting liquid material in Pen 1); *see also* CX 20.3 (evaluating flow direction of process wastewater from the Central Alley to Pen 1).

In or around September 2011, Respondents constructed an open concrete manure pit ("Manure Pit") adjacent to, and north of, the Central Alley and Northern Alley at the Riverview Facility, to contain process wastewater. *See* Tr. 830- 33 (identifying timing of Manure Pit construction and purpose); *see also* Tr. 805-06, 939, 997 (discussing installation and purpose of manure pit); RX 1 (photograph of manure pit construction); CX 1.6 at 4 (aerial photograph of Riverview Facility marked by Trevor Urban to identify the Manure Pit). The Manure Pit was approximately 90 feet long, 45 feet wide, and eight feet deep. *See* CX 1.5 at 4, 31. It contained a gated access ramp, *see* Tr. 841-43; *see also* CX 2 at 8-9; CX 8.6 at 10 (photographs depicting gated access ramp in Manure Pit), as well as an internal concrete apron and concrete supports, *see* CX 20.2 (photograph of Manure Pit identifying these features); *see also* CX 8.6 at 10-12 (photographs of the Manure Pit depicting these features). The Manure Pit was constructed so that the top of the pit was level with the concrete pens and the Central Alley, and process wastewater would flow into the pit from these areas. *See* Tr. 844, 1028. At ground level, the Manure Pit was surrounded by a four-foot concrete wall perimeter, Tr. 844, which contained holes in its southern wall at ground level, including a square opening to the Central Alley allowing process wastewater to flow into the Manure Pit from this area, *see* CX 8.6 at 11, and a hole near the southeastern corner of the Manure Pit for purposes of providing access to move manure back into the Manure Pit after it is transferred out of the Manure Pit incidental to manure removal, *see* CX 1.5 at 31; CX 8.6 at 10, 12 (photographs depicting this hole); Tr. 843-46 (testimony from Respondent Tony Brown regarding purpose of this hole); *see also* Tr. 99-102, 268-69 (discussion of observations from Mr. Urban and Mr. Roberts regarding this hole in the Manure Pit). The hole near the southeastern corner of the Manure Pit was the same height as the gated access ramp to the Manure Pit. Tr. 845, 847, 955.

Throughout the period of alleged violations, Respondents utilized manure removal services for the Riverview Facility. Over the course of the period of alleged violations, Stephen and Joel Madden provided manure removal services to Respondents at the Riverview Facility, loading and removing predominately solid manure material from the Riverview Facility. *See* Tr. 703-08. Stephen Madden reported that such removal services were performed at the Riverview Facility after the pens are scraped, and occurred as often as three times per week. Tr. 709-10. He further indicated that prior to the installation of the Manure Pit, the manure hauled from the Riverview Facility had a wetter consistency than that hauled after the installation of the Manure Pit. *See* Tr. 720. In addition to the manure removal performed by Stephen and Joel Madden, once the Manure Pit was constructed at the Riverview Facility, Respondents employed Vaske Pumping, LLC to remove process wastewater and manure solids from the Manure Pit, and land

[13] Specifically, Dr. Wang reported that the Central Alley has a 1.5 percent slope at its north end based upon his review of LiDAR data and geospatial information for the Riverview Facility. CX 20.3

apply this material. *See* CX 1 at 5; Tr. 841, 953-54. Respondent Tony Brown testified that in order to remove process wastewater and solids from the Manure Pit, a manure pump would be backed onto the Manure Pit, and this material would be removed with a pump and agitator. *See* Tr. 841-43; *see also* CX 2 at 8-9 (photographs depicting this removal process).

b. <u>2014 Inspection of Riverview Facility</u>

On June 17, 2014, Mr. Urban and Mr. Roberts performed a CWA compliance inspection of the Riverview Facility and Bacon Maker Facility on behalf of the EPA ("2014 Inspection"). *See* Tr. 65-66, 242: CX 1 at 1; Compl. ¶ 22; Answer ¶ 22. Mr. Urban called the Bacon Maker Facility the day before the 2014 Inspection in order to provide notice of the impending inspection. Tr. 74. Following Mr. Urban's telephone call to the Bacon Maker Facility, Dawn Brown returned Mr. Urban's call and agreed to meet Mr. Urban for the inspection at 10:00 a.m. the following day. *See* Tr. 74. Relevant to the conditions at the Riverview and Bacon Maker Facilities during the 2014 Inspection, these facilities received significant rainfall prior to this inspection. *See* Tr. 760, 762, 780, 837, 992. Notably, a federal disaster declaration was made for the county in which the Riverview Facility is located, Emmet County, Iowa, related to severe storms and flooding during the period from June 14-23, 2014, including the date of the 2014 Inspection. CX 7; *see also* Tr. 1052-53 (testimony from Ms. Benson discussing this declaration).

Prior to conducting the inspection of the Riverview and Bacon Maker Facilities on June 17, 2014, Mr. Urban and Mr. Roberts met with Ms. Benson at the IDNR office in Spencer, Iowa, for purposes of obtaining more information about these facilities. *See* Tr. 69-70, 133-36. During this exchange, Mr. Urban obtained documents maintained by IDNR about the Riverview Facility, contained in CX 1.9. Tr. 70; *see also* CX 1.9; Tr. 68-69, 1035-36. Notably, on the morning of June 17, 2014, Gary Brown called Ms. Benson to ask if she could request that the EPA inspectors postpone or cancel the scheduled inspection, as he was experiencing difficulties associated with a power outage at the Bacon Maker Facility. Tr. 39-40, 1034. In her exchange with Mr. Urban and Mr. Roberts prior to the 2014 Inspection, Ms. Benson relayed Mr. Brown's request. *See* Tr. 1036. Mr. Urban declined postponing or canceling the scheduled inspection, *see* Tr. 1036, but he called the Bacon Maker Facility to advise that he would be arriving later than planned for the inspection, at approximately noon, *see* Tr. 73, 75.

Mr. Urban and Mr. Roberts arrived at the vicinity of the Riverview and Bacon Maker Facilities between approximately 12:00 p.m. and 12:15 p.m. *See* Tr.75, 993; CX 1 at 2; CX 1.16; CX 1.17 at 1; CX 47 at ¶ 4; CX 48 at ¶ 4. In advance of their announced arrival at the Riverview and Bacon Maker Facilities, Mr. Urban and Mr. Roberts drove on the gravel entryway road to the Riverview Facility, situated east-west, and stopped their vehicle to observe the Swale from the road. *See* Tr. 77, 80-82, 243-45; CX 1 at 2, 7; CX 1.6 at 2b. From their position in the vehicle, Mr. Urban and Mr. Roberts observed ponded water in the Swale and noticed that the ponded water was flowing into a perforated, orange intake pipe to the tile drain inlet in the Swale. Tr. 81-83, 120-21, 201-02, 244-45, 256, 259, 266. Mr. Urban and Mr. Roberts further observed that the ponded water in the Swale was above the grass line and encroaching onto the gravel road at that time. *See* Tr. 83-84, 244; CX 1.6 at 4b; CX 47 at ¶ 4. After viewing the Swale from their vehicle, Mr. Urban and Mr. Roberts parked at the Riverview Facility, Tr. 85, 245, and met with Respondents and Gary and Dawn Brown, Tr. 85-86; CX 1 at 2, 7.

During the course of the 2014 Inspection, Mr. Urban served as the lead investigator. Tr. 66, 71, 242; CX 47 at ¶ 2. After completing an entry briefing, Tr. 86, 245,[14] Mr. Urban obtained information from Respondents and Gary and Dawn Brown regarding operations at the Riverview and Bacon Maker Facilities, and otherwise explained the purpose of the inspection, *see* Tr. 86-89; CX 1 at 2-3, 7. Respondent Tony Brown provided Mr. Urban with daily feed records for both the Riverview Facility and Bacon Maker Facility on the date of the 2014 Inspection. *See* Tr. 865; CX 1 at 4; *see also* CX 1.7 (daily feed records supplied). Notably, Mr. Urban informed Respondents and Gary and Dawn Brown that he considered the Riverview and Bacon Maker Facilities to be a single operation based upon shared activities, and that he would be inspecting both facilities. CX 1 at 2. At some point in the conversation, Respondent Josh Brown reported that the Riverview Facility had received six inches of rain prior to the 2014 Inspection.[15] *See* Tr. 88-89, 837, 993. In his testimony, Respondent Josh Brown explained that this statement was based upon his daily observation of a rain gauge located as his house, also located in Armstrong, Iowa. *See* Tr. 990, 993; *See also* Tr. 984 (testimony from Respondent Josh Brown identifying the location of his house); Tr. 837-38, 947-48 (testimony from Respondent Tony Brown regarding this rain calculation from the rain gauge).

Upon completing this initial conversation, Mr. Urban and Mr. Roberts began their visual inspection of the Riverview and Bacon Maker Facilities by inspecting the Bacon Maker Facility. *See* Tr. 93, 245-46. Throughout the visual inspection of the Riverview and Bacon Maker Facilities during the 2014 Inspection, Mr. Urban took photographs, which he annotated and recorded in the "photo log" in CX 1.5. *See* Tr. 89-93; CX 1.5. After performing the visual inspection of the Bacon Maker Facility, Mr. Urban and Mr. Roberts returned to the Riverview Facility to conduct their visual inspection of this property, after 3:00 p.m. *See* Tr. 95, 246, 248. Respondents were present while Mr. Urban and Mr. Roberts conducted the visual inspection of the Riverview Facility. *See* CX 1 at 3; Tr. 843.

At the Riverview Facility, Mr. Urban observed process wastewater flowing from the pens and Manure Bunker into the Manure Pit. *See* Tr. 96-98, 224; CX 1.5 at 4, 34. Additionally, Mr. Urban and Mr. Roberts observed process wastewater and manure solids overflowing from the hole in the concrete wall of the Manure Pit near its southeastern corner, flowing east into a field area and then traveling south to the Swale. *See* Tr. 97, 99-109, 112-13, 222-23, 267-69; CX 1 at 7; CX 1.5 at 4, 31-33; CX 1.17 at 6; CX 47 at ¶ 4; CX 48 at ¶ 4.[16] Mr. Urban also observed process wastewater present in the Feedstock Storage Area of the Riverview Facility during the visual inspection. *See* Tr. 98, 110-11; CX 1.5 at 4, 35, 36. Notably, based upon his observations regarding the flow of such process wastewater at the Riverview Facility during the 2014 Inspection, Mr. Urban marked an aerial photograph of the Riverview Facility as a map in CX 1.6

[14] Mr. Urban described the content of such inspection entry briefings in his testimony. *See* Tr. 75-76.

[15] Notably, Mr. Urban reported that Respondent Tony Brown made this statement, Tr. 88-89, but Respondents testified that it was Respondent Josh Brown who provided this information, Tr. 837, 993.

[16] In CX 47 and CX 48, Mr. Urban and Mr. Roberts identified the hole in the Manure Pit wall as being southwestern, CX 47 at ¶ 4; CX 48 at ¶ 4, but Mr. Urban clarified in his testimony that this notation is in error and that the referenced hole in the Manure pit is actually southeastern, Tr. 101-02.

at 4, and on this map, and he illustrated the direction in which he observed process wastewater flowing with red arrows. *See* Tr. 96-98; CX 1.6 at 4.

After viewing these areas of the Riverview Facility, Mr. Urban and Mr. Roberts left the Riverview Facility to observe off-site manure stockpiles. *See* Tr. 112-13, 246; CX 1.6 at 1. Mr. Urban and Mr. Roberts then traveled to the 200th Street Bridge with Respondent Tony Brown, a location on the East Fork of the Des Moines River approximately one mile downstream from the Riverview Facility, where Mr. Urban took photographs of the view of the East Fork of the Des Moines River from both sides of the bridge. *See* Tr. 113-15, 246-47; CX 1 at 12; CX 1.5 at 39-40; CX 1.6 at 1. While taking these photographs, Mr. Urban observed that the river appeared to be at the top of the riverbank, and he noticed that tree branches were touching the surface of the water. *See* Tr. 114; CX 1.5 at 39-40.

Mr. Urban and Mr. Roberts then returned to the Riverview Facility to complete their visual inspection and perform sampling. *See* Tr. 115. Upon their return to the Riverview Facility, Mr. Urban and Mr. Roberts went to the Swale to photograph this area and perform additional observations. *See* Tr. 115-18; 122-25; CX 1.5 at 41-42. Notably, Respondents were present while Mr. Urban and Mr. Roberts were photographing the Swale, and were also present for subsequent sample collection at the Swale. *See* Tr. 857, 993. While photographing the area of the Swale, at approximately 4:50 p.m., Mr. Urban noticed that the water in the Swale, which he had previously seen encroaching the gravel road upon his arrival, had receded into the grass area. *See* Tr. 123-24. Mr. Urban estimated that the Swale was approximately 60 to 80 feet wide upon his observation. *See* Tr. 108.

At the point of this visual inspection, Mr. Urban again observed process wastewater in the Swale flowing into the orange intake pipe of the tile drain inlet. *See* Tr. 119-20, 124, 128-29; CX 1 at 7; CX 1.17 at 6; CX 47 at ¶ 4; *see also* Compl. ¶¶ 23, 28; Answer ¶¶ 23, 28. Mr. Urban further observed that the water in the Swale had an appearance consistent with process wastewater and an odor of manure. Tr. 125; *see also* CX 1.14 at 2 (notes from Mr. Urban reflecting that water sampled from the Swale was brown and had the odor of manure). Mr. Urban and Mr. Roberts observed that the orange intake pipe to the tile drain inlet was perforated with numerous drain holes of approximately one-inch diameter surrounding the exterior. *See* Tr. 119-20, 124, 128-30, 244-45. Mr. Urban estimated that the intake pipe to the inlet was approximately eight inches in diameter. Tr. 129.

After photographing the Swale, Mr. Urban and Mr. Roberts left the Riverview Facility to obtain ice to maintain their water samples, *see* Tr. 116, 125, 865, and then returned to the Swale to collect Sample 1 of the 2014 Inspection at the tile drain inlet, s*ee* Tr. 116, 126-28, 251-52; CX 1 at 11; *see also* CX 1.6 at 4 (map of the Riverview Facility depicting location of Sample 1). Specifically, for Sample 1, Mr. Urban collected water samples, contained in four one-liter bottles and a 100-milliliter sample bottle, approximately six to eight inches from the orange intake pipe to the tile drain inlet at the Swale, between the orange intake pipe and a black marker pipe at the Swale. Tr. 126-28; *see also* CX 1.5 at 41-42 (photographs from the 2014 Inspection identifying location where Sample 1 was collected). While collecting Sample 1, Mr. Urban noticed seeds on the surface of the water at the Swale, and he observed that these seeds were moving in the direction of the intake pipe of the inlet at approximately two to three inches per second. Tr. 120,

128, 205-07; CX 47 at ¶ 4. Mr. Urban also reported that he also observed the appearance of water from the Swale being pulled into the intake pipe. S*ee* Tr. 124, 129. Additionally, both Mr. Urban and Mr. Roberts reported that they heard sound of water flowing into the intake pipe while at the location of the tile drain inlet during the 2014 Inspection. Tr. 124, 260; CX 47 at ¶ 4; CX 48 at ¶ 4. In contrast, however, both Respondent Tony Brown and Respondent Josh Brown indicated that they did not hear sound from water flowing into the intake pipe while at the Swale during the 2014 Inspection. *See* Tr. 857, 995.

Notably, Mr. Roberts reported that he noticed that at the time Mr. Urban was collecting Sample 1, the water in the Swale had receded from the level at the road where it had been upon his arrival at the Riverview Facility, but that the water line was still above the intake pipe for the tile drain inlet. Tr. 252, 258-59; CX 48 at ¶ 4. Both Mr. Urban and Mr. Roberts observed that the process wastewater was still flowing into the intake pipe to the inlet of the tile drainage system during sampling. CX 47 at ¶ 4; CX 48 at ¶ 4. Following collection of Sample 1, Mr. Urban and Mr. Roberts collected water samples from two locations at the Bacon Maker Facility (Samples 2-3). *See* Tr. 134; CX 1 at 11.

During the 2014 Inspection, Mr. Urban and Mr. Roberts asked Respondents about the location of the outlet of the tile drainage system for the Riverview Facility, *see* Tr. 135, 247, 254, but did not collect samples at the outlet of the tile drainage system for the Riverview Facility, *see* Tr. 136. Respondents testified that they reported that the tile drain outlet was located to the South, at the East Fork of the Des Moines River, during the 2014 Inspection.[17] *See* Tr. 861, 962. However, Respondents and Gary and Dawn Brown reported that Mr. Urban had commented that he was "too fat and lazy" to obtain samples from the outlet of the tile drainage system near the East Fork of the Des Moines River during the 2014 Inspection. *See* Tr. 764, 783, 864, 995. Additionally, Respondents asserted that Mr. Urban expressed general reluctance to collect samples during the 2014 Inspection. *See* Tr. 859-60, 864, 995-96. Mr. Urban acknowledged making a comment with regard to his weight to relieve tension during another portion of the 2014 Inspection, but otherwise denied stating that he was too fat and lazy to collect samples from the outlet of the tile drainage system. *See* Tr. 231-33. Instead, he reported that there were multiple reasons why a sample was not collected at the tile drain outlet, including the fact that the location of the outlet was unknown, concern regarding the need to traverse property not owned by Respondents to seek the location of the outlet, concern for limited remaining daylight to complete the inspection, concern regarding sample holding times being exceeded by continuing the inspection, and safety concerns given the wet conditions during the 2014 Inspection. *See* Tr. 136-39, 141, 191, 193-94, 212. Likewise, in his testimony, Mr. Roberts expressed his opinion that the wet conditions at the Riverview Facility during the inspection made if unsafe to obtain a sample from the tile drain outlet, *see* Tr. 263, and he denied that Mr. Urban was hesitant to collect samples during the 2014 Inspection, Tr. 266. Mr. Roberts further described an incident during the 2014 Inspection in which his boot was stuck in mud and partially removed from his foot due to the wet conditions, while he was collecting samples at the Bacon Maker Facility. *See* Tr. 248, 261-62, 274.

[17] Notably, both Mr. Urban and Mr. Roberts reported that Respondents indicated that they were not certain where the outlet to the tile drainage system for the Riverview Facility was located. *See* Tr. 135-37, 191, 247, 254; CX 47 at ¶ 8; CX 48 at ¶ 9.

After collecting water samples, Mr. Urban conducted an exit briefing with Respondents. *See* Tr. 143; CX 1 at 3; CX 1.16. Mr. Urban reported that over the course of the 2014 Inspection he communicated to Respondents his belief that they were in violation of the law for discharging process wastewater into the inlet to the tile drainage system. *See* Tr. 143-45; *see also* CX 47 at ¶ 5; CX 48 at ¶ 6. In his exit briefing, Mr. Urban advised Respondents to discontinue discharging to the tile drain inlet, and specifically suggested that they place a sleeve over the intake pipe to the tile drain inlet to block it. Tr. 146. He further advised them that they should take a photograph to evidence that they had discontinued drainage to the tile drain inlet. *See* Tr. 146. Mr. Urban issued Gary Brown a Notice of Potential Violation, directed to the Bacon Maker Facility, for an unlawful discharge to the East Fork of the Des Moines River from the Riverview Facility, based upon the observed process wastewater draining into the inlet to the tile drainage system.[18] *See* Tr. 146, 194-95, 962-63; CX 1 at 7, 12 ; CX 1.14; CX 1.16. After concluding the exit briefing, Mr. Urban and Mr. Roberts departed the Riverview Facility at approximately 7:30 p.m. *See* Tr. 143, 148. Mr. Urban and Mr. Roberts then drove to a testing laboratory in Sioux City, Iowa to deposit the water samples from the 2014 Inspection, which they relinquished at 11:15 p.m. *See* Tr. 150-51, 2249, 255.

The day following the 2014 Inspection, Respondents blocked the orange intake pipe to the inlet of the tile drainage system at the Riverview Facility, by placing a plastic tube around the intake pipe to sleeve it. *See* Tr. 855-65, 860, 963; *see also* CX 2 at 3 (photograph of the blocked intake pipe). Additionally, Respondents had the Manure Pit of the Riverview Facility pumped the day following the 2014 Inspection. *See* Tr. 841-43; CX 2 at 8-9. On the same date, Respondent Tony Brown also emailed Mr. Urban to convey photographs of the work performed the day following the 2014 Inspection at the Riverview Facility, including sleeving the intake pipe and pumping the manure pit, which are contained in CX 2. S*ee* Tr. 152-56, 855-56; CX 2; CX 4 at 2. These photographs included a photograph of the sleeved intake pipe to the inlet of the tile drainage system at the Swale, taken the day following the 2014 Inspection. *See* Tr. 154-56; 855-56 (testimony regarding this photograph); CX 2 at 3 (photograph of the sleeved intake pipe). Likewise, Respondent Tony Brown provided Mr. Urban with a map of the tile drainage system at the Riverview Facility, in CX 1.10 at 3, in email communications subsequent to the 2014 Inspection.[19] *See* Tr. 152, 891-96; CX 1 at 7; CX 1.10 at 2-3.

Additionally, following the inspection, on July 1, 2014, Mr. Urban obtained the water quality testing reports for the water samples collected at the Riverview Facility. *See* CX 1.14 at 1. Mr. Urban noted that the results of Sample 1 demonstrated "elevated levels of pollutants," including very high levels of ammoniacal nitrogen, total kjeldahl nitrogen, biological oxygen demand, chloride, total phosphorus, and E. coli levels. CX 1 at 11. The laboratory test results reflected an E. coli count of 4,110,000 for Sample 1. CX 1 at 11; CX 1.14 at 1. After receiving the test results, Mr. Urban completed his report of the 2014 Inspection, contained in CX 1, on November 18, 2014. *See* Tr. 183-84; CX 1 at 14. Based upon the findings of the 2014

[18] Presumptively, this Notice of Violation associated with the Riverview Facility was issued to Gary Brown and directed to the Bacon Maker Facility due to Mr. Urban's belief that these two facilities were one operation. *See* CX 1 at 2, 6, 12 (statements in inspection report from Mr. Urban reflecting this position).

[19] Notably, although CX 1.10 contains multiple maps of the tile drainage system at the Riverview Facility, Respondent Tony Brown clarified that he only provided the map in CX 1.10 at 3. Tr. 891-96.

Inspection, Complainant issued Respondents an Administrative Order on May 14, 2015, which directed them to take action to comply with the CWA, including ceasing all unpermitted discharges. *See* CX 6; *see also* Compl. ¶ 33, Answer ¶ 33.[20]

Following the 2014 Inspection and prior to the 2015 Compliance Order, Respondents installed a culvert in the area of the Swale in March 2015, so that runoff accumulating in the Swale area would be directed into the culvert underneath the road leading to the Riverview Facility. *See* Tr. 373-75, 388, 434-35, 886, 890-91; CX 5 at 2-5; *see also* CX 12.34 (aerial photograph of the Riverview Facility depicting culvert, taken March 22, 2016); CX 8 at 7 (noting construction of culvert at time of 2016 Inspection); CX 8.6 at 18 (photograph of culvert at Swale during the 2016 Inspection). Notably, Mr. Draper was informed of this development at the Riverview Facility in March 2015. *See* CX 5.

c. <u>2016 Inspection of Riverview Facility</u>

On March 29, 2016, and March 30, 2016, Mr. Urban and Mr. Draper conducted a second CWA compliance inspection of the Riverview and Bacon Maker Facilities on behalf of the EPA ("2016 Inspection"), accompanied by Ms. Benson. *See* Tr. 65-66, 158-60, 375, 872-73; CX 8 at 1; Compl. ¶ 22; Answer ¶ 22. The purpose of the 2016 Inspection was to obtain information regarding the facilities that was not collected during the 2014 Inspection, including information regarding the outlet to the tile drainage system at the Riverview Facility. *See* Tr. 160; CX 8 at 2. Additionally, Mr. Draper reported that the 2016 Inspection was an opportunity for him to view the Riverview Facility in person. *See* Tr. 378. Mr. Urban served as the lead inspector for the 2016 Inspection, Tr. 66; CX 8 at 1, and he again took photographs during the inspection, which he annotated and recorded in the "photo log" in CX 8.6, *see* Tr.159; CX 8.6. Likewise, Mr. Urban also prepared the report for the 2016 Inspection in CX 8, *see* Tr. 67; CX 8, and a map of the Riverview Facility identifying the locations of photographs and samples collected during the 2016 Inspection in CX 8.7 at 3, *see* Tr. 159-60; CX 8.7 at 3.

On the first day of the 2016 Inspection, March 29, 2016, Mr. Urban and Mr. Draper performed a visual inspection of the Riverview and Bacon Maker Facilities, and further observed the outlet of the tile drainage system for the Riverview Facility from which water entering the tile drain inlet in the Swale at the time of the 2014 Inspection would have exited. *See* CX 8 at 2, 7-11; Tr. 160, 171-75, 377, 380-84, 400-07, 873-74. During the visual inspection of the facilities, Respondents and Gary and Dawn Brown were present. CX 8 at 2, 7; Tr. 377, 873. At the time of the 2016 Inspection, Mr. Urban and Mr. Draper observed that Respondents had plugged the tile drain inlet at the Swale location below the ground level, *see* CX 8 at 7; Tr. 160-61, 396-97; *see also* CX 8.6 at 19-20 (photographs of plugged tile inlet), and otherwise had installed the culvert in the Swale area, discussed above, *see* Tr. 160-61, 374, 388; CX 8 at 7-8; CX 8.6 at 6, 18. As a result, runoff to the Swale area no longer entered the inlet to the tile

[20] Although the Complaint and Answer indicated that this document was issued on May 15, 2015, the Administrative Order and accompanying documents reflect that this was issued on May 14, 2015.

drainage system, and instead traveled underneath the road leading to the Riverview Facility into cropland on the other side of the road.[21] *See* Tr. 394-97; CX 8 at 6-8.

After visual inspections of the Riverview and Bacon Maker Facilities on the first day of the 2016 Inspection, Mr. Urban and Mr. Draper went to locate the tile drain outlet for the inlet located at the Swale during the 2014 Inspection along the East Fork of the Des Moines River. *See* Tr. 171-75, 400-07; CX 8 at 2, 7. Mr. Urban and Mr. Draper explained that unlike the circumstances in the 2014 Inspection, they were able to access the land between the tile drain inlet and tile drain outlet, owned by another party, as Respondents were leasing this property from the owner at the time of the 2016 Inspection. *See* Tr. 171, 401. Respondent Tony Brown accompanied Mr. Urban and Mr. Draper during their visual inspection for the tile drainage outlet. *See* Tr. 171, 874; CX 8 at 2.

Walking along the area near the riverbank for the East Fork of the Des Moines River, Mr. Urban and Mr. Draper were able to locate the tile drain outlet for the inlet located at the Swale during the 2014 Inspection as one of two tile drain outlets at a location near a tree cluster, south of the Riverview and Bacon Maker Facilities. *See* Tr. 171-75, 400-03; CX 8 at 9; *see also* CX 8.6 at 38-40 (photographs of this location). Based upon the tile drainage system maps for the local area, including the tile drainage system map in CX 1.10 at 4, Mr. Urban and Mr. Draper were able to ascertain that the left pipe, as photographed in CX 8.6 at 39, consisting of black plastic tubing, was the tile drain outlet for the inlet located at the Swale during the 2014 Inspection. *See* Tr. 174-75, 404-06. Mr. Urban and Mr. Draper determined that the outlet to the tile drainage system was located approximately 40 yards away from the banks of the East Fork of the Des Moines River. Tr. 175, 406; CX 8 at 9; *see also* CX 8.6 at 37- 40 (noting this distance between the tile drain outlet and the river). Additionally, Mr. Urban and Mr. Draper observed that the tile drain outlet was approximately five to six feet in elevation above the banks of the East Fork of the Des Moines River. *See* Tr. 175, 406-07; CX 8 at 9; CX 8.6 at 38. At the time of their observation, Mr. Urban and Mr. Draper saw that the tile drain outlet for the inlet located at the Swale during the 2014 Inspection was not submerged, *see* Tr. 175, 406-07, and was otherwise discharging water south into the East Fork of the Des Moines River during the 2016 Inspection, *see* CX 8 at 9; Tr. 406; CX 8.6 at 38-40.

After locating the tile drain outlet, Mr. Urban and Mr. Draper additionally observed the East Fork of the Des Moines River from the 200th Street Bridge on the first day of the 2016 Inspection. *See* Tr. 175-76, 407; CX 8.6 at 52-53. Mr. Urban estimated that the East Fork of the Des Moines River was approximately two feet away from the top of the riverbank where he observed the height of the river during the 2014 Inspection. *See* Tr. 176; CX 8 at 9; CX 8.6 at 52-53. Mr. Urban concluded from his observations that the tile drain outlet would not have been submerged during the 2014 Inspection, given his observation that the outlet was not submerged during the 2016 Inspection, his findings regarding the elevation of the tile drain outlet compared to the East Fork of the Des Moines River, and his estimation that the river was approximately two feet higher during the 2014 Inspection. *See* Tr. 176-77; CX 8 at 9.

[21] In addition to these changes, Mr. Urban reported that the hole in the south end of the eastern wall of the Eastern Alley was enlarged as of the 2016 Inspection, *see* Tr. 161-62, and this enlargement was acknowledged by Respondent Josh Brown in his testimony, *see* Tr. 1006-08.

On the second day of inspection, March 30, 2016, Mr. Urban, Mr. Draper, and Ms. Benson returned to the Riverview Facility in the morning, following .70 tenths of an inch of rain, to make observations and collect water samples. *See* CX 8 at 3; Tr. 160, 168; 384-86. Notably, Mr. Urban and Mr. Draper observed the Manure Pit at the Riverview Facility on both days of the 2016 Inspection. *See* CX 8 at 7-8; Tr. 165, 385, 445-46; CX 8.6 at 1, 10-12, 54. With regard to the schedule for servicing the Manure Pit, Respondent Tony Brown reported during the 2016 Inspection that the Manure Pit is emptied and applied to land after each hay cutting cycle, totaling five to six times a year. CX 8 at 6. On the first day of the 2016 Inspection, Mr Urban estimated that there was approximately 26 inches of free board space in the Manure Pit, and noted that Respondent Tony Brown had informed him the Manure Pit had not been dewatered since November 2015, but had not discharged. CX 8 at 7-8. The following day, Mr. Urban observed that the Manure Pit had approximately 36 inches of free board space, and Respondent Tony Brown reported that 13 tanker loads of material had been removed from the pit the prior day after Mr. Urban's departure. CX 8 at 8. Accordingly, Mr. Urban reported that the Manure Pit did not discharge on either day of the 2016 Inspection. Tr. 165.

Although, Mr. Urban and Mr. Draper did not observe process wastewater overflow from the Manure Pit during the 2016 Inspection, they nevertheless reported observing process wastewater flow from the Riverview Facility into the Swale area, where the culvert had been installed, on the second day of the 2016 Inspection. *See* Tr. 163-67, 170-71, 384-88; CX 8 at 6, 8, 13-14; CX 8.6 at 7, 57. Specifically, they reported observing process wastewater and manure solids flow from the Eastern and Northern Alleys of the Riverview Facility to the field located east, passing through and around hay bales in the field, before flowing into the Swale area and traveling south under the road leading to Riverview Facility through the culvert constructed in this area. *See* Tr. 164-66, 387; CX 8 at 6, 8, 14; CX 8. 6 at 7, 58. As the process wastewater traveled south through the culvert under the road leading to the Riverview Facility, Mr. Urban and Mr. Draper observed it mix with additional rainwater runoff from crop fields. *See* Tr. 165-66, 386-87; CX 8 at 6, 8, 14; CX 8. 6 at 7, 58. From his observations regarding this flow of process wastewater, Mr. Draper determined that there were areas of the Riverview Facility where process wastewater was not captured by the Manure Pit and flowed into the Swale, and based upon his review of aerial photographs of the Riverview Facility, he concluded that this pathway for process wastewater existed during the period from 2011 to 2014. *See* Tr. 384, 390.

Mr. Urban and Mr. Draper collected nine water samples from the Riverview and Bacon Maker Facilities and tile drain outlet locations for these facilities during the 2016 Inspection on the second day of this inspection.[22] *See* CX 8 at 3-4, 11-13. Of these samples, Sample 3 was taken from the process wastewater observed flowing from the Riverview Facility east, through and around hay bales located in the field, towards the Swale area. *See* Tr. 387; CX 8 at 12, 14; CX 8.6 at 57; *see also* CX 8.7 at 2-3 (identifying the location where Sample 3 was collected). Likewise, Sample 4 was collected of process wastewater from the Riverview Facility mixed with rainwater runoff from cropland as it exited the south end of the culvert underneath the road leading to the Riverview Facility. *See* Tr. 161, 387-88, 886; CX 8 at 12, 14; CX 8. 6 at 58; *see*

[22] Notably, Sample 9 from the 2016 Inspection was collected at the tile drain outlet for the inlet located at the Swale during the 2014 Inspection. *See* Tr. 174-75; CX 8 at 12, 14. However, as previously discussed, the tile drain inlet at the Swale observed during the 2014 Inspection had been plugged prior to the 2016 Inspection. *See* CX 8 at 7; Tr. 160-61, 396-97; CX 8.6 at 19-20.

also CX 8.7 at 2-3 (identifying the location where Sample 4 was collected). Following the 2016 Inspection, Mr. Urban reported that water quality test results for the collected samples revealed that Samples 3 and 4 contained elevated levels of E. coli, chloride, ammoniacal nitrogen, total kjeldahl nitrogen, total phosphorous, total suspended solids, and biological oxygen demand. *See* CX 8 at 12, 14; *see also* CX 8.13 at 7-12 (test results for Samples 3 and 4 from the 2016 Inspection). Specifically, testing results revealed that Sample 3 had an E. coli count of 160,000, CX 8.6 at 12; CX 8.13 at 7, and Sample 4 had an E. coli count of 8,200, CX 8.6 at 12; CX 8.13 at 10. However, as the process wastewater from the Riverview Facility was not observed to discharge to the East Fork of the Des Moines River during the 2016 Inspection, Respondents were not issued a Notice of Violation during this inspection. *See* Tr. 394-95, 397; CX 8 at 13-14.

Following the 2016 Inspection, Respondents continued construction on the Riverview Facility. *See* Tr. 410-14, 904-11, 1048-49, 1088-90; CX 51; *see also* CX 12.43; CX 12.44; CX 12.45; RX 13 (photographs of construction at the Riverview Facility following the 2016 Inspection); CX 55.1 at 32; CX 55.2 at 2 (site plan for building construction at the Riverview Facility). Specifically, in 2016, following the 2016 Inspection, Respondents covered Pens 5 and 6, *see* Tr. 411, 910-11, 1089-90; constructed a deep-pit cattle barn with additional manure storage to the east of the Eastern Alley, *see* Tr. 410, 908, 1048-49, 1088; CX 51 at 1, 3-4; *see also* CX 12.44; CX 12.45; RX 13 (photographs depicting this building construction); CX 55.1 at 32; CX 55.2 at 2 (site plan for this construction); enlarged the capacity of the Manure Pit, *see* Tr. 1048-49, CX 51 at 1-2; and developed a parking area in the area of the Swale, *see* Tr. 411. During this construction at the Riverview Facility, Respondents capped the tile drain inlet in the Swale at the tile level, below ground, as they were regrading the area of the inlet. *See* Tr. 890.

Additionally, at some point in 2016, Respondents installed new tile line to receive runoff from gutters of the covered pens at the Riverview Facility in 2016, and in the process, removed a portion of older tile line from the tile drainage system. *See* Tr. 412-14, 904-11, 1023; *see also* RX 31 (map depicting installed tile line). Notably, when removing this portion of the tile line in the tile drainage system at the Riverview Facility, Respondent Tony Brown observed the presence of sediment in the removed tile line, as depicted in photographs of this tile line contained in RX 32 and RX 33. *See* Tr. 904-05, 908 (testimony regarding these photographs); *see also* RX 32; RX 33 (photographs of removed tile line). Respondent Tony Brown, however, acknowledged in his testimony that these photographs did not show that the tile line was entirely obstructed. *See* Tr. 908.

Notably, in the year following the 2016 Inspection, Ms. Benson performed an unannounced site visit of the Riverview Facility during a rain event at EPA's request on April 19, 2017 ("April 2017 Site Visit"). *See* CX 52; Tr. 1050-52. Ms. Benson reported that she observed manure and runoff from the Riverview Facility flow into the Manure Pit during this visit. *See* Tr. 1051-52, CX 52 at 1, 4.

d. Complainant's Modeling Evidence and Respondents' Expert Evidence

i. Complainant's Modeling Evidence

During the course of litigation of this matter, Dr. Wang conducted a hydrological assessment of the Riverview Facility over the period from 2011 through 2014 on behalf of Complainant, employing hydrological modeling techniques for purposes of determining upon which dates process wastewater runoff from the Riverview Facility discharged to the East Fork of the Des Moines River over this period. *See* CX 20;[23] CX 20.1; CX 20.2; CX 20.3; CX 44; CX 45 (reports and addendums discussing Dr. Wang's assessment). Dr. Wang's model-based hydrological assessment, herein identified as "Complainant's Modeling Evidence," is discussed in his report dated January 6, 2017, contained in CX 20, and several report addendums contained in CX 20.1, CX 20.2, CX 20.3, CX 44, and CX 45. Dr. Wang characterized his approach in Complainant's Modeling Evidence as conservative, meaning that as he was modeling the conditions at the Riverview Facility, he intentionally applied inputs and calculations that were premised on the actual conditions but would be less likely to result in modeling discharges, in favor of Respondents. *See* Tr. 560, 568-69, 571-72, 618 (discussing Dr. Wang's modeling approach). Consistently, Dr. Wang limited his modeling of discharges from the Riverview Facility in Complainant's Modeling Evidence to the months of April through October during the period from 2011 through 2014, excluding the months of November through March from his calculations. Tr. 560-61.

In Complainant's Modeling Evidence, Dr. Wang used two hydrological models to calculate the dates upon which process wastewater runoff from the Riverview Facility discharged into the East Fork of Des Moines River: the HEC-RAS hydraulic model ("HEC-RAS Model") developed by the United States Army Corps of Engineers, and the Runoff Curve Number Hydrologic Method ("Curve Number Method") developed by Natural Resources Conservation Service ("NRCS") of the United Stated Department of Agriculture. *See* CX 20 at 4-5, 7-9; Tr. 530-31, 561, 572-73. More specifically, Dr. Wang used these models to calculate the dates upon which process wastewater from the Riverview Facility flowed into the Swale and then flowed from the Swale through the tile drainage system and into the East Fork of the Des Moines River. *See* CX 20 at 5; Tr. 553-54. In applying these two models for this purpose in Complainant's Modeling Evidence, Dr. Wang reported that he calibrated the models to site-specific conditions at the Riverview Facility during the relevant period, as discussed in greater detail below. *See infra* at 19-28; Tr. 570, 584; *see also* CX 20 at 8-10; CX 20.1 at 1-2; CX 20.2 at 1 (describing model calibration to conditions at the Riverview Facility).

Further, in addition to his modeling involving the HEC-RAS Model and the Curve Number Method, Dr. Wang performed a flow analysis for runoff in the tile drainage system to determine whether runoff entering the tile drain inlet, as modeled, discharged into the East Fork of the Des Moines River. *See* CX 44; CX 45; Tr. 624-26, 631-37. Dr. Wang further performed calculations to evaluate the fate and transport of E. coli bacteria in runoff traveling from the inlet

[23] As acknowledged by Dr. Wang in his testimony, the figures appended to his report in CX 20 were misnumbered such that his references to these figures in the text of the report do not match the actual numbers of the appended figures. *See* Tr. 557-58; *see also* CX 20 at 19-31 (appended Figures). For purposes of clarity, references to the figures appended to Dr. Wang's report in CX 20 are identified as they are numbered in the document at pages 19-31.

of the tile drainage system at the Swale to the tile drain outlet. *See* CX 20.1 at 3-4. As with his HEC-RAS and Curve Number Method modeling in Complainant's Modeling Evidence, Dr. Wang applied data calibrated to the Riverview Facility's tile drainage system for such analysis. *See* CX 20.1 at 3-4; CX 44; CX 45; Tr. 624-26, 631-37.

Dr. Wang reported that his results from Complainant's Modeling Evidence were reviewed by other expert modelers within EPA for purposes of quality review, and his work satisfied this review. *See* Tr. 623. Additionally, as discussed further below, Dr. Wang performed a site visit of the Riverview Facility in April 2018, in order to evaluate his model inputs and his calibration of modeling in the Complainant's Modeling Evidence to conditions at the Riverview Facility. *See* Tr. 418, 629, 633, 670.

A. HEC-RAS Modeling

As noted, Dr. Wang employed the HEC-RAS Model in Complainant's Modeling Evidence. The HEC-RAS Model is a hydraulic model designed to conduct flow analysis which can be used to model surface water movement in a watershed.[24] CX 20 at 7-8; *see also* Tr. 572-73 (testimony from Dr. Wang discussing the HEC-RAS Model). Within Complainant's Modeling Evidence, the HEC-RAS Model was employed by Dr. Wang for purposes of modeling the flow of process wastewater runoff from the Riverview Facility to the Swale, and further, in conjunction with the Curve Number Method, to calculate the volume of runoff contributed to the Swale. Tr. 572-73, 575; CX 20 at 8, 10. The HEC-RAS model requires use of site-specific parameters regarding hourly precipitation, elevation data, and land use (considered in utilizing Manning's surface roughness coefficient values, discussed below). CX 20 at 8; *see also* Tr. 582-83 (discussing certain parameters in the HEC-RAS Model and Manning's surface roughness coefficient values). As a result, Dr. Wang calibrated the HEC-RAS Model to the conditions at the Riverview Facility in Complainant's Modeling Evidence by applying such site-specific parameters for the Riverview Facility. *See* CX 20 at 8 (discussing such calibration).

For purposes of applying hourly precipitation data for the Riverview Facility in the HEC-RAS modeling, Dr. Wang utilized hourly precipitation data from a North American Land Data Assimilations System ("NLDAS") radar rainfall site maintained by the National Aeronautics and Space Administration in Swea City, Iowa, located approximately 4.5 miles southeast of the Riverview Facility. CX 20 at 6-8; *see also* Tr. 582-83, 587 (discussing use of this data in the HEC-RAS Model); CX 20 at 26 (Figure 10(a), showing such radar precipitation data from 2000 to 2015); CX 20.2 at 5 (map depicting proximity of NLDAS radar rainfall site to Riverview Facility). Dr. Wang explained that he selected data from this radar rainfall site on the basis of the site's proximity to the Riverview Facility and the availability of the hourly rainfall data from this site. Tr. 585, 587. With regard to elevation data for use in the HEC-RAS Model, Dr. Wang utilized light detection and ranging ("LiDAR") imaging data for the Riverview Facility obtained from the University of Northern Iowa for his calculations. CX 20 at 8, Tr. 577-79, 582; *see also* CX 20 at 28 (Figure 13(a), depicting LiDAR imaging of the modeled watershed area

[24] Notably, in addition to the calculations regarding infiltration discussed below with regard to the Curve Number Method modeling, the HEC-RAS Model also accounts for infiltration. *See* Tr. 618, 648.

encompassing the Riverview Facility).[25] In describing the reason he chose to utilize this LiDAR data for purposes of determining elevation of the Riverview Facility for use in the HEC-RAS Model, Dr. Wang reported that it was the most detailed and recent surface elevation information available.[26] Tr. 577, 579. Finally, for purposes of accounting for land use at the Riverview Facility in the HEC-RAS Model, Dr. Wang analyzed the land use conditions based upon Cropland Data Layer information from the National Agricultural Statistics Service of the United States Department of Agriculture for the Riverview Facility and aerial photography of the Riverview Facility before and after the construction of the Manure Pit.[27] *See* CX 20 at 5, 8, 13; CX 20.3. Based upon this assessment, Dr. Wang applied applicable Manning's surface roughness coefficient variables that corresponded to the land use at the Riverview Facility. CX 20 at 8, 15 (Table 2)[28]; Tr. 583.

Using the aforementioned parameters within the HEC-RAS Model, Dr. Wang identified the watershed area contributing runoff to the Swale, including the areas of the Riverview Facility contributing process wastewater runoff to the Swale, and he further employed this information within his Curve Number Method modeling, discussed below, to calculate the volume of runoff in the Swale. Tr. 575-76; CX 20 at 8. Based upon his evaluation, Dr. Wang concluded that approximately 95 percent of the runoff from the Riverview Facility was directed to the Manure Pit once it was constructed, with the remaining portion of runoff of approximately five percent bypassing the Manure Pit, and flowing from the Feedstock Storage Area, Northern Alley, and Eastern Alley directly into the Swale. CX 20 at 4-5, 8, 11; Tr. 553-56, 652-55; *see also* CX 20 at 19 (Figure 1, depicting an aerial photograph of the Riverview Facility after construction of the Manure Pit marked to identify runoff flow pathways). Dr. Wang noted that in circumstances where the runoff received by the Manure Pit exceeded its capacity, the runoff would flow out of the ground-level concrete holes of the Manure Pit wall into the Swale. CX 20 at 5. For the period prior to the construction of the Manure Pit, Dr. Wang determined that runoff from the Riverview Facility flowed to the north end of the Central Alley, and that when this runoff exceeded the capacity of this area it flowed into Pen 1 and then through the gate area of Pen 1 into the Swale. *See* CX 20.3.

For purposes of validating the results of his HEC-RAS modeling finding that runoff from the Riverview Facility flowed to the Swale, Dr. Wang compared this modeling for the dates of June 16-17, 2014, with the conditions reported in the 2014 Inspection on June 17, 2014. *See* CX 20 at 8, 10; Tr. 575-76; *see also* CX 20 at 29 (Figure 14, HEC-RAS modeling simulation of the

[25] In discussing this imaging, Dr. Wang indicated in his testimony that the black line reflected in Figure 13 represents the exterior wall of the Eastern Alley. *See* Tr. 577-81; 656-57.

[26] Dr. Wang testified that this LiDAR imaging was in collected in November 2009. Tr. 578-79. He specifically identified the vertical and horizontal resolution of this LiDAR data in CX 20 at 8.

[27] Specifically, in his discussion of Complainant's Modeling Evidence Dr. Wang annotated variations of aerial photographs reflective of those in CX 12.13 and CX 12.26, for the period prior to the construction of the Manure Pit, and the period following construction of the Manure Pit, respectively. *See* CX 20 at 8, 19 (Figure 1); CX 20.3 (depicting annotated aerial photographs); *see also* CX 12.13; CX 12.26 (unlabeled aerial photographs in evidence).

[28] Dr. Wang noted that the column in Table 2 identified as "Runoff Curve Number" was intended to be labeled as "Manning's n Values," but was mislabeled in error. CX 20.1 at 5.

Riverview Facility on June 16, 2014). In doing this comparison, Dr. Wang determined that the results from this modeling were consistent with the observed conditions reported by EPA inspectors during the 2014 Inspection. *See id*.

B. Curve Number Method Modeling

After determining the watershed area contributing runoff to the Swale, including the areas of the Riverview Facility contributing process wastewater runoff to the Swale, with use of the HEC-RAS Model, Dr. Wang applied this information to Curve Number Method modeling to determine the volume of runoff from the Riverview Facility traveling to the Swale, the volume of runoff in the Swale draining into the inlet to the tile drainage system, and the dates upon which such runoff drained into the inlet of the tile drainage system over the period from 2011 through 2014, during the months of April through October. *See* CX 20 at 9-12; CX 20.1 at 1; Tr. 553-54, 575. The Curve Number Method is an empirical methodology, Tr. 567-68, CX 20.1 at 1, used to calculate stormwater runoff volume, Tr. 531, 561; CX 20 at 8; CX 20.1 at 1, 4.[29] As discussed by Dr. Wang, the Curve Number Method requires use of site-specific parameters regarding precipitation data, watershed area, soil characteristics and hydrological soil groups, soil moisture data, and land use to calculate rainfall runoff. S*ee* Tr. 561-62, 584; CX 20 at 8-9; CX 20.1 at 1. Accordingly, Dr. Wang calibrated the Curve Number Method to the conditions at the Riverview Facility in the Complainant's Modeling Evidence by utilizing information specific to the Riverview Facility for these parameters. *See infra* at 21-23. Further, as discussed below, for purposes of calculating dates upon which the Riverview Facility would contribute runoff to the Swale, and upon which runoff contained in the Swale would drain into the tile drain inlet, Dr. Wang performed site-specific calculations regarding the storage capacity of the process wastewater holding areas of the Riverview Facility (the north end of the Central Alley and Manure Pit), the storage capacity of the Swale, and the flow rate of runoff from the Swale into the intake pipe of the tile drain inlet for use in his Curve Number Method modeling. *See infra* at 24-27; CX 20 at 5, 10-12, 30; CX 20.1 at 2; CX 20. 2 at 1, 4, 41, 66, 88; CX 20.3. Finally, in using the Curve Number Method to identify dates upon which runoff from the Riverview Facility flowed to the Swale and drained into the tile drain inlet, Dr. Wang used site-specific information to account for evaporation and soil infiltration for the runoff. *See* CX 20.2 at 65; Tr. 618-20.

Calibration of Curve Number Method Parameters

In order to accurately model the volume of process wastewater runoff from the Riverview Facility traveling to the Swale, the volume of runoff in the Swale draining into the inlet to the tile drainage system, and the dates upon which such drainage occurred, Dr. Wang calibrated his Curve Number Method modeling to the Riverview Facility by applying site-specific data for each of the following parameters: precipitation data, watershed area, soil characteristics and hydrological soil groups, soil moisture data, and land use, as discussed below. For purposes of use in the Curve Number Method, Dr. Wang utilized daily precipitation data for the period from 2011 through 2014 from a rain gauge station located approximately five miles from the Riverview Facility in Swea City, Iowa, which is operated by the National Climatic Data Center ("NCDC") of the National Oceanic and Atmospheric Administration. *See* CX 20 at 6; CX 20.1

[29] Notably, the formula for the Curve Number Method utilized by Dr. Wang is reflected in CX 20.2 at 1.

at 2;[30] CX 20.2 at 5; Tr. 584-86, 646-47, 661-62; *see also* CX 20.2 at 5-39 (complete data from this rain gauge station used by Dr. Wang). In describing his decision to use the daily precipitation data from the NCDC rainfall gauge station in Swea City in his Curve Number Method modeling, Dr. Wang indicated that he selected this precipitation data to use because of its reliability as certified daily observational data, and also because the location of the rain gauge site is a close proximity to the Riverview Facility, thereby limiting concerns related to the spatial variability of rainfall. *See* CX 20.1 at 2; CX 20.2 at 5; Tr. 584-86, 646-47, 661-62.

Likewise, to determine the applicable watershed area for use in his Curve Number Method modeling of the Riverview Facility, Dr. Wang utilized the information gathered from his HEC-RAS modeling to determine the specific area of contributing runoff to the Swale, including the areas of the Riverview Facility contributing process wastewater runoff to this area. *See* Tr. 572-73, 575, 588-92; CX 20 at 10. Based upon this analysis, Dr. Wang determined that the applicable watershed area was approximately 25 acres, approximately 2.47 acres of which consisted of the feedlot portions of the Riverview Facility. *See* Tr. 588-92; *see also* CX 20 at 27 (Figure 12, delineating watershed area outlined in black).

Having determined the appropriate watershed area for his Curve Number Method Modeling, Dr. Wang then determined the soil characteristics and hydrological soil groups in the watershed. To accomplish this, Dr. Wang utilized information for the soil types in the identified watershed area from the Soil Survey Geographic Database of the NRCS, specific to Emmet County, Iowa. CX 20 a 7; CX 20.1 at 1; CX 20. 2 at 2; Tr. 595-96. From this analysis, Dr. Wang ascertained that the soil types in the areas of the Riverview Facility draining to the Swale were predominantly loamy or clay loam soils, with slow to very slow infiltration rates. CX 20 at 7, 15 (Table 1). Upon determining the specific soil types, Dr. Wang then applied the appropriate NRCS hydrological soil groups to these soil types for use in his Curve Number Method modeling. Tr. 593-97; CX 20 at 7, 15 (Table 1), 27 (Figure 12); CX 20.2 at 2. The majority of the soil in the watershed area was classified within the "C/D" hydrological soil group identified by the NRCS, which is associated with lower infiltration rates. *See* CX 20 at 15 (Table 1), 27 (Figure 12); CX 20.2 at 2; Tr. 596-97.

In order to account for soil moisture within his Curve Number Method modeling, Dr. Wang applied five-day antecedent rainfall information from the NRCS to areas of the watershed area that were not impervious, and where soil could retain moisture, to determine the antecedent moisture conditions. *See* CX 20.2 at 1; Tr. 599-600. Notably, since the concrete portions of the Riverview Facility were impervious, these areas were not included within the calculations for this parameter. *See* CX 20.2 at 2.

Finally, for purposes of calibrating the land use parameter of his Curve Number Method modeling to the conditions at the Riverview Facility, Dr. Wang evaluated land use within the Riverview Facility watershed area draining to the Swale, and applied corresponding input into such modeling to account for this land use. Specifically, Dr. Wang evaluated land use at the

[30] Notably, in CX 20.1, Dr. Wang described the NCDC rain gauge station in Swea City as "approximately 6 miles" from the Riverview Facility. CX 20.1 at 2. However, Dr. Wang clarified in his testimony that this site is actually less than five miles away from the Riverview Facility, Tr. 584, and in his discussion of this site in CX 20.2, he specifically identified that the location of this site is 4.8 miles away from the Riverview Facility, CX 20.2 at 5.

Riverview Facility based upon aerial photographs and information and photographs from the 2014 and 2016 Inspections of the Riverview Facility. Tr. 600-08; CX 20 at 5; CX 20.1 at 2. Based upon this review, Dr. Wang determined that the Riverview Facility watershed area draining to the Swale was comprised of four land use types for purposes of the Curve Number Method: feedlot, open space, farmstead, and crop land,[31] and he determined the area for each of these land use types.[32] Tr. 600-01; CX 20 at 16 (Table 3). After determining the land use types within the Riverview Facility watershed area and their respective areas, Dr. Wang applied "runoff curve number" inputs to these land use types based upon curve number inputs supplied by the NRCS for use in the Curve Number Method. *See* Tr. 600-02. As Dr. Wang described in his testimony, such runoff curve number inputs supplied by the NRCS represent the runoff index of a given material ranging from 0 to 100, and roughly equate to the percentage of runoff associated with such material. [33] Tr. 563-65. Accordingly, as Dr. Wang further explained in his testimony, lower curve number inputs are associated with lower runoff. Tr. 565. Although Dr. Wang generally based the runoff curve number inputs used in his Curve Number Method modeling for the Riverview Facility upon the recommended runoff curve numbers supplied by the NRCS for each corresponding land use area, he adjusted several of the runoff curve numbers downward from the recommended numbers, in the effort to maintain his conservative modeling approach in Respondents' favor. *See* Tr. 601-08; CX 20.1 at 1-2. For example, although the NRCS runoff curve number input recommended for concrete feedlot surfaces is 97, Dr. Wang applied a lower runoff curve number in modeling the concrete feedlot area. *See* Tr. 602-05; CX 20.1 at 1-2. Specifically, Dr. Wang applied a runoff curve number of 92 for the concrete feedlot area for every day he calculated modeling in the period from 2011 through 2014 except for the date of the 2014 Inspection, June 17, 2014, when he applied a runoff curve number of 96 to the concrete feedlot area for purposes of aligning the modeling to conditions observed during the 2014 Inspection regarding Manure Pit overflow. Tr. 602-04, 677-78; *see also* Tr. 664-65; CX 20.1 at 1 (statements from Dr. Wang discussing calibration of model based upon observations of the Manure Pit from the 2014 Inspection). Likewise, Dr. Wang testified that he applied a curve number of 94 to the open space area, even though he indicated that the recommended NRCS runoff curve number associated with this space is 97, Tr. 605, and he applied a runoff curve number of 86 for the crop land area, although the value for this area recommended by the NRCS is 89, Tr. 609. Dr. Wang, however, applied the recommended NRCS runoff curve number for the farmstead area, of 86, in his calculations, to take into account that at least a portion of this land encompassed paved areas. *See* Tr. 606.

Applying the aforementioned calibrated parameters regarding precipitation data, watershed area, soil characteristics and hydrological soil groups, soil moisture data, and land use to the formula for the Curve Number Method, *see* CX 20.2 at 1, Dr. Wang determined the overall runoff ratio for the Riverview Facility watershed as modeled for the period from 2011 through

[31] In his report in CX 20, Dr. Wang referred to the crop land as "cultivated field." *See* CX 20 at 16 (Table 3). However, for purposes of consistency with his testimony, this area is referred to in this decision as "crop land."

[32] Dr. Wang determined that the Riverview Facility watershed area draining to the Swale included 2.47 acres of feedlot area, 0.4 acres of open space area, 1.18 acres of farmstead area, and 20.82 acres of crop land. Tr. 600-01, 607.

[33] In an example used in his testimony, Dr. Wang stated that a material with a curve number of 30 would be associated with a 30 percent runoff rate, and a 70 percent infiltration rate. Tr. 563-64.

2014 was 0.21, meaning that 21 percent of rainfall at the Riverview Facility would become runoff, Tr. 620; CX 20 at 9, 16 (Table 4). In order to validate this finding, Dr. Wang compared it to several regional studies, including a study of 84 river basins in Iowa performed by the Minnesota Pollution Control Agency in 2016, revealing runoff ratios from 0.12 to 0.42 statewide, and a ratio of 0.28 for the East Fork of the Des Moines River basin specifically, and a study performed by Iowa State University in 2006, which reflected a runoff ratio of 0.25 in the vicinity of the Riverview Facility. CX 20 at 9; CX 20.1 at 2; Tr. 620-23. Dr. Wang concluded based upon this review that his calculation of the overall runoff ratio for the Riverview Facility is within the range of these localized studies, and therefore, that his Curve Number Method modeling was appropriately calibrated. *See* CX 20 at 9; CX 20.1 at 2, 4; Tr. 620-23. Likewise, in his testimony, Dr. Wang reported that for purposes of further validation of his Curve Number Method modeling, he applied his modeling to the dates of the 2016 Inspection, March 29-30, 2016, and he reported that his results reflected runoff from the feedlot consistent with observations during the 2016 Inspection, which he took as another indication that such modeling was calibrated to site conditions. *See* Tr. 623. Accordingly, Dr. Wang applied his Curve Number Method modeling to determine the volume of runoff from the Riverview Facility traveling to the Swale, the total volume of runoff in the Swale draining into the inlet to the tile drainage system when the capacity of the Swale was exceeded, and the dates upon which such runoff drained into the inlet of the tile drain system. *See infra* at 28-31; CX 20 at 10-12, 17 (Tables 5-6), 18 (Table 7), 32-34; CX 20.2 at 41-59; 66-84; 88-106. In order for Dr. Wang to use the Curve Number Method modeling to make such findings, however, Dr. Wang had to determine the storage capacity of the process wastewater holding areas of the Riverview Facility, the storage capacity of the Swale, the flow rate of runoff from the Swale into the inlet to the tile drainage system and the effects of evaporation and soil infiltration on runoff, as discussed further below.

Calculations Pertaining to Process Wastewater Holding Areas and Swale

In addition to utilizing site-specific information for the parameters of the Curve Number Method modeling, as noted, Dr. Wang also applied information premised upon the actual conditions at the Riverview Facility in his Curve Number Method modeling to calculate the storage capacity of the process wastewater holding areas at the Riverview Facility (including both the north end of the Central Alley and the Manure Pit) for purposes of determining dates upon which the Riverview Facility contributed runoff to the Swale, and to calculate the storage capacity of the Swale and the flow rate of runoff from the Swale into the inlet to the tile drainage system to determine the dates upon which runoff contained in the Swale exceeded the capacity of this area and drained into the inlet of the tile drainage system. Specifically, to calculate the dates upon which runoff from the Riverview Facility exceeded the storage capacity in the north end of the Central Alley (for the period prior to construction of the Manure Pit) or the Manure Pit (for the period following construction of the Manure Pit), and therefore contributed such runoff to the Swale, Dr. Wang calculated the storage capacity for these process wastewater holding areas of the Riverview Facility to incorporate into the Curve Number Method modeling. *See* CX 20 at 4-5, 11-12; CX 20.1 at 2; CX 20.2 at 4, 41; CX 20.3; Tr. 571, 608-09, 662. To determine the storage capacity of the north end of the Central Alley, where process wastewater was stored at the Riverview Facility prior to construction of the Manure Pit, and the Manure Pit, where process wastewater from the Riverview Facility was stored following such construction, Dr. Wang

evaluated aerial photographs, geospatial information data, and LiDAR data of these areas; photographs and dimension information regarding these areas obtained from the 2014 and 2016 Inspection Reports; and Respondents' reported Manure Pit removal schedule. *See* CX 20 at 10-12; CX 20.1 at 2; CX 20. 2 at 4; CX 20.3; Tr. 571, 608-09, 662. In his calculations regarding the north end of the Central Alley, Dr. Wang determined, based upon aerial imaging from prior to the construction of the Manure Pit and the LiDAR data of the Riverview Facility, that this area was approximately 130 feet in length, 38 feet in width, and had a ground surface slope of approximately 1.5 percent. CX 20.3. Based upon these dimensions and properties, Dr. Wang calculated that the north end of the Central Alley would hold approximately 1.5 feet of runoff at its north end wall, and collectively would contain a total of 27,713 gallons of runoff. CX 20.3.

For purposes of determining the storage capacity of the Manure Pit, Dr. Wang evaluated aerial photographs and geospatial information of the Riverview Facility after construction of the Manure Pit, as well as photographs and dimension information for the Manure Pit obtained from the 2014 and 2016 Inspection Reports, to calculate Manure Pit's surface area and depth. *See* CX 20 at 11; CX 20.1 at 2; CX 20.2 at 1, 4; Tr. 608-10. Based upon this evaluation, Dr. Wang determined that surface area of the Manure Pit was 0.11 acres. CX 20 at 11; CX 20.2 at 4. Although Mr. Urban reported that the depth of the Manure Pit was 8 feet in his observations during the 2016 Inspection, CX 8.6 at 1, 10, Dr. Wang calculated the capacity of the Manure Pit based upon a 10 foot depth, in an effort to apply his conservative modeling approach to determining the capacity of the Manure Pit, *see* Tr. 571, 608-09; CX 20 at 5, 11; CX 20.1 at 2; CX 20.2 at 4. Considering this surface area and depth, Dr. Wang concluded that the Manure Pit had a maximum possible capacity of 358,463 gallons. CX 20.2 at 4. However, in consideration of the presence of a concrete ramp, concrete supports, and a concrete apron in the interior of the Manure Pit observed in a photograph of the Manure Pit taken during the 2016 Inspection, as well as the presumed presence of sediment in the pit, Dr. Wang estimated that the overall actual capacity of the Manure Pit was 322,593 gallons, ten percent lower than the calculated maximum possible capacity. Tr. 608-09; CX 20 at 11; CX 20.1 at 2; CX 20.2 at 4.

Further, in addition to determining the overall capacity of the Manure Pit, Dr. Wang utilized information regarding Respondents' reported removal schedule for the Riverview Facility's Manure Pit, as well as the specific removal practices for the Manure Pit at the Riverview Facility, to account for these conditions in modeling daily storage in the Manure Pit in his Curve Number Method modeling. *See* CX 20 at 4, 11; CX 20.1 at 2; CX 20.2 at 1; Tr. 662. Based on Respondents' reports during the 2016 Inspection that material in the Manure Pit was removed and land applied each time hay was harvested, *see* CX 8 at 6; Tr. 376 (discussing Respondents' reports on this subject in 2016 Inspection), Dr. Wang calculated that material in the Manure Pit was removed on a schedule of four times annually, from June through September, in order to comport with hay harvest times reflected in literature from the Iowa State University, Tr. 662; CX 20 at 4, 11; CX 20.1 at 2; CX 20.2 at 1; *see also* Tr. 376-77 (testimony from Mr. Draper discussing hay harvest times).[34] Dr. Wang also considered the manure removal practices used in the Manure Pit at the Riverview Facility in determining its daily capacity in his Curve Number Method modeling. Based upon photographs of the Manure Pit at the Riverview Facility,

[34] Specifically, in his testimony, Dr. Wang indicated that he used the dates of June 1, July 1, August 1, and September 1, as Manure Pit removal service dates. Tr. 662.

Dr. Wang determined that the Manure Pit was not entirely emptied to the concrete floor following servicing, as the material in the Manure Pit consisted of liquid runoff as well as manure and sediment, and required use of agitation equipment for removal, making it difficult to empty the Manure Pit. *See* CX 20 at 11; CX 20.1 at 2; *see also* CX 2 at 8 (photograph of Manure Pit being serviced with agitation equipment, submitted by Respondents). Accordingly, based upon such information, Dr. Wang estimated that remaining material occupied 25 percent of the capacity of the Manure Pit after it was serviced, and that 75 percent of the capacity of the Manure Pit was available upon removal of material from the Manure Pit, equating to approximately 6.75 feet of space within the Manure Pit. CX 20 at 11; CX 20.1 at 2.

In addition to his analysis of the storage capacity of the areas of the Riverview Facility used to hold process wastewater, Dr. Wang also used information premised upon the actual conditions at the Riverview Facility to calculate the storage capacity of the Swale and the flow rate of runoff from the Swale into the intake pipe at the tile drain inlet for use in the Curve Number Method modeling, in order to determine the dates upon which runoff contained in the Swale exceeded the capacity of this area and drained into the inlet of the tile drainage system. To calculate the storage capacity of the Swale, meaning the total amount of runoff the Swale would hold before such runoff would drain into the inlet to the tile drain system, Dr. Wang determined the area and depth of the Swale by generating a three-dimensional representation of the Swale area using LiDAR data for the Swale from the University of Northern Iowa and geographic information systems software. *See* Tr. 612; *see also* CX 20.2 at 3 (LiDAR information of Riverview Facility); CX 20 at 30 (Figure 15, reflecting this three-dimensional representation). From this analysis, Dr. Wang extrapolated that the inlet to the tile drain system had an elevation of 1231.30 feet, and that the Swale was 0.66 acres in area, had an average depth of 0.67 feet, and a total storage capacity of 165,636 gallons. CX 20 at 10, 30 (Figure 15); Tr. 614-16; *see also* CX 20.2 at 65 (identifying the area of the Swale). Dr. Wang identified these findings regarding the Swale capacity as the "field conditions" for the Swale, and concluded that they accurately reflect the actual conditions of the Swale based upon the data employed in calculating the capacity, and also the observations of the Swale reported in the 2014 Inspection Report and accompanying photographs. *See* CX 20 at 10; Tr. 616-17. Nevertheless, Dr. Wang additionally calculated the capacity of the Swale assuming that the inlet to the tile drain system had a higher elevation of 1231.50 feet, closer to the elevation of the road adjacent to the Swale at the Riverview Facility, resulting in a larger Swale capacity of 369,048 gallons, in what he described as "road grade" conditions, for purposes of applying conditions more advantageous to Respondents than those reflected in the "field conditions" in Complainant's Modeling Evidence. Tr. 612-14, 616; CX 20 at 10, 17; CX 20.2 at 66, 88. To determine the flow rate of runoff into the intake pipe at the inlet to the tile drainage system at the Swale, Dr. Wang referred to manufacturer supplied information regarding typical occlusion of tile inlet intake pipe holes, which indicated that approximately 50 percent of the holes on the tile drain inlet intake pipe would be occluded. *See* CX 20.2 at 66, 88. For purposes of maintaining his conservative modeling approach in Complainant's Modeling Evidence, however, Dr. Wang estimate that only 25 percent of the holes on the intake pipe to the tile drain inlet at the Swale were occluded, resulting in a estimated flow rate of 0.27 cubic feet per second at one foot water depth, resulting in a daily maximum flow capacity into the tile drain inlet of 174, 493 gallons of runoff, in both

field and road grade conditions.[35] CX 20 at 10-11, 32 (Appendix A), 33 (Appendix B); CX 20.2 at 66, 88; *see also* Tr. 560 (discussing use of higher inlet intake rate for purposes of conservative modeling in Respondents' favor).

Calculations Regarding Evaporation and Soil Infiltration

Finally, as noted, in using the Curve Number Method with the aforementioned information regarding the capacities of the process wastewater holding areas of the Riverview Facility and Swale, and the flow rate of runoff from the Swale into the tile drain inlet, to determine the volume of runoff from the Riverview Facility traveling to the Swale, the volume of runoff in the Swale draining into the inlet to the tile drainage system, and the dates upon which such runoff drained into the inlet of the tile drainage system, Dr. Wang also used information reflective of the conditions of the Riverview Facility to account for evaporation in both the Manure Pit and Swale areas, and soil infiltration for runoff contained in the Swale.[36] *See* CX 20.2 at 65. To calculate the evaporation rates for runoff contained in the Manure Pit and Swale areas, Dr. Wang considered the annual evaporation rates of four different lakes in Iowa in the vicinity of the Riverview Facility (collectively having an annual evaporation rate of 0.83 meters or 32.58 inches), as well as the annual pan evaporation dates for Emmet County, Iowa reported by the National Weather Service of the National Oceanic and Atmospheric Administration from 1956-1970 (which ranged from 38 inches to 40 inches). CX 20.2 at 65; Tr. 618-20. For purposes of using evaporation input in Respondents' favor, consistent with his overall conservative modeling approach, Dr. Wang applied higher evaporation rates to both the Manure Pit and Swale than the average annual evaporation rate of the four Iowa lakes in the vicinity of the Riverview Facility and the annual pan evaporation rates for Emmet County from the National Weather Service. *See* CX 20.2 at 65; *see also* Tr. 560, 571, 618- 20 (discussing reasoning behind applying higher evaporation rates in calculations). Specifically, Dr. Wang applied an annual evaporation rate of 1.3 meters for the Manure Pit, and an annual evaporation rate of 1.6 meters to the Swale.[37] CX 20.2 at 65. Notably, to further calculate evaporation from the Manure Pit and Swale in Respondents' favor, Dr. Wang also used higher surface areas for both of these areas in calculating evaporation. CX 20.2 at 65. Dr. Wang then applied his favorable evaporation calculations to the Curve Number Method modeling in determining runoff from the Manure Pit to the Swale, and runoff in the Swale entering the tile drainage inlet. *See* CX 20.2. Additionally, as noted, Dr. Wang also accounted for ground infiltration into the Swale based upon the conditions at the Riverview Facility, by applying an infiltration rate based upon the hydrological soil group of the soil underlying the Swale area. CX 20.2 at 65. Dr. Wang noted that the soil of the Swale area is classified in the NRCS C/D hydrological soil group, associated with an infiltration rate between 0.0 to 0.05 inches per hour in natural conditions. CX 20.2 at 65; *see*

[35] In his testimony, Dr. Wang described how assuming a higher occlusion rate for the tile drain inlet would result in a reduced flow from the Swale, associated with additional days of drainage from the Swale, and more overall days of discharge from the Swale. *See* Tr. 692.

[36] Dr. Wang testified that he did not consider soil infiltration for the process wastewater maintained in the Manure Pit, because the Manure Pit was concrete, rather than soil, and therefore such infiltration was not applicable. Tr. 619.

[37] As discussed in CX 20.2, Dr. Wang applied two evaporation rates to the Swale, to account for higher evaporation in the months of May through October, with the total annual evaporation rate reflecting 1.6 meters.

also CX 20 at 27 (Figure 12); CX 20.2 at 2 (hydrological soil group maps of the Riverview Facility). Based upon this data, Dr. Wang applied an infiltration rate of 0.02 to his Curve Number Method modeling of the Riverview Facility, in consideration of the fact that such soil would be saturated before runoff would occur.[38] CX 20.2 at 65. As with his evaporation calculations, Dr. Wang also applied a larger area size for the Swale, of 1.3 acres, to estimate soil infiltration in the Swale in Respondents' favor. *See* CX 20.2 at 65. Dr. Wang then applied this favorable ground infiltration rate for the runoff in the Swale in his Curve Number Method modeling regarding runoff in the Swale and dates upon which runoff in the Swale entered the inlet of the tile drain system. *See* CX 20.2 at 65.

Curve Number Method Modeling Results for Manure Pit

Dr. Wang applied his calculations regarding the capacity of the Manure Pit to the Curve Number Method modeling for the Riverview Facility, accounting for evaporation as discussed above, to determine the daily storage volume in the Manure Pit for the period from 2012 to 2014, and further identify the dates upon which the Manure Pit exceeded capacity and contributed process wastewater runoff to the Swale, as well as the volume of such runoff, for the months of April through October during the period from 2012 through 2014. *See* CX 20 at 11-12, 18 (Table 7), 31 (Figure 16); CX 20.2 at 41-64. Dr. Wang's calculations identified 20 dates in the months of April through October during the period from 2012 through 2014 upon which the capacity of the Manure Pit was exceeded and runoff from the Manure Pit was contributed to the Swale, including the date of the 2014 Inspection, June 17, 2014. *See* CX 20 at 17 (Table 5), 18 (Table 7); CX 20.2 at 41-64. From his Curve Number Method modeling, Dr. Wang determined that the Manure Pit contributed 18,499 gallons of process wastewater to the Swale on June 17, 2014. CX 20.2 at 59. Dr. Wang asserted that this modeling result is consistent with the inspectors' observations during the 2014 Inspection, and that this consistency serves to validate his findings regarding overflow from the Manure Pit. *See* CX 20.1 at 3.

Curve Number Method Modeling Results for Swale

Applying the determined capacities of the process wastewater holding areas, as well as the capacity of the Swale and flow rate of runoff from the Swale into the inlet to the tile drain system, to the Curve Number Method modeling after accounting for evaporation and soil infiltration, as described above, Dr. Wang determined the dates upon which runoff in the Swale exceeded the capacity of the Swale and entered the inlet to the tile drainage system, and the daily volume of runoff entering the tile drain inlet from the Swale for both the field conditions of the Swale and the more conservative road grade conditions of the Swale. *See* CX 20 at 32-34; CX 20.2 at 66-84; 88-106. As discussed below, both applied modeling conditions for the Swale resulted in numerous days in which runoff in the Swale drained into the tile drain inlet during the period of alleged violations, including multi-day draining events. *See id.* Notably, because Dr. Wang determined that the daily maximum flow capacity into the tile drain inlet was 174,493 gallons of runoff, *see* CX 20 at 32 (Appendix A), 33 (Appendix B); CX 20.2 at 66, 88, Dr. Wang's modeling results for both field and road grade conditions reflect dates upon which the

[38] Dr. Wang notably indicated in his testimony that this applied infiltration rate for the Swale was calculated in favor of higher infiltration, as part of his conservative modeling approach. Tr. at 560.

amount of runoff generated to the Swale exceeded the daily maximum flow capacity, resulting in such excess runoff taking more than one day to drain into the drain tile inlet, *see* CX 20 at 32-34; CX 20.2 at 66-84; 88-106.

Dr. Wang's Curve Number Method modeling for the field conditions of the Swale calculated a total number of 41 days in which process wastewater runoff in the Swale exceeded the capacity and entered the inlet to the tile drainage system during the period from May 10, 2011 to June 18, 2014, the date upon which Respondents blocked the intake pipe at the tile drain inlet in the Swale.[39] *See* CX 20 at 32-34; CX 88-106; CX 20.3.[40] The specific volume of runoff draining into the tile drain inlet for each date that runoff drained into the inlet under the field conditions for the Swale in Complainant's Modeling Evidence is identified below in Table A.[41]

Table A: *Dates and Volumes of Runoff Draining into Tile Drain Inlet for Field Conditions in Swale*

Year	Month	Day	Volume of runoff draining into tile drain inlet from Swale (in gallons)
2011	May	20	52,392
2011	May	21	33,176
2011	May	22	174,493*
2011	May	23	39,877
2011	May	26	174,493*
2011	May	27	18,111
2011	June	15	174,493*
2011	June	16	174,493*
2011	June	17	77,988
2011	June	19	174,493*
2011	June	20	174,493*
2011	June	21	174,493*
2011	June	22	174,493*
2011	June	23	95,123

[39] In describing his Curve Number Modeling results for the field conditions at the Swale, Dr. Wang referred to a total of 50 days on which he calculated that runoff from the Swale drained into the tile drain inlet. *See, e.g.*, CX 20 at 12, 17 (Table 5); Tr. 676. However, this overall figure includes dates on and after June 18, 2014, the date upon which Respondents blocked the intake pipe at the tile drain inlet in the Swale. *See* CX 20 at 33-34; CX 20. 2 at 88-106.

[40] Notably, in reporting modeling results for the field condition at the Swale in CX 20, Dr. Wang included June 10, 2011, as a date upon which runoff in the Swale drained into the inlet of the tile drain system. *See* CX 20 at 33. However, in CX 20.3, Dr. Wang indicated the inclusion of this date was an error, and that runoff in the Swale would not enter the tile drain inlet on this date. CX 20.3; *see also* CX 20.2 at 68 (showing modeling results under the field condition for June 10, 2011 reflecting no drainage to the tile drain inlet). Accordingly, this date was not included in this discussion of the results for the field condition above

[41] Dates upon which the drainage of runoff into the tile drain inlet from the Swale reached the daily maximum flow capacity of 174, 493 gallons are marked with an asterisk in both Table A and Table B.

2012	April	20	174,493*
2012	April	21	96,070
2013	April	10	174,493*
2013	April	11	174,493*
2013	April	12	174,493*
2013	April	13	130,044
2013	April	19	89,444
2013	April	20	115,724
2013	April	21	127,083
2013	April	23	174,493*
2013	April	24	144,806
2013	May	2	34,793
2013	May	17	174,493*
2013	May	18	174,493*
2013	May	19	174,493*
2013	May	20	174,493*
2013	May	21	133,219
2013	June	22	174,493*
2013	June	23	174,493*
2013	June	24	174,493*
2013	June	25	157,755
2014	April	28	59,603
2014	April	29	61,681
2014	April	30	21,021
2014	June	2	124,608
2014	June	15	101,886
2014	June	17	174,493*

See CX 20 at 33-34; CX 20. 2 at 88-106.

Conducting the same modeling with use of the road grade conditions at the Swale, Dr. Wang calculated a total number of 29 days in which process wastewater runoff in the Swale entered the inlet to the tile drain system during the period from May 10, 2011 to June 18, 2014, the date upon which Respondents blocked the intake pipe at the tile drain inlet in the Swale.[42] *See* CX 20 at 32; CX 20.2 at 66-84. The specific volume of runoff draining into the tile drain inlet for each date that runoff drained into the inlet during this period under the road grade conditions for the Swale in Complainant's Modeling Evidence is identified below in Table B.

[42] In describing his Curve Number Modeling results for the road grade conditions at the Swale, Dr. Wang referred to a total of 35 days on which he calculated that runoff from the Swale drained into the tile drain inlet. *See, e.g.*, CX 20 at 17 (Table 5); Tr. 676. However, this overall figure includes dates on and after June 18, 2014, the date upon which Respondents blocked the intake pipe at the tile drain inlet in the Swale. *See* CX 20 at 32; CX 20.2 at 66-84.

Table B: *Dates and Volumes of Runoff Draining into Tile Drain Inlet for Road Grade Conditions in Swale*

Year	Month	Day	Volume of runoff draining into tile drain inlet from Swale (in gallons)
2011	May	22	96,525
2011	May	26	174,493*
2011	May	27	18,111
2011	June	15	174,493*
2011	June	16	72,837
2011	June	19	174,493*
2011	June	20	174,493*
2011	June	21	174,493*
2011	June	22	174,493*
2011	June	23	95,123
2012	April	20	67,151
2013	April	10	96,655
2013	April	11	174,493*
2013	April	12	174,493*
2013	April	13	4,470
2013	April	19	89,444
2013	April	20	115,724
2013	April	21	127,083
2013	April	23	174,493*
2013	April	24	144,806
2013	May	2	34,793
2013	May	17	174,493*
2013	May	18	174,493*
2013	May	19	174,493*
2013	May	20	136,484
2013	June	22	174,493*
2013	June	23	174,493*
2013	June	24	128,836
2014	June	17	174,493*

See CX 20 at 32; CX 20.2 at 66-84.

C. Flow Analysis for Tile Drainage System

After determining the dates upon which runoff from the Swale drained into the inlet to the tile drainage system based upon HEC-RAS and Curve Number Method modeling in Complainant's Modeling Evidence, Dr. Wang performed a flow analysis of the runoff in the tile drainage system to determine whether runoff entering the inlet to the tile drain system on the dates identified between 2011 and 2014 discharged into the East Fork of the Des Moines River.

See CX 44; CX 45; Tr. 624-28. To assess the flow of runoff in the tile drainage system, Dr. Wang analyzed LiDAR data of the tile drainage system at the Riverview Facility to ascertain the elevation differential between the inlet and outlet, and evaluate the head pressure of runoff flowing through the tile drainage system. *See* Tr. 624; CX 45; *see also* CX 33 (LiDAR data for Riverview Facility and location of tile drain outlet).

From this analysis, Dr. Wang determined that the inlet to the tile drainage system had an elevation of 1,231 feet, and the outlet of the tile drainage system had an elevation of approximately 1,196, meaning that the outlet had a lower elevation of 35 feet. Tr. 624; CX 45. Based upon this elevation differential, Dr. Wang concluded that runoff exiting the tile drain outlet would be under a high head pressure commensurate with the 35-foot elevation differential, *see* Tr. 625-26, and would only be precluded from flowing if met with equal pressure, s*ee* Tr. 45; 625-26. Additionally, from the LiDAR data, Dr. Wang determined that the height of the bank of the East Fork of the Des Moines River has an elevation at 1,195, lower than the outlet of the tile drain system. CX 45. Considering these conditions, Dr. Wang concluded that runoff would continue to flow from the outlet of the tile drainage system to the East Fork of the Des Moines River even in circumstances where the tile drain outlet were submerged in 10 feet of water. Tr. 625-26.

Despite this conclusion regarding the functioning of the tile drain outlet in submerged conditions, Dr. Wang nevertheless conducted an evaluation of the conditions at the East Fork of the Des Moines River during the period of alleged violations to determine any dates upon which runoff from the tile drainage system exited the outlet in submerged conditions. *See* Tr. 631-37; CX 44. To make this determination, Dr. Wang relied upon United States Geological Survey data from two stream gauges located in the East Fork of the Des Moines River, in Algona, Iowa (approximately 18 miles away from the tile drain outlet for the Riverview Facility) and Burt, Iowa (approximately 23 miles away from the tile drain outlet for the Riverview Facility), as well as the drainage areas to the river associated with these gauge locations. *See* CX 44 at 1-2; Tr. 631-32. Dr. Wang reported that he applied this data to a ratio-based equation used by United States Geological Survey to calculate the flow rate of the East Fork of the Des Moines River. *See* Tr. 636-37. From this analysis, Dr. Wang identified only three dates under both the field and road grade conditions upon which runoff from the Swale exited the tile drain outlet in submerged conditions during the period of alleged violations: June 22, 2011; June 23, 2011; and June 18, 2014.[43] Tr. 632. For purposes of more specifically considering the conditions at the outlet of the tile drain system at the time of the 2014 Inspection, on June 17, 2014, Dr. Wang reported that he compared his calculations regarding flow rate for the East Fork of the Des Moines River on this date with the conditions he calculated for a date upon which Respondents had photographed the tile drain outlet being submerged, October 11, 2018. *See* Tr. 629-30, 635-36; *see also* RX 36 (photograph of the submerged outlet to the tile drainage system referred to by Dr. Wang). From this comparison, Dr. Wang determined that the October 11, 2018 date had a 45 percent higher flow rate than the date of 2014 Inspection, and he concluded that this supported the finding that the tile drain outlet was not submerged on this date. *See* Tr. 629-30, 635-36; *see also* CX 44 (calculations performed by Dr. Wang for flow rate at outlet of tile drainage system on June 17, 2014).

[43] Notably, this would be for the entire period of alleged violations, including June 18, 2014.

Finally, having analyzed the flow of runoff in the Riverview Facility's tile drainage system, and the impact and occurrence of the tile drain outlet being submerged during the period of alleged violations, Dr. Wang also considered the fate and transport of E. coli bacteria in runoff from the Swale to the outlet of the tile drainage system. *See* CX 20.1 at 3-4. To determine the amount of time it would take for runoff entering the inlet of the tile drainage system at the Swale to reach the outlet, Dr. Wang applied a velocity of 0.5 feet per second, based upon NRCS data regarding the minimum velocity required in a tile drain system to prevent sediment deposition. CX 20.1 at 3. Applying this velocity to the length of the tile drainage system from the tile drain inlet to the tile drain outlet, which Dr. Wang determined was approximately 2,700 feet, he calculated that it would take runoff approximately 1.5 hours to traverse from inlet to outlet. CX 20.1 at 3. Dr. Wang then applied this timeframe to an equation for E. coli decay developed by the EPA, assuming a decay rate of 0.91 per day with conditions at 15 degrees Celsius. CX 20.1 at 3. For purposes of calculating the concentration of E. coli within the runoff entering tile inlet, Dr. Wang applied the findings from Sample 1 of the 2014 Inspection, taken at the tile drain inlet, which reflected 4,110,000 counts of E. coli per 100 milliliters. CX 20.1 at 3; *see also* CX 1.14 at 1 (water quality report of Sample 1 from the 2014 Inspection). Based upon his calculations using this input, Dr. Wang determined that the runoff exiting the tile drain outlet would have an E. coli concentration of 229,051 counts per 100 milliliters for a travel time of 1.5 hours, under both the field and road grade conditions for the Swale. CX 20.1 at 3-4. Notably, Dr. Wang noted that applying a longer travel time of one day under both the field and road grade conditions for the Swale resulted in an E. coli concentration of 97,390 counts per 100 milliliters. *Id.* Dr. Wang observed that both the calculation for the estimated 1.5 hour travel time from inlet to outlet of the tile drain system, and the calculation for a longer travel time of one day, exceed an Iowa water quality standard of 126 counts per 100 milliliters for an impaired portion of the East Fork of the Des Moines River by "several orders of magnitude," and concluded that this indicates that the discharge of runoff from the tile drain outlet to the East Fork of the Des Moines River on June 17, 2014, the day of the 2014 Inspection when Sample 1 was obtained, had a significant effect on the E. coli concentration in the East Fork of the Des Moines River. CX 20.1 at 3.

D. April 2018 Site Visit

On April 25, 2018, Dr. Wang performed a site visit of the Riverview Facility ("April 2018 Site Visit") with Mr. Draper and Ms. Benson for purposes of evaluating the model inputs and calibration in Complainant's Modeling Evidence. *See* Tr. 418, 629, 633, 670, 912. Respondent Tony Brown cooperated during this site visit, allowing Dr. Wang and Mr. Draper to view areas of the Riverview Facility, and further answering questions from Mr. Draper. *See* Tr. 421-24. During the April 2018 Site Visit, Dr. Wang and Mr. Draper viewed areas of the Riverview Facility including the Central Alley, Manure Pit, and Feedstock Storage Area. *See* Tr. 420-24, 484, 633.

Additionally, Dr. Wang and Mr. Draper viewed the outlet of the tile drainage system of the Riverview Facility, and were accompanied by Respondent Tony Brown during this portion of the April 2018 Site Visit. *See* Tr. 425, 629, 670-71, 912-13. At the outlet of the tile drainage system, Dr. Wang and Mr. Draper observed that the tile drain outlet was submerged. *See* Tr.

425, 671-72. Standing approximately four to six feet away from the tile drain outlet, Dr. Wang and Mr. Draper observed still water on the surface, but noticed submerged grass located nearby the outlet moving consistently in the direction away from the tile drain outlet and in the direction of the river. Tr. 426-27, 629, 671-72. This observation caused both Dr. Wang and Mr. Draper to conclude that water was flowing from the outlet of the tile drainage system. *See* Tr. 427, 672.

After viewing the tile drain outlet, Dr. Wang, Mr. Draper, and Ms. Benson observed the East Fork of the Des Moines River from the 200th Street Bridge, and Mr. Draper took photographs of the river from this view, including photographs contained in CX 53.3 and CX 53.4. Tr. 429-30. With regard to the water level of the East Fork of the Des Moines River during the April 2018 Site Inspection, Mr. Draper stated that the water level of the river was at a higher level than it was when he observed during the 2016 Inspection, Tr. 425, and he further commented that from the view at the 200th Street Bridge, the river also appeared higher than what he had seen depicted in photographs from the 2014 Inspection, Tr. 430-31. Dr. Wang reported that his observations during the April 2018 Site Visit assured him regarding his modeling and made him believe the results of the modeling are accurate. Tr. 633.

Notably, at hearing, Mr. Draper testified that Respondent Tony Brown admitted to him during the April 2018 Site Visit that Respondents had a problem on the date of the 2014 Inspection and that the Riverview Facility had "discharged."[44] *See* Tr. 427-29; 496-97, 502-03. Mr. Draper further testified that he interpreted this statement from Respondent Tony Brown as admitting that there was a discharge from the Riverview Facility to the East Fork of the Des Moines River on the date of the 2014 Inspection. *See* Tr. 428-29; 496-97. However, Respondent Tony Brown, in his testimony, denied acknowledging that the Riverview Facility discharged to the East Fork of the Des Moines River in his conversation with Mr. Draper during the April 2018 Site Visit. Instead, he testified that he had admitted that Respondents had a problem on the date of the 2014 Inspection, and acknowledged that the Manure Pit overflowed. *See* Tr. 916-17. Notably, Respondent Tony Brown indicated that he may have used the term "discharge" in the context of discussing the Manure Pit overflowing on this date. *See* Tr. 916. Although Mr. Draper indicated that Ms. Benson was a party to the conversation between himself and Respondent Tony Brown at some point, *see* Tr. 428, Ms. Benson testified that she did not hear the reported admission from Respondent Tony Brown, Tr. 1041.

ii. Respondent's Expert Evidence

In addition to the expert evidence from Dr. Wang submitted by Complainant, Respondents additionally offered expert evidence from Ms. Heikens, a professional engineer who assisted Respondents' with preparing a NPDES permit application for the Riverview Facility following the alleged period of violations, and Mr. Hentges, a consulting hydrogeologist regarding this matter. In her work for Respondents, Ms. Heikens preformed calculations reflected in CX 55.1-CX 55.4, including calculations regarding the capacity of the Manure Pit, and the watershed area contributing runoff to the culvert area developed by Respondents in the Swale area. *See* Tr. 1085-86, 1099-1105; CX 55.1; CX 55.2; CX 55.3; CX 55.4. Mr. Hentges

[44] As discussed below, I find that the testimony pertaining to such an admission had no probative value, and accordingly, I did not consider it in my determination regarding liability for the alleged violations. However, as this testimony was discussed by the parties, it is addressed herein.

did not perform independent calculations regarding the Riverview Facility, but he conducted a review of case materials, including Complainant's Modeling Evidence, and discussed his opinions regarding such evidence in a report he prepared in RX 2 and in his testimony. Additionally, Mr. Hentges provided testimony regarding his observations and conclusions from a site visit to the Riverview Facility and the tile drain outlet in May 2018, as discussed below.

A. Heikens' Calculations

Ms. Heikens was contacted by Respondents following the 2014 Inspection, in June 2015, regarding potentially preparing a NPDES permit application for the Riverview Facility, and was ultimately hired by Respondents for this purpose. *See* Tr. 1079-81, 1097-99. As a result, Ms. Heikens prepared a topographical map of the Riverview Facility based upon observed ground points, *see* Tr. 1085, 1110-11 (testimony regarding topographical map); CX 55.3 at 1 (topographical map), and otherwise prepared certain calculations in support of preparing such a permit application for the Riverview Facility, s*ee* Tr. 1085-86; 1099-1105 (testimony regarding calculations); CX 55.1; CX 55.3[45] (documents reflecting calculations). Among such calculations, Ms. Heikens calculated the area of the Riverview Facility draining runoff to the Manure Pit and the capacity of the Manure Pit to hold runoff from the Riverview Facility expected to occur as the result of a 25-year, 24-hour precipitation event. *See* Tr. 1085-86; CX 55.3 at 2, 4. Additionally, Ms. Heikens calculated the watershed area contributing runoff to the culvert area developed by Respondents in the Swale area. *See* Tr. 1084, 1103-04; CX 55.3 at 11.

Ms. Heikens determined that the area draining to the Manure Pit was 2.3 acres, CX 55.3 at 4, and did not include the Feedstock Storage Area, as runoff from that area bypassed the Manure Pit, Tr. 1101-02, CX 55.3 at 4.[46] Notably, in making her calculations regarding runoff, Ms. Heikens indicated that she did not apply the Curve Number Method to calculate runoff volume, but instead presumed that the area draining to the Manure Pit was impervious.[47] Tr. 1099-1101. Based upon her calculations, Ms. Heikens concluded that the existing Manure Pit, with a depth of approximately eight feet, would not contain the runoff expected to occur as the result of a 25-year, 24-hour precipitation event, which she determined was 5.2 inches. *See* Tr. 1085-86; CX 55.3 at 2. As a result, Ms. Heikens concluded that Respondents would be unable to obtain a NPDES permit without further modification to the Riverview Facility, given the inability of the Manure Pit to contain such runoff. *See* Tr. 1086. Ms. Heikens indicated that following her initial calculations, Respondents developed the Riverview Facility to expand the manure storage capacity by building a second manure storage area under a newly constructed building and further roofed Pens 5 and 6. *See* Tr. 1088-1090. Ms. Heikens indicated that with

[45] The Exhibit CX 55.3 is erroneously marked within the document as CX 53.3. *See* CX 55.3; Tr. 1109-13.

[46] Notably, in draft documents prepared by Ms. Heikens, she initially indicated that runoff from the Feedstock Storage Area drained into the Manure Pit, *see* CX 55.1 at 23, and that the overall area draining to the Manure Pit was 2.80 acres, *see* CX 55.3. However, Ms. Heikens explained that the inclusion of the Feedstock Storage Area in the drainage area to the Manure Pit was an error, *see* Tr. 1101-02; CX 55.3 at 4, and determined that the actual drainage area to the Manure Pit was 2.3 acres, CX 55.3.

[47] Ms. Heikens acknowledged that she had soil map information from NRCS for the Riverview Facility, but did not employ it in her calculations as she presumed that the area draining to the Manure Pit was impervious. *See* Tr. 1100; CX 55.1 at 27.

these improvements, the Riverview Facility is able to contain the runoff expected to occur as the result of a 25-year, 24-hour precipitation event.[48] *See* Tr. 1086.

In addition to her calculations regarding the Manure Pit, Ms. Heikens also determined the watershed area contributing runoff to the culvert area developed by Respondents in the Swale area.[49] *See* Tr. 1084, 1103-04; *see also* CX 55.3 at 11 (outlining this watershed area). For purposes of determining the area contained within this watershed, Ms. Heikens utilized LiDAR data for the Riverview Facility. Tr. 1084, 1103-04. Based upon her evaluation, Ms. Heikens determined this watershed area was 25 acres, and she generated an outlined map of this watershed area in CX 55.3 at 11. *See* Tr. 1084; 1103-04. Notably, Ms. Heikens indicated in her testimony that there was relative similarity between her map of this watershed area in CX 55.3 at 11, and Dr. Wang's calculation of the watershed area for the Swale, as reflected in LiDAR imaging in Figure 13 of CX 20 at 28, though she indicated there may be some slight differential with the specific areas included. Tr. 1104-1105.

B. Hentges' Analysis of Complainant's Modeling Evidence

Hentges' Report in RX 2

Mr. Hentges was hired to consult on Respondents' behalf regarding Complainant's Modeling Evidence in Fall 2016. Tr. 1124, 1190. For purposes of performing an analysis regarding Complainant's Modeling Evidence, Mr. Hentges reviewed certain case materials, including the report and addendums prepared by Dr. Wang, inspection reports from the 2014 and 2016 inspections, as well as aerial photographs and maps of the Riverview Facility. *See* Tr. 1124, 1190; RX 2. Based upon his review of such information, Mr. Hentges prepared a seven-page "Statement of Opinion" report contained in RX 2, reflecting his observations and opinions regarding materials from the 2014 and 2016 Inspections, *see* RX 2 at 2-6, and a brief analysis and statement of opinion regarding Complainant's Modeling Evidence, *see* RX 2 at 1-2, 6. Mr. Hentges testified that his report in RX 2 was reviewed by his supervisor for quality review purposes. Tr. 1241. However, it is notable that this report is devoid of citations to documents or information in support of the opinions represented by Mr. Hentges, with the exception of references to monthly operating reports for the City of Armstrong wastewater treatment plant for the months of May and June 2014. *See* RX 2; *see also* Tr. 1212 (testimony from Mr. Hentges acknowledging that this report does not contain "formal citations").[50]

As noted, Mr. Hentges offers critique of the evidence obtained during both the 2014 and 2016 Inspections of the Riverview Facility in his report in RX 2. *See* RX 2 at 2-6. With regard to the 2014 Inspection, in his report in RX 2, Mr. Hentges broadly asserts:

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[48] Ms. Heikens also noted that she visited the Riverview Facility the day before her testimony, and she observed facility changes, such as grading on the north side of the feedlot area, which were not reflected in previous topographical studies of the Riverview Facility that she used. *See* Tr. 1093.

[49] Ms. Heikens also testified that she provided Respondents with rainfall data for Estherville, Iowa, in RX 8, for the month of June in 2014. *See* Tr. 1095-96; RX 8.

[50] Notably, the report from Mr. Hentges in RX 2 also does not cite referenced materials from the 2014 and 2016 Inspections and Complainant's Modeling Evidence with specificity. *See* RX 2.

> The facility had received approximately 6 inches of rain in the previous 48 hours before the inspection on June 17, 2014. This precipitation event would amount to a storm with about a 25 year return period (storm that happens once every 25 years based on records for the area).

RX 2 at 2. However, Mr. Hentges does not identify any sources supporting his conclusions regarding the precipitation conditions at the Riverview Facility at the time of the 2014 Inspection. *See* RX 2 at 2. Mr. Hentges further asserts in his report that while the report of the 2014 Inspection reflects that inspectors observed ponding and pooling of process wastewater east of the Riverview Facility during the 2014 Inspection, such observations are not supported by photographs from the 2014 Inspection, which he asserts depict stormwater that "appears to be pooled and not flowing." RX 2 at 2. However, in his testimony, Mr. Hentges acknowledged that his statement in the report regarding such photographs is not accurate. *See* Tr. 1248. Specifically, when showed the photograph in CX 29.6, an enlargement of a photograph taken during the 2014 Inspection in CX 1.5 at 32, depicting runoff situated east of the Riverview Facility, Mr. Hentges conceded that the photograph reflected moving water, as evidenced by visible ripples. Tr. 1248. With regard to the samples collected during the 2014 Inspection, in his report, Mr. Hentges acknowledges that water quality testing performed on Sample 1 from the 2014 Inspection, taken at the Swale, reflects "elevated levels of ammonia nitrogen, total kjeldhal nitrogen, total suspended solids, biological oxygen demand, total phosphorous and E. coli bacteria," he argues that such results "could be representative of the storm water runoff from the row crop area where process water and manure are land applied under an approved management plan." RX 2 at 2. Likewise, Mr. Hentges argues in his report that a water sample should have been collected from the outlet of the tile drainage system if this outlet was not submerged, RX 2 at 3, and otherwise indicates that water samples should have been collected from areas above, within, and below the location where water from the tile drainage outlet entered the East Fork of the Des Moines River, RX 2 at 2. However, in his testimony, Mr. Hentges acknowledged that the holding time issue raised with regard to the 2014 Inspection is a valid concern, and that ". . . there is no doubt if the samples [from the 2014 Inspection] were out of holding time I might be making a big deal about it here." Tr. 1267.

Finally, with regard to the 2014 Inspection, Mr. Hentges opines in his report in RX 2, that

> It is likely the tile line outfalls at the East Fork of the Des Moines River were submerged at this time. I[f] the tile line outfalls were submerged by the flow in the river, a discharge would not have occurred due to the head pressure of water in the river pushing back on the water in the tile line.

RX 2 at 3. Mr. Hentges indicates that this conclusion is based upon information obtained from monthly operating reports for the City of Armstrong Wastewater Treatment Plant for the months of May and June 2014, which reflect a daily maximum flow rate for the East Fork of the Des Moines River of 222 cubic feet per second in May 2014, and 2,222 cubic feet per second in June

2014.[51] RX 2 at 3; *see also* RX 5 (May and June 2014 monthly operating reports for City of Armstrong wastewater treatment plant). Mr. Hentges further asserts that the City of Armstrong Wastewater Treatment Plant "is just upstream" from the Riverview Facility, though he does not provide more specific location information identifying the distance of this wastewater treatment facility from the Riverview Facility. *See* RX 2 at 3. Further, Mr. Hentges does not identify how he determined from this data that the outlet to the tile drainage system would be submerged. *See* RX 2 at 3. Notably, in his testimony, Mr. Hentges acknowledged that during the course of the hearing in this mater he heard testimony that led him to believe that the monthly operation reports from the City of Armstrong Wastewater Treatment Plant that he referenced in his report may not accurately reflect the conditions at the outlet of the tile drainage system for the Riverview Facility. *See* Tr. 1259-60. Mr. Hentges' testimony regarding the City of Armstrong Wastewater Treatment Plant data is consistent with previously offered testimony from Dr. Wang and Mr. Draper regarding such data. *See* Tr. 432-33; 630-31. Specifically, Dr. Wang testified that he was informed by a source with IDNR that the City of Armstrong Wastewater Treatment Plant does not have a water flow or depth gauge, and instead relies upon information from a site approximately 25 miles Southeast in Dakota City, Iowa to estimate their information. *See* Tr. 630-31. Likewise, Mr. Draper testified that he was unable to corroborate data obtained from monthly reports of the City of Armstrong Wastewater Treatment Plant with nearby stream gauges, and was informed by an inspector with IDNR that such data may not be reliable. *See* Tr. 432-33. In consideration of such testimony, Mr. Hentges acknowledged in his testimony that he assumed the City of Armstrong Wastewater Treatment Plant data was collected on-site in relying upon it, and that this may not have been a sound assumption. *See* Tr. 1259-60. Nevertheless, as discussed below, Mr. Hentges maintained his position that the outlet of the tile drainage system for the Riverview Facility was submerged on the date of the 2014 Inspection in his testimony based on observations from his May 2018 Site Visit. *See infra* at 40; Tr. 1157-58.

In his review of that materials from the 2016 Inspection in his report in RX 2, Mr. Hentges primarily addresses the results of water quality testing of samples during this inspection. *See* RX 2 at 5-6. Mr. Hentges notes in his report that certain contaminants identified in water samples from the 2016 Inspection have sources other than runoff from feedlots. *See* RX 2 at 5-6. For example, Mr. Hentges advised that E. coli may be attributable to various animals not associated in agricultural operations or the presence of E. coli in sand and soil,[52] RX 2 at 5, and that ammonia may be associated with decaying organic material and fertilizers applied to soil, RX 2 at 6. Additionally, Mr. Hentges asserted the "low concentrations" of nitrate and nitrite found in Samples 3-7 from the 2016 Inspection, indicates that such samples were not likely the product of runoff from feedlots or the Manure Pit. RX 2 at 6. Likewise, Mr. Hentges concluded that "low concentrations" of total kjeldahl nitrogen and ammonia, along with "high concentrations" of nitrate and nitrite in Samples 8 and 9 from the 2016 Inspection, taken at the location of the tile drain outlet, indicates that "the source of these parameters was likely oxidized

[51] Although it does not appear that Mr. Hentges supplied these monthly operating reports for the City of Armstrong Wastewater Treatment Plant with his report in RX 2, these reports appear to be in RX 5.

[52] Notably, in his testimony, Mr. Hentges clarified that with regard to including information regarding other animal sources of E. coli, he did not intend to indicate that E. coli found in water samples from the Riverview Facility was from these other sources. *See* Tr. 1250.

nitrogen that was applied in the farm fields and picked up by storm water, then percolating through the soil profile into the drain field system." RX 2 at 6.

Addressing Complainant's Modeling Evidence in his report in RX 2, Mr. Hentges concludes that such modeling evidence is insufficient to establish that process wastewater runoff from the Riverview Facility discharged to the East Fork of the Des Moines River, because such a contention "remains unsubstantiated without samples of the runoff that actually reached a water of the US showing a violation." RX 2 at 2; *see also* RX 2 at 6 (restatement of this position). Further, in his brief discussion of Complainant's Modeling Evidence in RX 2, Mr. Hentges notes that modeling must be calibrated based upon site-specific information, RX 2 at 1, and he claims that Complainant's Modeling Evidence did not include such site-specific calibration and only applied "average values" based upon literature as calibrated inputs, RX 2 at 2. In this discussion of Complainant's Modeling evidence in RX 2, Complainant notably did not discuss the models employed in Complainant's Modeling Evidence, or the reliability of such models. *See* RX 2. Additionally, the only specific modeling input identified in Mr. Hentges' discussion of Complainant's Modeling Evidence was Dr. Wang's calculation of the Manure Pit capacity, which Mr. Hentges incorrectly states "assumed only one-quarter of the manure storage was available." RX 2 at 2. Otherwise, Mr. Hentges did not elaborate in his report regarding his analysis of the inputs employed in Complainant's Modeling Evidence, or how he concluded that such inputs were insufficiently calibrated to the Riverview Facility. *See* RX 2 at 1-2, 6 (discussion of Complainant's Modeling Evidence in report in RX 2). Nevertheless, Mr. Hentges concludes in his report in RX 2 that such modeling evidence is insufficient to establish the alleged violations at issue in this matter. RX 2 at 2, 6.

May 2018 Site Visit

Following his report in RX 2, Mr. Hentges performed a site visit of the Riverview Facility and outlet to the tile drainage system at the Riverview Facility on May 22, 2018 ("May 2018 Site Visit"), along with Respondents and Respondents' counsel in this proceeding. *See* Tr. 972, 1009-10, 1150-51, 1155. During this site visit, Mr. Hentges observed the outlet of the tile drain system for the Riverview Facility, and in his testimony, he discussed photographs taken of the tile drain outlet, contained in RX 24-25. *See* Tr. 1150-1152. Specifically, Mr. Hentges observed that the tile drain outlet was submerged during the May 2018 Site Visit, and he reported that grass placed on top of the surface of the water at the location of the tile drain outlet, for purposes of determining water flow, did not appear to move significantly over the course of 15 minutes, as depicted in the photographs in RX 24, captured earlier, and RX 25, captured later, in the May 2018 Site Visit. *See* Tr. 1152-53; *see also* Tr. 1010 (testimony from Respondent Josh Brown regarding this observation during the May 2018 Site Visit). Mr. Hentges testified that to further ascertain the flow of water from the tile drain outlet during the May 2018 Site Visit, Respondent Josh Brown placed his hand in front of the tile drain outlet, as depicted in the photograph in RX 26, *see* Tr. 1152, RX 26; and notably Respondent Josh Brown testified that he was unable to feel flowing water from the tile drain outlet at this time, *see* Tr.1009-10. Likewise, Mr. Hentges testified that Respondent Tony Brown put his hand in front of the tile drain outlet when it was submerged on another occasion in 2018, as depicted in RX 41, and that he also reported that he did not feel water flowing out of the submerged outlet. *See* Tr. 1152-52; RX 41. Such testimony was consistent with Respondent Tony Brown's testimony that in the

photograph in RX 41, taken on October 11, 2018, he placed his hand in front of the tile drain outlet and did not feel any water coming out from this area. Tr. 921, 923-24. From such observations of the tile drain outlet for the Riverview Facility, Mr. Hentges opined that there was no flow through the tile drain outlet on the observed occasions as the tile drain outlet was submerged. *See* Tr. 1153-54.

Additionally, during the May 2018 Site Visit, Mr. Hentges reported viewing the water level of the East Fork of the Des Moines River from the 200th Street Bridge. *See* Tr. 1155-56. Mr. Hentges indicated that the photograph in RX 27 reflects what he observed from the 200th Street Bridge, viewing the East Fork of the Des Moines River facing north, during the May 2018 Site Inspection. *See* Tr. 1155. Comparing this photograph, in RX 27, to a photograph from the 200th Street Bridge, facing north in CX 1.5 at 39, taken during the 2014 Inspection, Mr. Hentges concluded that the water level was higher during the 2014 Inspection than it was during his May 2018 Site Visit, based upon the distance of the water from a branch of a tree located on the right side of both photos, and the apparent turbidity of the water in the photograph from the 2014 Inspection. *See* Tr. 1156-1157. From this conclusion, Mr. Hentges further stated that he presumed the tile drain outlet would have been submerged during the 2014 Inspection, because of his aforementioned observations regarding photographs of the 200th Street Bridge taken during the 2014 Inspection and his May 2018 Site Visit, and the fact that he observed the tile drain outlet to be submerged on the date of his May 2018 Site Visit. *See* Tr. 1157- 58. Later in his testimony, however, Mr. Hentges acknowledged differing vegetation appearing in the photographs of the 200th Street Bridge taken during the 2014 Inspection and his May 2018 Site Visit, and he acknowledged that vegetation may have changed between photographs. *See* Tr. 1263-64.

Additional Analysis in Testimony

As noted, at hearing, Mr. Hentges discussed his analysis in his report in RX 2, as well as his observations and conclusions regarding his May 2018 Site Visit. However, in his testimony, he also offered an additional theory regarding flow from the tile drainage system at the Riverview Facility and more detailed critique Complainant's Modeling Evidence not previously included in his report in RX 2. With regard to his additional theory regarding the flow of the tile drainage system at the Riverview Facility, in his testimony, Mr. Hentges offered the possibility that the tile drainage system at the Riverview Facility had a plug occluding runoff from exiting the tile drain outlet. *See* Tr. 1140-50, 1255-56. Mr. Hentges referenced that Respondents had removed a portion of line from the tile drainage system following the period of alleged violations, as reflected by the circled area on the tile line map in RX 31, *see* Tr. 1140-42; RX 31, and he otherwise noted that Respondents observed sediment in this portion of the tile line removed, as depicted in the photograph in RX 33, *see* Tr. 1140-41; RX 33. Based upon this observation of sediment in a portion of tile line in the tile drainage system at the Riverview Facility, and his experience with aging tile lines deteriorating over time, Mr. Hentges opined that the tile drainage system at the Riverview Facility could have been occluded. *See* Tr. 1141-45. However, Mr. Hentges acknowledged in his testimony that he could not state with any certainty as to whether the tile line for the tile drainage system at the Riverview Facility was plugged at any location. Tr. 1256.

Additionally, in his testimony, Mr. Hentges reported that he was present at the hearing for Dr. Wang's testimony, Tr. 1122, 1127-28, and he provided a more detailed critique of Complainant's Modeling Evidence than he previously included in his report in RX 2. In his discussion of Complainant's Modeling Evidence in his testimony, Mr. Hentges identified that this evidence used the HEC-RAS and Curve Number Method models, *see* Tr. 1168, and advised that he has used both models, Tr. 1168, 1232. However, Mr. Hentges indicated that only a minority of his work involves modeling involving runoff, *see* Tr. 1209, and he acknowledged that he has never modeled runoff from a feedlot, *see* Tr. 1205. Additionally, with regard to the Curve Number Method, Mr. Hentges admitted that he reviews material from the NRCS when conducting this modeling, because, as he stated, "[i]t's not like I do it every day." Tr. 1219. Mr. Hentges also expressed general distrust of the use of modeling as evidence in an enforcement context, *see* Tr. 1171-72, and he identified several cases in which he provided criticism regarding use of modeling, *see* Tr. 1205.

With regard to his impression of Complainant's Modeling Evidence, Mr. Hentges reported that after participating in the May 2018 Site Visit and hearing Dr. Wang's testimony, he maintains the opinion expressed in his report in RX 2 that Complainant's Modeling Evidence is insufficient to establish the alleged violations at issue in this matter. Tr. 1125-28; *see also* RX 2 at 2, 6. Consistent with his report in RX 2, Mr. Hentges opined in his testimony that Dr. Wang did not calibrate Complainant's Modeling Evidence to be site-specific to the Riverview Facility. *See* Tr. 1173, 1213. Notably, he stated that it was his understanding that Dr. Wang "did not use site-specific data for several of the input parameters" in Complainant's Modeling Evidence. Tr. 1173. However, in such testimony he did not identify which elements of Dr. Wang's modeling that he determined were not calibrated to the Riverview Facility, and he further acknowledged that he did not review the materials cited by Dr. Wang in CX 20 and relied upon in Complainant's Modeling Evidence, *see* Tr. 1213-14.

In his testimony, however, Mr. Hentges did identify site-specific information employed by Dr. Wang in Complainant's Modeling Evidence that he found problematic. With regard to the precipitation data employed in the HEC-RAS and Curve Number Method modeling in Complainant's Modeling Evidence, Mr. Hentges noted that there was some discrepancy between the hourly NLDAS radar precipitation data employed in the HEC-RAS modeling and the daily NCDC precipitation data used in the Curve Number Method Modeling. *See* Tr. 1179-80, 1220-21. Likewise, Mr. Hentges stated his opinion that Dr. Wang should have surveyed the area of the Riverview Facility for purposes of determining the watershed area, instead of employing LiDAR data of the site, as it is his understanding that LiDAR has a margin of error of approximately two feet. *See* Tr. 1221-22. Nevertheless, Mr. Hentges acknowledged that he routinely uses LiDAR data, Tr. 1222, and he acknowledged Ms. Heikens used LiDAR data in her watershed calculations for Respondents, *see* Tr. 1223-24. As to Dr. Wang's consideration of soil characteristics and hydrological soil groups in Complainant's Modeling Evidence, Mr. Hentges expressed his opinion that Dr. Wang should have taken core samples to determine soil types instead of relying on soil maps, *see* Tr. 1175-76, 1224-25, even though he acknowledged that the information Dr. Wang applied regarding soil types for Complainant's Modeling Evidence is specific to the Riverview Facility, *see* Tr. 1173. Additionally, Mr. Hentges stated that while Dr. Wang reported Canisteo clay loam is associated with the NRCS soil group of C/D with a group infiltration rate range of 0.0 to 0.15 inches per hour, he found a higher infiltration rate of 0.15 to

2 inches per hour listed for this particular soil on a NRCS affiliated website. Tr. 1174-75, 1225-29; *see also* CX 20 at 15 (Table 15) (identifying this soil type and its hydrologic soil group and associated infiltration rate). However, Mr. Hentges notably did not supply the information he referenced in his testimony,[53] and he conceded that a NRCS soil group classification of C or D is "probably right" for this soil, Tr. 1227. Finally, although Mr. Hentges did not take issue with Dr. Wang's calculations with regard to Swale capacity, he noted that he believed the Figure 15 in Dr. Wang's report in CX 20 was misleading in appearance, since this figure depicts the contour area of the Swale for both field and road grade conditions, but only runoff in the Swale at the elevation of the tile drain inlet for these conditions would drain into the inlet. Tr. 1183-85, 1239-41; *see also* CX 20 at 30 (Figure 15). However, in his discussion regarding this depiction of the Swale capacity, Mr. Hentges referenced that the inlet elevation level for both conditions was identified on this figure, *see* Tr. 1183-84, and he otherwise acknowledged that his objection to this depiction would not impact the results of Complainant's Modeling Evidence, *see* Tr. 1184-85.

Although Mr. Hentges did not specifically address Dr. Wang's flow analysis of the tile drainage system at the Riverview Facility in his testimony regarding Complainant's Modeling Evidence, he offered some continued support for the position he offered in his report in RX 2 that water would not have exited the tile drain outlet if the outlet were submerged, though he acknowledged this would be dependent on the difference in head pressure from runoff exiting the tile drain outlet and the river. *See* Tr. 1267, 1269-70. Mr. Hentges acknowledged that he did not cite to a scientific basis or supportive literature for coming to this conclusion in his report in RX 2, but he stated his position that this conclusion was based upon "common sense." Tr. 1267. He further acknowledged that he was not aware what the elevation was for the outlet of the tile drainage system at the Riverview Facility, and otherwise was not aware of the difference in elevation between the tile drain inlet and the tile drain outlet. Tr. 1268. However, consistent with Dr. Wang's flow analysis, Mr. Hentges indicated that tile drainage systems are sloped downhill, *see* Tr. 1269, and he further provided testimony acknowledging that if the head pressure of water exiting the outlet exceeds the pressure exerted by the river in submerged conditions, water would exit the outlet into the river even in such submerged conditions, *see* Tr. 1269-70, 1273-74.

Finally, with regard to his analysis of Complainant's Modeling Evidence in his testimony, Mr. Hentges offered his opinion that Dr. Wang's validation measures were insufficient. *See* Tr. 1186, 1216-17. Specifically, Mr. Hentges suggested that Dr. Wang should have measured runoff from the Riverview Facility and compared his findings to his modeling for verification purposes. Tr. 1186, 1216-17. Mr. Hentges, however, did not expound more specifically on how Dr. Wang would accomplish this in this matter, particularly in consideration of site changes at the Riverview Facility, such as the tile drain inlet being sleeved and blocked the day following the 2014 Inspection. *See generally* Tr. 1186, 1216-17 (Mr. Hentges' discussion of such proposed validation); Tr. 855-65, 860, 963 (discussion regarding tile drain being blocked the day following 2014 Inspection). Further, Mr. Hentges acknowledged that data was collected from the Riverview Facility during the 2014 and 2016 Inspections, Tr. 1219, and

[53] In his testimony, Mr. Hentges acknowledged that this information was also not contained in his report in RX 2, but he indicated that he completed this review after completing his report in RX 2. *See* Tr. 1229-30.

he further acknowledged that he was unaware that Dr. Wang used his modeling for the Riverview Facility for the dates of the 2016 Inspection for purposes of verifying modeling with conditions observed during the 2016 Inspection, *see* Tr. 1244-45.

V. LIABILITY

a. Summary of Parties' Arguments on Liability

i. Complainant's Initial Post-Hearing Brief

The Complaint in this proceeding alleges that Respondents violated Section 301(a) of the CWA, 33 U.S.C. § 1311(a), on a minimum of six occasions over a five-year period from May 10, 2011 to May 10, 2016, through single or multi-day unpermitted discharges of pollutants contained in process wastewater and discharged from the Riverview Facility to the East Fork of the Des Moines River and its tributaries through the tile drainage system at the Riverview Facility. Compl. ¶¶ 34-36. However, as previously discussed, Complainant refined the period of alleged violations to the period from May 10, 2011 through June 18, 2014, and identified that there were 42 days during this period upon which Respondents violated the CWA through unauthorized discharges of process wastewater containing pollutants from the Riverview Facility to the East Fork of the Des Moines River. *See* Compl. I. Br. at 1-2; *see also* Compl. I. Br. at 31 n.40 (more specifically addressing refined period of alleged violations). With regard to these violations, Complainant asserts that it "has met its burden to show that runoff carried pollutants from Respondents' facility through the tile line and into the East Fork of the Des Moines River on forty-two days between May 20, 2011 and June 18, 2014." Compl. I. Br. at 1. Complainant argues that the evidence it has presented establishes a prima facie case for these violations. Compl. I. Br. at 6.

Complainant notes that it is undisputed that Respondents are persons under the CWA, that the East Fork of the Des Moines River is a navigable water as a water of the United States pursuant to the CWA, and that Respondents did not have a NPDES permit during the period of alleged violations. Compl. I. Br. at 6 (citing Answer ¶ 4; JX 1 at ¶ 2). Accordingly, Complainant concludes that the remaining issue in this proceeding is "whether Respondents discharged pollutants to the East Fork of the Des Moines River from a point source." Compl. I. Br. at 6. With regard to this question, Complainant asserts that the evidence it presented establishes that Respondents discharged pollutants from the Riverview Facility to the East Fork of the Des Moines River through the tile drainage system for the Riverview Facility, *see* Compl. I. Br. at 7-40, and further, that the Riverview Facility is a point source as a Medium CAFO, *see* Compl. I. Br. at 40-42.

Complainant argues that it established that Respondents discharged pollutants from the Riverview Facility to the East Fork of the Des Moines River through the tile drainage system, as the evidence it presented establishes that process wastewater in runoff and overflow from the Riverview Facility flowed into the Swale, *see* Compl. I. Br. at 7-19; that pollutants were present in such process wastewater, *see* Compl. I. Br. at 19-24; that this process wastewater entered into the tile drain inlet at the Swale, *see* Compl. I. Br. 24-35; and that the process wastewater exited

the outlet for the tile drainage system into the East Fork of the Des Moines River, discharging pollutants to the East Fork of the Des Moines River, *see* Compl. I. Br. 35-40.

Complainant asserts that it established that process wastewater in runoff and overflow from the Riverview Facility flowed into the Swale both before and after the construction of the Manure Pit during the period of alleged violations, through observations of the Riverview Facility from aerial photographs and the 2014 and 2016 Inspections, as well as modeling evidence from Dr. Wang. *See* Compl. I. Br. at 7-19. For the period of alleged violations prior to the construction of the Manure Pit, Complainant asserts that, consistent with Dr. Wang's analysis of runoff at the Riverview Facility during this time, as reflected in CX 20.3, "runoff from the facility's pens flowed to the [Central Alley], backed-up into Pen 1, and then flowed out of the northern gate of Pen 1 before flowing to the swale." Compl. I. Br. at 11. Complainant argues that this determination regarding the path of runoff from the Riverview Facility prior to the installation of the Manure Pit is consistent with Mr. Draper's review of aerial photographs of the Riverview Facility during the period prior to the construction of the Manure Pit, testimony from Respondent Josh Brown regarding the flow of runoff from the Central Alley to Pen 1, and testimony from Respondent Tony Brown regarding the motivation behind installing the Manure Pit to capture such runoff. *See* Compl. I. Br. at 11-12 (citing Tr. 367-68, 805-06, 1028-29, 831-32). Complainant acknowledges that Respondents reported that the gated area of Pen 1 is sloped south, away from the gate, Compl. I. Br. at 12 (citing 819-21, 998-99), but argues that this is inconsistent with Mr. Draper's observation that the Manure Pit was constructed such that it would capture runoff from Pen 1, Compl. I. Br. at 12 (citing Tr 370-72; CX 52 at 4), as well as the topographical map from Ms. Heikens in CX 55.3 at 1, marked with an arrow pointing northeast in Pen 1, which Complainant asserts reflects that Pen 1 in fact slopes northeast, in the direction of the gate, Compl. I. Br. at 12 (citing Tr. 1111; CX 55.3 at 1). Complainant further asserts that in addition to the wastewater runoff from the Central Alley, uncontrolled wastewater from the Feedstock Storage Area and Northern and Eastern Alleys flowed to the Swale prior to the construction of the Manure Pit. *See* Compl. I. Br. at 12-13. Complainant notes that Respondents acknowledged openings in the walls of the Northern and Eastern Alleys, *see* Compl. I. Br. at 12-13 (citing Tr. 1006-07, 1026), and asserts that testimony from Mr. Urban and Mr. Draper regarding their observations of the Riverview Facility confirm that process wastewater in these areas is directed to the Swale, as well as process wastewater from the Feedstock Storage Area, *see* Compl. I. Br. at 12-13 (citing Tr. 103, 110, 164-65, 167-68, 347-48, 350, 360, 364, 367-68).

With regard to the period of alleged violations following the construction of the Manure Pit, Complainant asserts that it has established that process wastewater runoff and overflow from the Riverview Facility flowed into the Swale through observations from Mr. Urban and Mr. Draper, testimony from Respondents acknowledging that the Manure Pit overflowed during the 2014 Inspection, photographs taken during the 2014 Inspection, and modeling evidence from Dr. Wang. *See* Compl. I. Br. at 13-19. Complainant notes that Respondents acknowledged in their testimony that the Manure Pit overflowed through the southeast opening in its wall on June 17, 2014, during the 2014 Inspection, *see* Compl. I. Br. at 13-14 (citing Tr. 848, 956, 993), and further that this overflow was also observed by Mr. Urban during the 2014 Inspection, and reflected in the photograph of the Manure Pit from the 2014 Inspection contained in CX 1.5 at 31, *see* Compl. I. Br. at 13-14 (citing Tr. 97, 99, 103; CX 1.5 at 31). Further, Complainant

asserts that observations from Mr. Urban, and photographs taken during the 2014 Inspection in CX 1.5 at 32, CX 29.1, CX 29.3, and CX 29.5, reflect that process wastewater runoff from the Manure Pit flowed east into the Swale. *See* Compl. I. Br. at 14 (citing Tr. 103, 106, 108-09, 316, 319; CX 1.5 at 32; CX 29.1; CX 29.3; CX 29.5). Based upon this observed overflow from the Manure Pit flowing to the Swale during the 2014 Inspection, Complainant reasons that "[i]t is reasonable to conclude that manure pit overflow prior to June 17, 2014 exited the pit through the same southeast opening, which was original to the pit wall just as it did on June 17, 2014." Compl. I. Br. at 14. Likewise, Complainant asserts that evidence from the 2016 Inspection reflects that the Manure Pit did not capture all runoff from the Riverview Facility, and that process wastewater runoff from areas such as the Eastern Alley were not captured by the Manure Pit and otherwise flowed to the Swale. Compl. I. Br. at 13 (citing Tr. 97, 110, 169, 347, 386; CX 8.6 at 56). Complainant further indicates that such observations regarding runoff from areas of the Riverview Facility not received by the Manure Pit is consistent with Ms. Heikens analysis of the watershed area contributing runoff to the culvert area developed by Respondents. *See* Compl. I. Br. at 13 (citing Tr. 1112; CX 55. 3 at 1). As a result, Complainant indicates that based upon such evidence "it is reasonable to conclude that manure pit overflow and runoff from all other uncontrolled areas continued to flow to the swale after construction of the manure pit." Compl. I. Br. at 14.

Complainant further asserts that it established the daily volumes of runoff and overflow contributed to the Swale from the Riverview Facility though the modeling evidence prepared by Dr. Wang. *See* Compl. I. Br. at 15-19. Complainant notes that Dr. Wang calculated daily runoff and overflow from the Riverview Facility for both the period prior to the construction of the Manure Pit, in which runoff from the pens was contained in the Central Alley, and the period following construction of the Manure Pit, accounting for the capacity of this structure, as reflected in his calculations regarding such volumes for the period of alleged violations in CX 20.2 at 66-109. *See* Compl. I. Br. at 18. Specifically with regard to Dr. Wang's calculations of overflow from the Manure Pit, Complainant asserts that Dr. Wang conservatively calculated the capacity of the Manure Pit in favor of reducing the number of overflow events, by applying a 10-foot depth, 20 percent larger than the 8-foot observed depth, and applying a higher evaporation rate than that recommended by literature. Compl. I. Br. at 17 (citing Tr. 571, 609; CX 20 at 11; CX 20.2 at 4, 65). Complainant further argues that its reliance on modeling evidence from Dr. Wang is appropriate, as "[h]ydrologic modeling can serve as circumstantial evidence of discharges and other material facts in cases brought under the CWA." Compl. I. Br. at 15 (citing *San Pedro Forklift, Inc.*, 15 E.A.D. 838 (EAB 2013); *Leed Foundry,* 2007 WL 2192945, at *19-20 (EPA ALJ, Apr. 24, 2007)). Further, Complainant argues that the modeling evidence prepared by Dr. Wang is reliable, as the Curve Number Method employed by Dr. Wang is widely used and inherently conservative, *see* Compl. I. Br. at 16, and the particular modeling inputs used by Dr. Wang were site-specific and conservative in favor of resulting in lower contributions of runoff and overflow from the Riverview Facility to the Swale, *see* Compl. I. Br. at 16-17. Specifically addressing Dr. Wang's use of the NCDC daily rainfall data from the Swea City, Iowa rain gauge station in his Curve Number Method modeling, Complainant argues that such data is the "most accurate, reliable, and site-specific data set available," for the Riverview Facility. Compl. I. Br. at 17. Additionally, Complainant asserts that Dr. Wang's calculations regarding the runoff and overflow contributed to the Swale from the Riverview Facility were calibrated to, and verified by, observations during the 2014 and 2016 Inspections of the

Riverview Facility, Compl. I. Br. at 18 (citing Tr. 602-04, 623; CX 20.2 at 1), and further bolstered by Dr. Wang's April 2018 Site Visit and peer review of his modeling, Compl. I. Br. at 18 (citing Tr. 623, 633).

Complainant additionally asserts that is has established that the process wastewater entering the Swale from the Riverview Facility contained pollutants. *See* Compl. I. Br. at 19-24. Complainant argues that the definition of process wastewater and pollutants within the regulations pertaining to the CWA "make clear that pollutants are present in process wastewater and that any runoff or overflow from a production area is process wastewater, which includes spillage or overflow from manure pits and any stormwater that comes into contact with manure, feed or bedding." Compl. I. Br. at 19. Likewise, Complainant references testimony from Mr. Draper and literature in CX 22, CX 23, CX 24, and CX 25, discussing common pollutants in runoff from CAFOs. Compl. I. Br. at 19-20 (citing Tr. 290-94; CX 22; CX 23; CX 24; CX 25). Further, Complainant asserts that such common pollutants associated with CAFOs, including high levels of E. coli, ammonia, and suspended solids, were present in samples of process wastewater collected from the Riverview Facility in the 2014 and 2016 Inspections. Compl. I. Br. at 20. Specifically, Complainant notes that Sample 1 from the 2014 Inspection, which was taken from the inlet to the tile drainage system at the Swale, revealed high levels of E. coli, suspended solids, nutrients, and biological oxygen demand. Compl. I. Br. at 20 (citing CX 1 at 11). Complainant also cites to testimony from Mr. Urban that he observed the Manure Pit and Northern and Eastern Alleys contribute process wastewater to the Swale during the 2014 Inspection, and that process wastewater generating materials were observed in the Northern and Eastern Alleys, as well as the visible process wastewater runoff to the Swale. Compl. I. Br. at 21 (citing Tr. 100-01, 106-07). Likewise, Complainant asserts that the water quality test results from samples of runoff from the Riverview Facility collected during the 2016 Inspection "show that even a small rainfall event generated uncontrolled runoff from the facility's production area and, without any manure pit overflow, it contained high levels of pollutants." Compl. I. Br. at 22 (citing Tr. 165) (citation omitted). Complainant specifically notes that Sample 3 of the 2016 Inspection was collected from runoff at the Northern and Eastern Alleys, and that testing of this sample reflected substantial amounts of E. coli, very high suspended solids, and high nutrients and biological oxygen demand.[54] Compl. I. Br. at 22 (citing Tr. 165, 167-68, 387, 389; CX 8 at 12). Complainant further argues that the findings of these pollutants in Sample 3 from the 2016 Inspection reasonably relate to runoff from the Northern and Eastern Alleys during the period of alleged violations, given that these structures and the facility practices did not change between this period and the 2016 Inspection. Compl. I. Br. at 22-23

Complainant further argues that both observational and modeling evidence presented establish that the process wastewater from the Riverview Facility entered the inlet to the tile drainage system at the Swale when the capacity of the Swale was exceeded. *See* Compl. I. Br. 24-35. First, Complainant asserts that observational evidence, including review of aerial photographs of the Riverview Facility, and observations of the Swale and tile drain inlet from the 2014 Inspection, establish that process wastewater entered the tile drain inlet in such

[54] Complainant additionally asserts that water quality test results for Samples 1 and 2 from the 2016 Inspection collected from runoff from the Feedstock Storage Area of the Riverview Facility reflect the presence of pollutants such as E. coli and suspended solids, and that such testing results also reasonably relate back to the period of alleged violations for runoff from this area. Compl. I. Br. at 23-24 (citing Tr. 110, 169-70, 312, 379, 884-85; CX 8 at 12).

circumstances. *See* Compl. I. Br. 24-27. Complainant notes that Mr. Draper observed that aerial photographs of the Riverview Facility from April 2011 to March 2015 reflect that the field south of the entryway road from the Swale was well-functioning cropland prior to Respondents' installation of the culvert in the Swale area, and did not reflect visible runoff pathways, such as those observed in an aerial photograph following the installation of the culvert directing water into this field area. Compl. I. Br. at 25 (citing Tr. 346, 356, 362, 373-74; CX 12.13; CX 12.15; CX 12.17; CX 12.34). Complainant suggests that this evidence is consistent with finding that water impounded in the Swale entered the inlet, and did not otherwise convey overland. *See* Compl. I. Br. at 25, 27. Additionally, Complainant argues that Mr. Urban and Mr. Robert's observations of the Swale during the 2014 Inspection support that water in the Swale entered into the tile drain inlet. *See* Compl. I. Br. 26-27. Specifically, Complainant cites to testimony from Mr. Urban and Mr. Roberts that they observed water entering into the tile drain inlet in the Swale from their vehicle upon arrival at the Riverview Facility for the 2014 Inspection, Compl. I. Br. at 26 (citing Tr. 81, 120, 244), as well as their testimony that the water level of the Swale had receded over the course of the 2014 Inspection, Compl. I. Br. at 26 (citing Tr. 123-24, 252-53). Complainant further notes that Mr. Urban reported seeing water being pulled into the intake pipe for the tile drain inlet from the Swale, that he observed seeds on the water in the Swale flowing and being pulled into the intake pipe for the inlet, and that he heard water entering the inlet. Compl. I. Br. (citing Tr. 123-24, 128). Complainant notes that Mr. Urban and Mr. Roberts' observations regarding the Swale and inlet in the Swale from the 2014 Inspection are at odds with testimony from Respondents denying that saw or heard water entering the tile drain inlet during the 2014 Inspection, *see* Compl. I. Br. 26 (citing Tr. 856, 994), but Complainant suggests that such testimony from Respondents is inconsistent with admissions in their Answer, acknowledging that the inlet was observed receiving runoff during the 2014 Inspection, Compl. I. Br. 26-27 (citing Answer ¶¶ 23, 28), as well as written statements from Respondents filed in conjunction with their Response to Complainant's Motion for Accelerated Decision, Compl. I. Br. 27. Complainant further suggests that Respondents' testimony regarding their observations of the Swale during the 2014 Inspection is also inconsistent with a picture submitted to Complainant by Respondents in CX 2 at 3, depicting the Swale the day following the 2014 Inspection, which Complainant asserts reflects a reduced water level in the Swale from the water level observed during the 2014 Inspection. *See* Compl. I. Br. 27 (citing Tr. 155-58; CX 2 at 3).

In addition to the observational evidence Complainant offered in support of its position that process wastewater in the Swale entered into the tile drain inlet, Complainant further asserts that the modeling evidence from Dr. Wang quantified the process wastewater entering the tile drain inlet at the Swale. Compl. I. Br. 28-32. Complainant argues that Dr. Wang's modeling for the Swale under the field conditions accurately establishes the dates upon which the process wastewater entered the Swale, as it asserts this modeling is "accurate to actual conditions." Compl. I. Br. at 30. Complainant further notes that "[t]he results of Dr. Wang's modeling show a total of forty-two days of discharge after taking into account that Respondents blocked the inlet on June 18, 2014 and that one day of discharge would not have occurred without the volume of runoff retained by the central manure alley." Compl. I. Br. at 30 (citing CX 20.3) (citation omitted).[55] Complainant asserts that in calculating the dates upon which process wastewater in

[55] As previously discussed, Complainant's calculation of 42 days of discharge includes the date of June 18, 2014 within this period of alleged violations. *See* Compl. I. Br. at 31 n.40.

the Swale entered the tile drain inlet, Dr. Wang utilized site specific data for the Riverview Facility, including the NCDC daily rainfall data from the Swea City, Iowa rain gauge station; the Swale's watershed area, determined with use of LiDAR and HEC-RAS modeling; and information regarding soil at the Riverview Facility from the NRCS Soil Survey. Compl. I. Br. at 28-29 (citing Tr. 573, 577-78, 581-82, 584, 586-88, 593-94, 598, 649, 661; CX 20 at 28-29; CX 20.2 at 2-3). Additionally, Complainant states that the inputs utilized by Dr. Wang in such modeling were conservative, noting for example, that Dr. Wang applied lower than recommended curve numbers for modeling runoff from the Riverview Facility in the Curve Number Method modeling. Compl. I. Br. at 29 (citing Tr. 598, 602; CX 20 at 16). Complainant further asserts that in addition to using conservative inputs, Dr. Wang further structured his modeling regarding the Swale to be conservative, noting that among other conservative model modifications, Dr. Wang applied higher evaporation and infiltration rates for the Swale and limited the dates used in the modeling to entirely exclude winter months. Compl. I. Br. at 29-30 (citing Tr. 560, 620; CX 20.2 at 65).

In addressing the modeling evidence from Dr. Wang regarding the dates upon which process wastewater from the Swale entered into the inlet of the tile drainage system, Complainant acknowledges Mr. Hentges' critique of such modeling. *See* Compl. I. Br. at 33-35. However, Complainant notes that Dr. Wang used information gathered from the 2014 and 2016 Inspections to verify his modeling results, that he confirmed his modeling inputs through his April 2018 Site Visit, and that his modeling received peer review. *See* Compl. I. Br. at 30-31. In contrast, Complainant suggests that Mr. Hentges' critique of Dr. Wang's modeling is unqualified and inaccurate. *See* Compl. I. Br. at 33. Citing to Mr. Hentges' assertion that Dr. Wang's modeling was not calibrated to be site-specific, Complainant asserts that this statement is inconsistent with testimony from Mr. Hentges acknowledging that Dr. Wang calibrated his model based upon observations from the 2014 Inspection. Compl. I. Br. at 33 (citing Tr. 1213, 1242; RX 2 at 1). Further, Complainant suggests that Mr. Hentges was generally ill-informed regarding Dr. Wang's modeling, citing to testimony from Mr. Hentges in which he acknowledges that he did not read the literature cited by Dr. Wang in his report in CX 20, Tr. 1212-14; he was unaware of whether or how Dr. Wang used information from the 2016 Inspection to validate his modeling, Tr. 1242-45; he could not recall local runoff ratio studies Dr. Wang employed to verify his modeling, Tr. 1214-16; and he was uncertain regarding how Dr. Wang accounted for infiltration in his modeling, Tr. 1238. Compl. I. Br. at 33-35. With regard to Mr. Hentges' critique of Dr. Wang's modeling, Complainant further argues that:

> Mr. Hentges clearly did not read Dr. Wang's report and addendums closely or listen to Dr. Wang's testimony closely as he could not recall how Dr. Wang selected input parameters, including how he identified soil types at the site, what curve numbers were used, what information was used for soil moisture data, or how the model accounted for evaporation or infiltration, which were all site-specific and conservative values.

Compl. I. Br. at 34 (citing Tr. 1230-38). Complainant further questions Mr. Hentges' assertions that Dr. Wang should have used data from a land survey instead of LiDAR, and employed soil sample testing instead of soil data from NRCS, noting that Mr. Hentges conceded that he would

not suggest Ms. Heikens employ a land survey in her work for Respondents, and otherwise arguing that the soil data from NRCS employed by Dr. Wang is nevertheless site-specific and reliable despite Mr. Hentges' preference for soil sample collection. Compl. I. Br. at 34 (citing Tr. 652, 1175-76, 1224, 1231-32). Accordingly, Complainant indicates Dr. Wang's modeling evidence, such as his modeling regarding the dates upon which process wastewater in the Swale entered the tile drain inlet, is not discredited by Mr. Hentges' critique. *See* Compl. I. Br. at 33-35.

Turning to the question of whether process wastewater entering the inlet at the Swale exited the outlet for the tile drainage system into the East Fork of the Des Moines River, and discharged pollutants into the East Fork of the Des Moines River, Complainant asserts that the evidence it presented confirms that process wastewater did indeed exit the outlet for the tile drainage system into the East Fork of the Des Moines River, and in doing so, discharged pollutants. *See* Compl. I. Br. 35-40. Complainant notes that Respondents stipulated that the tile drainage system at the Swale traveled from the inlet location beneath the ground surface to the south, to an outlet on the north bank of the East Fork of the Des Moines River. Compl. I. Br. at 36 (citing JX 1 ¶3). Likewise, Complainant asserts that tile drainage maps from Respondents and from the county in which the Riverview Facility is located reflect that the outlet for this tile drainage system flowing to the East Fork of the Des Moines River existed prior to 2011, and throughout the period of alleged violations. *See* Compl. I. Br. at 36 (citing CX 1.10). Complainant states that the outlet location for the inlet to the tile drainage system at the Swale was identified, observed, and photographed during the 2016 Inspection, Compl. I. Br. at 36 (citing CX 8.6 at 38, 39, 40), and that an accurate tile line path is depicted in the map a CX 8.7 at 2, Compl. I. Br. at 36 (citing Tr. 404-08, 174-75; CX 8.7 at 2). Complainant further asserts that LiDAR data reflects that the elevation of the tile drain inlet, at 1231 feet, is higher than the elevation of the outlet, at 1196 to 1197 feet, Compl. I. Br. at 36 (citing Tr. 624; CX 33 at 2-3; CX 45), and argues that this elevation differential would cause water in the tile drainage system to flow to the outlet location, Compl. I. Br. at 36 (citing Tr. 329-31). Additionally, Complainant indicates that Mr. Urban and Mr. Draper's observations during the 2016 Inspection, that the outlet is approximately 5 to 6 feet higher in elevation than the East Fork of the Des Moines River, and is located 40 yards from the bank of the river, support that process wastewater entering the tile drainage system at the Swale would discharge to the East Fork of the Des Moines River. *See* Compl. I. Br. at 36 (citing Tr. 175, 406-07).

Complainant otherwise argues that the evidence of record demonstrates that the tile line was functioning and that the outlet discharged to the East Fork of the Des Moines River during the alleged period of violations, and further that process wastewater discharging to the river contained pollutants. *See* Compl. I. Br. 37-40. Complainant argues that if the tile drainage system were not functioning, this would have resulted in visible consequences such as ponding, crop distress, and erosional features, which it asserts are not present in aerial photographs of the facility during the period of alleged violations. Compl. I. Br. 37-38 (citing Tr. 299, 416-17). While acknowledging that Respondents submitted photographs in RX 32 and RX 33 of tile line in which they purport contains sediment, Complainant cites to testimony from Respondent Tony Brown in which he stated that he was not asserting that the tile drainage system was completely clogged, and admitted that the tile line depicted in RX 33 does not show complete blockage but rather restriction. Compl. I. Br. at 38 (citing Tr. 904-05, 908; RX 32; RX 33). Likewise,

Complainant references testimony from Dr. Wang and Mr. Hentges discussing how a partially clogged tile drainage line would reduce rate of flow but would not prevent outflow. *See* Compl. I. Br. at 39 (citing Tr. 692, 1277). Complainant also argues that Mr. Urban and Mr. Draper's observation of water flowing from the tile drain outlet during the 2016 Inspection, and the photograph taken of such outflow in CX 8.6 at 39, confirms that the tile drainage system for the inlet at the Swale was functional. *See* Compl. I. Br. at 39 (citing Tr. 175, 406, 900; CX 8.6 at 39). Further, Complainant contends that Dr. Wang and Mr. Draper's observation that submerged grass at the location of the tile drain outlet was seen moving when the tile drain outlet was submerged, reflects that outflow from the tile drain outlet continues when the tile drain outlet is submerged. *See* Compl. I. Br. at 39-40 (citing Tr. 425-26, 629). Even if the outlet could not discharge when submerged, Complainant argues, the process wastewater in the tile drainage system would ultimately flow out of the outlet when the river level receded. *See* Compl. I. Br. at 40 (citing Tr. 1275, 1283). Complainant further asserts that the pollutants present in the process wastewater entering the tile drain inlet in the Swale would remain present in the water discharged from the outlet into the East Fork of the Des Moines River, consistent with testimony from Mr. Draper regarding the persistence of bacteria such as E. coli. Compl. I. Br. at 37 (citing Tr. 291-92). In support of this position, Complainant cites to Dr. Wang's calculations regarding the fate and transport of E. coli in the tile drainage system. *See* Compl. I. Br. at 37 (citing CX 20.1 at 3-4).

Finally, Complainant argues that it has further established that the Riverview Facility is a point source as a Medium CAFO. *See* Compl. I. Br. at 40-42. Complainant notes that Respondents admitted that the Riverview Facility is an animal feeding operation, Compl. I. Br. at 40 (citing Answer ¶¶ 24-26), and further acknowledged that the Riverview Facility "had greater than 300 head of cattle present for 45 days or more in any 12-month period." Compl. I. Br. at 40-41 (citing JX 1 ¶ 1). As a result, Complainant concludes that the Riverview Facility meets the confinement threshold of a Medium CAFO as defined in 40 C.F.R. § 122.23(b)(6)(i)(C). Compl. I. Br. at 41. Additionally, Complainant argues that having established that Respondents discharged pollutants to the East Fork of the Des Moines River through the tile drainage system for the Riverview Facility, it has therefore established that the Riverview Facility meets the definition of a medium CAFO in 40 C.F.R. § 122.23 (b)(6), as the Riverview Facility discharged pollutants into a water of the United States "through a man-made ditch, flushing system, or other similar man-made device," namely, the tile drainage system. Compl. I. Br. at 41-42. While noting that Respondents denied in their Answer that the tile drainage system is a "man-made ditch, flushing system, or other similar man-made device," Compl. I. Br. at 41 (citing Answer ¶ 27), Complainant argues that the tile drainage system falls within this definition, as tile system maps, and testimony from Respondent Tony Brown and Mr. Draper regarding the tile drainage system, reflect that the tile drainage system was man-made, Compl. I. Br. at 41 (citing Tr. 404-06, 409, 891-96; CX 1.10; CX 8.10). Further, Complainant notes that Mr. Urban and Mr. Draper observed that the inlet and outlet of the tile drainage system were constructed from man-made materials. Compl. I. Br. at 41 (citing Tr. 81, 406). As a result, Complainant concludes that it has established that the Riverview Facility is a medium CAFO, and therefore, a point source pursuant to the CWA. *See* Compl. I. Br. at 42. Accordingly, Complainant asserts that it has collectively established the prima facie elements for the alleged violations of the CWA. *See* Compl. I. Br. at 6.

ii. Respondents' Initial Post-Hearing Brief

In their Initial Post-Hearing Brief, Respondents argue that Complainant has failed to meet its burden of proof for the alleged violations and has not established the alleged violations in this matter. *See* Resp. I. Br. at 4, 33. Respondents offer several arguments in support of this position. First, Respondents argue that all circumstantial evidence offered by Complainant in support of establishing the violations should be given little or no weight because of the failure of Mr. Urban and Mr. Roberts to obtain direct evidence from the outlet of the tile drainage system at the Riverview Facility during the 2014 Inspection. *See* Resp. I. Br. at 1-2, 4, 9-12. Next, Respondents argue that Complainant's Modeling Evidence is insufficient to meet Complainant's burden of proof to establish the alleged violations due to unauthorized discharge. *See* Resp. I. Br. at 20-25. Additionally, Respondents contend that evidence presented by Complainant in support of establishing that the Riverview Facility discharged pollutants to the East Fork of the Des Moines River during the alleged period of violations is either not supported or is rebutted by evidence they offered in this proceeding. *See* Resp. I. Br. at 7-9, 15-19, 25-33. Finally, Respondents argue that any discharge of pollutants from the Riverview Facility during the period of alleged violations would have been de minimis, and therefore, not a violation of the CWA. *See* Resp. I. Br. at 33-34.

Respondents argue that all circumstantial evidence of the alleged violations offered by Complainant should be afforded little to no weight because of the failure to collect direct evidence from the outlet of the tile drainage system at the Riverview Facility during the 2014 Inspection. *See* Resp. I. Br. at 1-2, 4, 9-12. Respondents assert that,

> [T]here can be no dispute that if EPA inspectors on [June 17, 2014] had simply went to the river to at least make an effort to locate the tile outlet and if they could locate it, determine if they could observe and sample any discharge, this case would have been resolved. In other words, if the EPA inspectors would have just properly done their job on that day we would have either known if there was a discharge from Riverview Cattle in violation of the Clean Water Act. Because of that failure, we do not know and are left to spend countless hours and resources evaluating circumstantial evidence.

Resp. I. Br. at 1. Respondents acknowledge that, as discussed by the Environmental Appeals Board ("EAB") in *Lowell Vos Feedlot*, 15 E.A.D. 314 (EAB 2011), circumstantial evidence can be used to establish material fact in the absence of direct evidence. Resp. I. Br. at 4 (citing *Lowell Vos Feedlot*, 15 E.A.D. at 322). However, Respondents argue that

> In this case, the sole reliance on circumstantial evidence was of EPA's choosing, not because there was an absence of direct evidence. EPA had every opportunity to attempt to collect direct evidence to prove a discharge during their inspection on June 17, 2014 but did not take that opportunity. Thus, circumstantial evidence in this case should be given little if any weight.

Resp. I. Br. at 4. Respondents suggest that because inspectors could have obtained direct evidence of a discharge in this proceeding during the 2014 Inspection, this matter is distinguishable from cases such as *Lowell Vos Feedlot*, where inspectors were not present at a facility during a discharge event. *See* Resp. I. Br. at 4 (citing *Lowell Vos Feedlot*, 15 E.A.D. at 324). Respondents reject testimony from Mr. Urban and Mr. Roberts that they did not locate, observe, and sample the outlet of the tile drainage system at the Riverview Facility during the 2014 Inspection due to wet field conditions, the unknown location of the outlet, inaccessibility concerns, and concerns regarding sample holding time. *See* Resp. I. Br. at 9-10 (citing Tr. 138, 141, 191, 193, 248, 261-62). Instead, Respondents cite to testimony from Respondents and Gary and Dawn Brown stating that Mr. Urban reported being too fat and lazy to obtain samples from the outlet of the tile drainage system near the East Fork of the Des Moines River during the 2014 Inspection. *See* Resp. I. Br. at 10 (citing Tr. 764-67, 783, 864-65, 996). To further rebut the testimony from Mr. Urban and Mr. Roberts regarding their reasons for not locating, observing, and sampling the outlet to the tile drainage system, Respondents further reference testimony from Respondent Tony Brown stating that Respondents reported that the tile line ran south to the Des Moines River, that he could have requested permission from his neighbor to investigate the location of the tile drain outlet, and that the field conditions would not have made it difficult or dangerous to locate the tile drain outlet. *See* Resp. I. Br. at 9-10 (citing Tr. 861-62). Likewise, Respondents refute testimony from Mr. Roberts and Mr. Urban regarding Mr. Roberts' boot being pulled off in mud during the inspection, noting that Respondents and Gary Brown were present for this portion of the 2014 Inspection, and citing to testimony that they did not observe this event. Resp. I. Br. at 11 (citing Tr. 764, 862, 997). As a result, Respondents argue that Mr. Urban and Mr. Roberts could have obtained direct evidence from the tile drain outlet during the 2014 Inspection, and suggest that the failure to do so constituted a failure to conduct a proper inspection. *See* Resp. I. Br. at 4. In support of this argument, Respondents further cite to testimony from Ms. Benson reflecting that it is IDNR protocol to sample at the location of a potential discharge, Resp. I. Br. at 11-12 (citing Tr. 1037-39), and testimony from Mr. Hentges reflecting his opinion that the tile drain outlet should have been observed during the 2014 Inspection, Resp. I. Br. at 12 (citing Tr. 1154). Asserting that Mr. Urban and Mr. Roberts failed to conduct a proper investigation, Respondents urge that all circumstantial evidence should be given little or no weight as a result in this proceeding. *See* Resp. I. Br. at 4, 12.

In addition to arguing that the circumstantial evidence presented by Complainant should be given little or no weight because of the failure to collect direct evidence from the outlet of the tile drainage system at the Riverview Facility during the 2014 Inspection, Respondents also argue that Complainant's Modeling Evidence is insufficient to meet Complainant's burden of proof to establish the alleged violations due to unauthorized discharges. *See* Resp. I. Br. at 20-25. Respondents suggest two bases for this assertion. First, Respondents generally argue that use of modeling evidence is inherently problematic in enforcement proceedings and may not be sufficient to satisfy the requisite standard of proof. *See* Resp. I. Br. at 20-21, 23. Additionally, with specific regard to Complainant's Modeling Evidence, Respondents challenge certain inputs and calculations used by Dr. Wang in this modeling, assert that such evidence is highly dependent upon inputs selected, and otherwise argue Dr. Wang did not collect sufficient data from the Riverview Facility to verify this modeling evidence. *See* Resp. I. Br. at 22-25.

With regard to the use of modeling evidence, such as Complainant's Modeling Evidence, in enforcement proceedings, Respondents argue that reliance on such evidence is inherently problematic and may not be sufficient to satisfy the requisite standard of proof. *See* Resp. I. Br. at 20-21, 23. Respondents' suggest that such modeling evidence consists of prediction, but does not reflect evidence of actual discharge events. *See* Resp. I. Br. at 21, 23. Respondents state that "[w]hile the Riverview Cattle recognizes that, in certain circumstances hydrologic modeling has been allowed as circumstantial evidence of discharges, that does not mean that the evidence can carry the burden of proof." Resp. I. Br. at 21 (citing *San Pedro Forklift*, 15 E.A.D. 838; *Leed Foundry*, 2007 WL 2192945, at *19-20). Respondents argue that none of the cases relating to this subject matter have determined "whether such information alone is sufficient to satisfy the government's burden." Resp. I. Br. at 21. In support of this position, Respondents reference testimony from Mr. Hentges expressing a critical opinion of use of modeling evidence in enforcement proceedings. Resp. I. Br. at 21-23 (citing Tr. 1170-71, 1232). Specifically, Respondents reference testimony from Mr. Hentges in which he discusses modeling in another matter that he characterized as not being calibrated to site-specific data and applying average values in literature, and argues that use of such modeling "to answer specific questions and be with a degree of accuracy you would need to justify a violation of the law it's a bit of a stretch" Resp. I. Br. at 21 (quoting Tr. 1171). Likewise, Respondents note testimony from Mr. Hentges in which he acknowledges his use of the HEC-RAS and Curve Number Method modeling, but states "[i]f you're going to start to determine when people break the law and fine them for it, I would say you use a more sophisticated method, a method based on sampling and documentation." Resp. I. Br. at 23 (quoting Tr. 1232). In response to this, Respondents assert that "Mr. Hentges is correct, modeling should only be used to predict what may happen, not what has happened to look at imposing liability for actions which are not seen but are 'predicted.'" Resp. I. Br. at 23. Respondents further suggest that Mr. Hentges' testimony is bolstered by his considerable applicable field experience, contrary to Complainant's position regarding his qualifications applicable to this matter. *See* Resp. I. Br. at 20-21.

Addressing Complainant's Modeling Evidence specifically, Respondents challenge modeling inputs and calculations used by Dr. Wang regarding runoff flow from the Central Alley to Pen 1, precipitation, and soil. *See* Resp. I. Br. at 22-25, 28-30. Respondents argue that Dr. Wang's calculations in CX 20.3 regarding flow of runoff from the Central Alley to Pen 1 prior to the construction of the Manure Pit are faulty. *See* Resp. I. Br. at 23, 28. In support of this position, Respondents assert that, contrary to Complainant's arguments, Dr. Wang's analysis of runoff from this area does not comport with the topographical map from Ms. Heikens in CX 55.3 at 1, based upon ground point data she collected from the Riverview Facility. Resp. I. Br. at 23 (citing Tr. 1110-11; CX 55.3 at 1); *see also* Resp. I. Br. at 28 (further discussing this topographical map from Ms. Heikens). Further, Respondents cite to testimony from Respondent Josh Brown discussing that the gate area of Pen 1 is sloped 6-8 inches, in support of its position that runoff from the Central Alley would not exit the gate area of Pen 1, as reflected in Dr. Wang's analysis in CX 20. 3. *See* Resp. I. Br. at 29-30.

Respondents further contest the modeling inputs employed by Dr. Wang in Complainant's Modeling Evidence regarding precipitation and soil at the Riverview Facility. *See* Resp. I. Br. at 22. With regard to the precipitation data used by Dr. Wang, Respondents cited to testimony from Mr. Hentges noting some disparity between the hourly NLDAS radar

precipitation data employed in the HEC-RAS modeling and the daily NCDC precipitation data used in the Curve Number Method Modeling. *See* Resp. I. Br. at 22 (citing Tr. 1179-80). Respondents further argue that rainfall data from Swea City, Iowa is not accurate with regard to rainfall at the Riverview Facility, citing to testimony from Respondent Tony Brown recounting an occurrence of rainfall at the Riverview Facility when there was no rainfall reported in Swea City. *See* Resp. I. Br. at 6-7 (citing to Tr. 838-40). Likewise, Respondents question soil inputs used by Dr. Wang in Complainant's Modeling Evidence, referencing Mr. Hentges' testimony disputing the specific infiltration rate associated with the Curve Number Method hydrological soil grouping for Canisteo clay loam, and otherwise articulating his opinion that Dr. Wang should have collected core samples from the Riverview Facility for his modeling. *See* Resp. I. Br. at 22 (citing Tr. 1175-76). Respondents suggest that the inputs applied by Dr. Wang in Complainant's Modeling Evidence regarding precipitation and soil render this modeling less reliable. *See* Resp. I. Br. at 22.

Further, as noted, Respondents assert that the modeling in Complainant's Modeling Evidence is highly dependent on the inputs selected, and contend that Dr. Wang did not sufficiently verify such modeling with data collection from the Riverview Facility. *See* Resp. I. Br. at 22-25. Respondents stress that the modeling evidence in Complainant's Modeling Evidence is dependent upon the inputs used. S*ee* Resp. I. Br. at 23, 25. Respondents cite to testimony from Dr. Wang regarding whether Complainant's Modeling Evidence assumed that there was a discharge from the Riverview Facility to the East Fork of the Des Moines River on the date of the 2014 Inspection, which it argues evidences inconsistency that highlights the variable nature of such modeling evidence. *See* Resp. I. Br. at 23-25 (citing Tr. 664-66, 668-69, 689-90). Further, referencing testimony from Mr. Hentges, Respondents argue that Dr. Wang should have collected site rainfall and runoff data from the Riverview Facility to verify his modeling, and suggest that his failure to do so renders such evidence insufficiently verified. *See* Resp. I. Br. at 22 (citing Tr. 1185-86).

In addition to arguing that Complainant's Modeling Evidence is insufficient to meet Complainant's burden of proof in establishing the alleged unauthorized discharges from the Riverview Facility to the East Fork of the Des Moines River, Respondents also argue that evidence offered by Complainant to support such discharges is either not supported or is rebutted by evidence offered by Respondents in this proceeding. *See* Resp. I. Br. at 7-9, 12-19, 25-33. Respondents argue that evidence offered by Complainant in support of its position that process wastewater from the Riverview Facility flowed to the Swale, water in the Swale entered the tile drain inlet, and the tile drain outlet for the tile drainage system at the Riverview Facility discharged process wastewater to the East Fork of the Des Moines River, are not supported or contradicted by evidence supplied by Respondents. *See* Resp. I. Br. at 7-9, 12-19, 25-33.

With regard to evidence offered by Complainant regarding the pathways of process wastewater runoff from the Riverview Facility to the Swale, Respondents argue that evidence regarding the flow of such runoff from the Central Alley and Pen 1, the Manure Pit, the Northern Alley, and the Eastern Alley is either not supported or has been rebutted. *See* Resp. I. Br. at 7-9, 25-33. Respondents note that while Complainant argues that process wastewater contained in the Central Alley flowed into Pen 1 and out of the gate area of Pen 1 into the Swale prior to the construction of the Manure Pit at the Riverview Facility, Respondents testified that the gate area

of Pen 1 is sloped away from gate, preventing runoff through the gate area. Resp. I. Br. at 25-27, 29-30 (citing Tr. 819-20, 998-1000). Respondents assert that this testimony is not inconsistent with testimony from Respondent Josh Brown regarding using manure to block the hole between Pen 1 and the Central Alley to prevent backup from the Central Alley into Pen 1. Resp. I. Br. at 27 (citing Tr. 1028-29). Respondents further argue that Complainant mischaracterized testimony from Respondent Tony Brown regarding the reasons Respondents constructed the Manure Pit. *See* Resp. I. Br. at 28. Respondents argue such testimony does not indicate that there was runoff from the Central Alley, but rather reflects that "[t]he pit was not built because [Respondents] couldn't contain the manure in the central manure alley behind the 4 foot wall, it was built because of the difficulty in handling the sloppier manure and because of the frequency of hauling it." Resp. I. Br. at 28 (citing Tr. 805-06, 831-32).

Likewise, Respondents assert that evidence offered by Complainant regarding the pathways of process wastewater runoff from the Manure Pit, the Northern Alley, and the Eastern Alley are also unsupported or have been rebutted. Contrary to Complainant's position that the Manure Pit overflowed on multiple occasions during the period of alleged violations, Respondents cite to testimony from Respondents and Stephen Madden stating that they have not observed the Manure Pit overflowing aside from the date of the 2014 Inspection. Resp. I. Br. at 7, 33 (citing Tr. 718, 840, 998). Further, Respondents cite to testimony from Ms. Benson regarding her April 2017 Site Visit at the Riverview Facility, in which she noted the Manure Pit receiving runoff but denied that it was overflowing. *See* Resp. I. Br. at 30 (citing Tr. 1051-52). Additionally, Respondents dispute that process wastewater would runoff from the Northern and Eastern Alleys of the Riverview Facility. *See* Resp. I. Br. at 30-33. Respondents note that they provided testimony reflecting that only solid manure was stored in the Northern Alley, and contend that "[f]rom this testimony it is reasonable to conclude that because only solid manure was stored in the [Northern Alley], no manure left the alley through the openings in the northern wall." Resp. I. Br. at 31 (citing Tr. 825-27, 828, 1003). Respondents further cite to testimony from Respondent Tony Brown stating the Northern Alley is sloped to the west. *See* Resp. I. Br. at 7-8 (citing Tr. 844-46, 848-49). As for the Eastern Alley, Respondents note that while Complainant has argued that runoff from the Eastern Alley contains process wastewater, and that photographs of tire tracks near the Eastern Alley support this proposition, that testimony from Respondents reflects that neither manure nor cattle are maintained in the Eastern Alley, and that the feed truck which traverses the area does not drive into manure. Resp. I. Br. at 32- 33 (citing Tr. 815-16). Respondents conclude that "[b]ecause no manure is present in the eastern feed alley, either stored or from the tires of the feed wagon or truck, any process wastewater in that area would be negligible at best. . . ." Resp. I. Br. at 33. Respondents further assert that, as reflected in their testimony, openings in concrete walls of the Manure Pit, Northern Alley, and Eastern Alley were not constructed for the purpose of discharging process wastewater, but were constructed for other purposes. *See* Resp. I. Br. at 7-8, 29-30, 32-33 (citing to Tr. 825-27, 844, 1007).

Respondents argue that evidence offered by Complainant in support of its position that water in the Swale entered the tile drain inlet and that the tile drain outlet for the tile drainage system at the Riverview Facility discharged process wastewater to the East Fork of the Des Moines River are not supported or contradicted by evidence supplied by Respondents. *See* Resp. I. Br. at 7-9, 12-19. Contrary to Complainant's position that water in the Swale entered the tile

drain inlet during the 2014 Inspection, Respondents note their testimony reflects that they did not hear or see water entering the inlet to the tile drainage system in the Swale during the 2014 Inspection, Resp. I. Br. at 8-9 (citing Tr. 856-58, 994-95), and further note testimony from Respondent Tony Brown that grass seeds on the surface of the Swale remained on the surface and that Mr. Urban was able to collect a water sample from the Swale without such seeds, Resp. I. Br. at 9 (citing Tr. 860).

As for Complainant's assertion that the outlet for the tile drainage system at the Riverview Facility discharged process wastewater to the East Fork of the Des Moines River during the period of alleged violations, Respondents argue that Complainant's evidence in support of this position has been rebutted by Respondents' evidence. *See* Resp. I. Br. at 11-19. With regard to Mr. Draper's testimony that Respondent Tony Brown admitted to him during the April 2018 Site Visit that such a discharge occurred, Respondents argue that this testimony is rebutted by testimony from Respondent Tony Brown in which he acknowledged telling Mr. Draper that there was a problem during the 2014 Inspection and that the Manure Pit overflowed, but otherwise denying that he admitted that there was a discharge to East Fork of the Des Moines River during the 2014 Inspection. Resp. I. Br. at 12-13 (citing Tr. 496-98, 502-03, 916-17). Respondents also note that Ms. Benson acknowledged being present for some of the conversation between Mr. Draper and Respondent Tony Brown during the April 2018 Site Visit, and cite to her testimony denying that she heard an admission from Tony Brown regarding a discharge to the East Fork of the Des Moines River or otherwise heard Mr. Draper ask Respondent Tony Brown about such a discharge. Resp. I. Br. at 13-14 (citing Tr. 1040-41). Further, Respondent argues that it is inconceivable that Respondent Tony Brown would have admitted a discharge to the East Fork of the Des Moines River as alleged by Mr. Draper, noting that such an admission would be inconsistent with Respondents' position in this proceeding. Resp. I. Br. at 13.

Respondents further suggest that the evidence they presented indicates that the flow in the tile line may have been reduced by sediment, or that the outlet may have been submerged at the time of alleged discharges to the East Fork of the Des Moines River, and that such evidence contradicts Complainant's position that the tile drain outlet discharged runoff to the river. *See* Resp. I. Br. at 11, 14-19. Respondents clarify that they are not asserting that the tile line for the tile drainage system at the Riverview Facility was plugged. Resp. I. Br. at 14. However, citing to photographs taken by Respondents in RX 32 and RX 33, depicting a portion of tile line removed that contained sediment, as well as testimony from Respondent Tony Brown and Mr. Hentges that sediment would reduce flow in the tile line, Respondents argue that such evidence of sediment in the tile line restricting flow could impact the ability of water to flow out of the tile drain outlet, in a manner aside from simply extending the dates of discharge. *See* Resp. I. Br. at 14-16 (citing Tr. 906, 1277-78). In support of this position, Respondents cite to testimony from Mr. Hentges indicating that water in a tile line that is not discharging may infiltrate the ground. Resp. I. Br. at 17- 19 (citing Tr. 1147-50, 1271-72, 1275-76, 1283-84).

Likewise, regarding the effects of the tile drain outlet being submerged, Respondents cite testimony from Mr. Hentges in which he asserts that there is no evidence that the water at the inlet of the tile drainage system was 30 feet higher in elevation than the outlet, concludes that the water exiting the tile drain outlet was not under 30 feet of head pressure, and otherwise indicates

that given the unknown conditions regarding head pressure and the water level of the river, it is cannot be determined whether water would have exited the tile drain outlet during the period at issue. *See* Resp. I. Br. at 16 (citing Tr. 1272, 1279-80, 1283-84). Respondents further note Mr. Hentges' conclusion that the tile drain outlet was submerged during the 2014 Inspection, based upon his observation that the tile drain outlet was submerged during the May 2018 Site Inspection, and his comparison of the river water level from photographs taken at the 200th Street Bridge taken on both of these occasions. *See* Resp. I. Br. at 11 (citing Tr. 1154-60; CX 1.5 at 39; RX 27).

Additionally, Respondents argue that Dr. Wang and Mr. Draper's observation of the tile outlet during the April 2018 Site Visit is contradicted by testimony from Respondent Tony Brown stating that he did not observe submerged grass nearby the submerged tile drain outlet moving during the April 2018 Site Visit, and otherwise stating that Dr. Wang and Mr. Draper remained on the bank area during this observation. *See* Resp. I. Br. at 17 (citing Tr. 914-15). Likewise, Respondents argue that Dr. Wang and Mr. Draper's reported observations of the tile drain outlet during the April 2018 Site Inspection are contradicted by evidence offered by Respondents regarding observations during the May 2018 Site Visit and Respondents' investigation of outflow at the tile drain outlet on occasions when it was submerged. Respondents refer to testimony from themselves and Mr. Hentges describing their observation that the tile drain outlet did not appear to be discharging while submerged during the May 2018 Site Visit, as well as testimony from these sources, accompanied by photographs taken during the May 2018 Site Visit, reflecting that grass placed on top of the surface of the water at the location of the tile drain outlet did not move significantly over an hour-long period during this visit. *See* Resp. I. Br. at 17 (citing Tr. 917-921, 1009-10, 1150-52; RX 24; RX 25). Further, Respondents cite to testimony from themselves relaying that they both did not feel water flowing out of the submerged tile drain outlet when placing their hands at the end of the outlet on two different occasions in 2018, along with pictures these investigations. *See* Resp. I. Br. at 17 (citing Tr. 921-25, 1009-10; RX 26; RX 41; RX 42). As a result, Respondents argue that it is not a forgone conclusion from the evidence of record that pollutants in water entering the inlet to the tile drainage system would discharge from the outlet of the tile discharge system to the East Fork of the Des Moines River. *See* Resp. I. Br. at 19.

Finally, Respondents argue that even if Complainant established unauthorized discharges of pollutants from the Riverview Facility to the East Fork of the Des Moines River, that any such discharges of pollutants would have been de minimis, and therefore, not a violation of the CWA. *See* Resp. I. Br. at 33-34. In support of this position, Respondents cite to *Hawai'i Wildlife Fund v. County of Maui*, 886 F.3d 737 (9th Cir. 2018), which they argue sets forward a standard for permissible de minimis discharges of pollutants under the CWA. *See* Resp. I. Br. at 3, 33-34 (citing *Hawai'i Wildlife Fund,* 886 F.3d at 749). Respondents acknowledge that *Hawai'i Wildlife Fund* concerns the need for a CWA permit when pollutants originating from a point source are conveyed to navigable waters by a nonpoint source, such as groundwater, a question for which writ of certiorari was granted by the Supreme Court as of Respondents' Initial Post-

Hearing Brief.[56] Resp. I. Br. at 3. Nevertheless, Respondents argue that *Hawai'i Wildlife Fund* establishes a standard for de minimis discharges to be permissible under the CWA, citing specifically to language from this decision in which the Ninth Circuit Court of Appeals in explaining considerations for its determination that the County of Maui was liable for an unauthorized discharge of pollutants conveyed through groundwater, states that for the discharges at issue in that matter "the pollutant levels reaching navigable water are more than de minimis." Resp. I. Br. at 34 (citing *Hawai'i Wildlife Fund,* 886 F.3d at 749). Further, Respondents note that the Ninth Circuit Court of Appeals stated in the *Hawai'i Wildlife Fund* decision that the tribunal "leave[s] for another day the task of determining when, if ever, the connection between a point source and a navigable water is too tenuous to support liability under the CWA." Resp. I. Br. at 34 (referring to *Hawai'i Wildlife Fund*, 886 F.3d at 749). Respondents argue that in this matter, any pollutants discharged from the Riverview Facility were de minimis, and therefore, under this language in *Hawai'i Wildlife Fund* do not constitute violations of the CWA. *See* Resp. I. Br. at 33-34. Further, Respondents contend that

> The facts of this case, such as alleged discharge from feed truck and wagon tire tracks, present the perfect opportunity for the talk of determining that the connection between a point source, the Riverview Cattle feed yard, and a navigable water, the East Fork of the Des Moines River, is too tenuous to support liability under the Clean Water Act.

Resp. I. Br. at 34. In articulating this argument, Respondents acknowledge that "there are no reported cases on the de minimis discharge standard as suggested, but left for another day, in [*Hawai'i Wildlife Fund*]," but argue that such consideration of a de minimis exception to liability for discharges of pollutants under the CWA is further supported by *Kentucky Waterways Alliance v. Johnson*, 540 F.3d 466 (6th Cir. 2008). Resp. I. Br. at 34 (citing *Kentucky Waterways Alliance*, 540 F.3d at 491). Respondents note that in *Kentucky Waterways Alliance*, a case pertaining to a challenge to EPA's approval of Kentucky's water quality antidegradation rules under the CWA, the Sixth Circuit Court of Appeals noted that in the absence of extraordinarily rigid statutory or regulatory language courts recognize an administrative law principle that allows agencies to create unwritten exceptions to a statute or rule for "de minimis" matters. Resp. I. Br. at 34 (citing *Kentucky Waterways Alliance*, 540 F.3d at 491 (quoting *Greenbaum v. EPA*, 370 F.3d 527, 534 (6th Cir. 2004)). Accordingly, Respondents suggest that if Complainant established discharges of pollutants from the Riverview Facility to the East Fork of the Des Moines River in this matter, such discharges were de minimis, and therefore not violations of the CWA. *See* Resp. I. Br. at 33-34.

[56] In a footnote in their Initial Post-Hearing Brief, Respondents suggest that this matter is akin to cases such as *Hawai'i Wildlife Fund,* addressing circumstances in which pollutants may be conveyed to a navigable water through groundwater. *See* Resp. I. Br. at 19 n.6. Specifically, in this footnote, Respondents argue that this matter, like such cited cases, presents "the question of the Clean Water Act's regulation over groundwater." Resp. I. Br. at 19 n.6. However, it is notable that this matter concerns allegations that Respondents discharged pollutants to a navigable water from a point source through a subsurface tile drain system, and not through groundwater.

iii. Rebuttal Arguments

As previously noted, both Complainant and Respondents filed reply post-hearing briefs to their initial post-hearing briefs. In addition to reiterating arguments offered in their initial post-hearing briefs, Complainant and Respondents offered rebuttal arguments in their reply post-hearing briefs to address arguments raised in the initial post-hearing briefs, as discussed below.

A. Complainant's Reply Post-Hearing Brief

In response to the arguments offered in Respondents' Initial Post-Hearing Brief, Complainant offers several rebuttal arguments regarding liability in its Reply Post-Hearing Brief. Among these, Complainant asserts that Respondents' arguments regarding use of circumstantial evidence and modeling evidence misstate the evidentiary standard in this proceeding. *See* Compl. Reply Br. at 4-11. Complainant further reiterates its position that it met its burden of proof in establishing Respondents' liability for the alleged violations of the CWA, and asserts that arguments offered by Respondents in their Initial Post-Hearing Brief to challenge its prima facie case are lacking support. *See* Compl. Reply Br. at 11-28. Finally, Complainant argues that contrary to Respondents' arguments, Respondents' violative conduct is not excused by a defense of good faith or an exception to liability for de minimis discharges of pollutants. *See* Compl. Reply Br. at 1-4.

Complainant takes issue with Respondents' assertion that all circumstantial evidence of the alleged violations offered by Complainant should be given little to no weight, as well as Respondents' argument that modeling evidence is problematic generally in enforcement proceedings and may not be sufficient to satisfy the requisite burden of proof, asserting that both of these arguments misstate the applicable evidentiary standard in this matter. *See* Compl. Reply Br. at 4-11. With regard to Respondents' argument that the all circumstantial evidence of the alleged violations offered by Complainant should be afforded little to no weight because EPA inspectors did not collect direct evidence of a discharge during the 2014 Inspection, Complainant asserts that this argument is not supported by law and is inconsistent with the applicable evidentiary standard for this proceeding. *See* Compl. Reply Br. at 4-8. Complainant acknowledges that it has the burden to establish the alleged unauthorized discharges by a preponderance of evidence. *See* Compl. Reply Br. at 4. Complainant notes that Respondents cited to *Lowell Vos Feedlot* for the proposition that circumstantial evidence may be used in the absence of direct evidence, and in doing so, appeared to suggest that circumstantial evidence may be relied upon only if direct evidence is unobtainable. *See* Compl. Reply Br. at 4 (citing Resp. I. Br. at. 4, 12). However, Complainant argues that this reading is inconsistent with the *Lowell Vos Feedlot* case, and functionally creates a new standard for use of circumstantial evidence that incorporates an "evidence penalty." Compl. Reply Br. at 4. Additionally, countering Respondents' position that the EPA inspectors could have obtained direct evidence from the tile drain outlet during the 2014 Inspection, Complainant asserts that the EPA inspectors provided many good reasons for their inability to collect such evidence, and cites to testimony from Mr. Urban in which he explains that such evidence was not collected due to reasons including wet field conditions, the unknown location of the outlet, inaccessibility concerns, and concerns regarding sample holding time. Compl. Reply Br. at 5-6 (citing Tr. 135-37, 212). Further, Complainant notes that Mr. Urban testified that he did not plan to return to the

Facility the next day to collect this information as the EPA inspectors had other inspections scheduled and otherwise were not convinced field conditions would improve based upon forecasted precipitation. Compl. Reply Br. at 6-7 (citing Tr. 213). Nevertheless, Complainant asserts that "[i]n any event, failure to sample at the tile outlet does not result, as Respondents argue, in a failure to prove the unauthorized discharge." Compl. Reply Br. at 7. Complainant asserts that caselaw reflects that circumstantial evidence can be sufficient to establish unauthorized discharges under the CWA, and otherwise has held that sampling of runoff prior to reaching the discharge location is not required establish the addition of pollutants. Compl. Reply Br. at 7 (citing *Lowell Vos Feedlot*, 15 E.A.D. at 321; *Leed Foundry*, 2007 WL 2192945, at * 69-73; *Envtl. Prot. Info. Ctr. v. Pac. Lumber Co.*, 469 F. Supp.2d 803, 819 (N.D. Cal. 2007)). Accordingly, Complainant concludes that "[t]here is no basis in the law to support Respondents' assertions that circumstantial evidence should not be considered or given any less weight in this case." Compl. Reply Br. at 4-5.

As for Respondents' general assertion that use of modeling evidence is inherently problematic in enforcement proceedings and may not be sufficient to satisfy the burden of proof, Complainant argues that this position is not well supported, and is otherwise not consistent with the applicable standard of proof for this proceeding. *See* Compl. Reply Br. at 8-11. Complainant contends that contrary to Respondents' position, modeling is appropriate and probative evidence for purposes of establishing unauthorized discharges in CWA enforcement proceedings. Compl. Reply Br. at 8. In support of this position, Complainant notes that modeling evidence has been used in numerous cases involving violations of the CWA. Compl. Reply Br. at 8-9 (citing *San Pedro Forklift, Inc.*, 15 E.A.D. at 874; *Service Oil, Inc.*, 2007 WL 3138354 (EPA ALJ, Aug. 3, 2007), *vacated and remanded on other grounds by* 590 F.3d 545 (8th Cir. 2009); *Leed Foundry*, 2007 WL 2192945 at *67; *Special Interest Auto Works, Inc.*, Docket No. CWA 10-2013-0123, Order on Respondents' Amended Motion for Accelerated Decision, at 23 (EPA ALJ, Oct. 13, 2015)). Further, Complainant argues that "[d]espite the clear caselaw affirming the admissibility and probative value of modeling to establish unauthorized discharges, Respondents cite only to Mr. Hentges' testimony to support their assertion that modeling is not appropriate or useful in enforcement cases." Compl. Reply Br. at 9. Complainant contends that Respondents' reliance on Mr. Hentges' testimony critical of the use of modeling evidence in enforcement proceedings is problematic, as it notes that Mr. Hentges has not been deemed an expert in modeling or the evidentiary standard in CWA enforcement proceedings, and asserts that "[t]herefore, he does not have the qualifications or authority to declare that modeling is inappropriate evidence in CWA enforcement cases generally or in this case in particular." Compl. Reply Br. at 10. In response to Respondents' assertion that modeling evidence alone may not be sufficient to satisfy the burden of proof, Complainant argues that this position is not supported, as caselaw makes clear that circumstantial evidence alone is sufficient to prove adjudicative facts, and "modeling is the same as any form of circumstantial evidence." Compl. Reply Br. at 10-11 (citing *Concerned Area Residents for the Env't v. Southview Farm*, 34 F.3d 114, 120 (2d Cir. 1994); *BWX Techs., Inc.,* 9 E.A.D. 61, 78 (EAB 2000)). Additionally, the Complainant asserts that in this matter it is not relying solely on modeling evidence to establish unauthorized discharges in violation of the CWA, but instead is relying on modeling evidence in conjunction with other direct and circumstantial evidence, which is argues is consistent with how modeling has been used in caselaw. *See* Compl. Reply Br. at 11.

Turning to Respondents' argument that Complainant failed to meet its burden of proof in establishing the alleged violations for unauthorized discharges, Complainant reiterates its position that it has met its burden in establishing these violations, and further that the arguments offered by Respondents in their Initial Post-Hearing Brief to challenge its prima facie case are lacking support. *See* Compl. Reply Br. at 11-28. In doing so, Complainant both defends Complainant's Modeling Evidence as accurate and reliable, *see* Compl. Reply Br. 15-20, and more broadly asserts that the collective evidence presented establishes the alleged violations, and that it has satisfied its burden of proof, *see* Compl. Reply Br. at 11-15, 17, 21-28.

With regard to Complainant's Modeling Evidence, Complainant argues that this evidence is accurate and reliable, despite Respondents' arguments to the contrary. *See* Compl. Reply Br. 15. Complainant contends that Respondents' arguments regarding Dr. Wang's inputs for precipitation and soil in Complainant's Modeling Evidence are not adequately supported, and further rejects Respondents' argument that Dr. Wang did not sufficiently verify Complainant's Modeling Evidence with data collection from the Riverview Facility. *See* Compl. Reply Br. 15-20. Complainant argues that the evidence cited by Respondents to refute the reliability of the precipitation data used by Dr. Wang in the modeling fails to undermine the accuracy of this information. *See* Compl. Reply Br. at 15. Complainant asserts that testimony from Respondent Tony Brown supporting anecdotal evidence of rainfall variability is insufficient to establish that such information is inaccurate, and it further argues that Respondents' claim that the Riverview Facility received six inches of rain is also not supported by the evidence, including rainfall information submitted by Respondents in RX 6, RX 7, and RX 8. *See* Compl. Reply Br. at 15-16 (citing Tr. 839-40; RX 6; RX 7; RX8). Complainant argues that Dr. Wang used the best available precipitation data for the Riverview Facility, consistent with standard practice by experts in his field. Compl. Reply Br. at 16 (citing Tr. 584). Likewise, Complainant contends that Dr. Wang's use of two different precipitation data sets in his modeling is consistent with the needs of hourly precipitation data for the HEC-RAS modeling and daily precipitation data for the Curve Number Method modeling, and further, bolsters, rather than undermines, the validity of this data in Complainant's Modeling Evidence. *See* Compl. Reply Br. at 16-17 (citing Tr. 582, 586; CX 20 at 9).

Likewise, Complainant argues that Respondents' arguments regarding the soil inputs used by Dr. Wang in his Curve Number Modeling are unfounded. *See* Compl. Reply Br. at 17-19. Complainant notes that while the Curve Number Method categorizes soils into four groups, that this categorization in this empirical model is based upon the similar infiltration rates of soils in the same grouping, determined from NCRS' field data and observation regarding such soils and runoff. *See* Compl. Reply Br. at 17-18. As such, Complainant asserts that the use of these soil types in the Curve Number Method modeling is not relying on "generic soil data." Compl. Reply Br. at 18. With regard to Respondents' arguments premised upon testimony from Mr. Hentges questioning the infiltration rate associated with the hydrological soil grouping that Dr. Wang applied for Canisteo clay loam in the Curve Number Method modeling, Complainant argues that Dr. Wang applied the correct hydrological soil grouping to for Canisteo clay loam within the Curve Number Method modeling, and that Mr. Hentges' critique is not supported. *See* Compl. Reply Br. at 18-19. Specifically, Complainant asserts that consistent with Dr. Wang's Curve Number Method modeling, the NCRS assigns Canisteo clay loam to the C/D hydrologic group, and notes testimony from Mr. Hentges conceding that classification of Canisteo soil

within the C or D group is "probably right." Compl. Reply Br. at 18-19 (citing CX 20.2 at 2; Tr. 1227). Complainant also notes that Mr. Hentges' critique regarding the infiltration rate for Canisteo clay loam is notably absent from his expert report, Compl. Reply Br. at 18 (citing Tr. 1194-95, 1229-30), and further appears to misunderstand how infiltration is considered through curve numbers in the Curve Number Method, Compl. Reply Br. at 18-19 (citing Tr. 561-62, 617, 1175; CX 20.2 at 1).

Addressing Respondents' contention that Dr. Wang did not sufficiently verify Complainant's Modeling Evidence with data collection from the Riverview Facility, Complainant argues that it has established that Complainant's Modeling Evidence was accurate and appropriately verified. Compl. Reply Br. at 19-12. Complainant argues that Respondents' claim that Complainant's Modeling Evidence is not sufficiently verified ignores that Dr. Wang calibrated the modeling to the Riverview Facility using site-specific data, he applied accurate modeling inputs, and he "followed standard and adequate verification methods." Compl. Reply Br. at 19-20. With regard to inputs Dr. Wang used in his modeling, Complainant asserts that these inputs were conservatively calculated to benefit Respondents, including Dr. Wang's calculations regarding the capacity of the Central Alley in CX 20.3. Compl. Reply Br. at 20. Further, Complainant argues that testimony from Dr. Wang regarding how Complainant's Modeling Evidence accounted for conditions on the date of the 2014 Inspection was not inconsistent, but rather explained how he calibrated the modeling to the observed conditions during the 2014 Inspection, and how adjusting conditions would impact modeling with regard to a discharge to the East Fork of the Des Moines River on this date. *See* Compl. Reply Br. at 20.

Following its defense of Complainant's Modeling Evidence on the basis that such evidence is accurate and reliable, Complainant asserts that the collective evidence presented establishes the alleged violations, and that it has satisfied its burden of proof. *See* Compl. Reply Br. at 11-15, 17, 21-28. Specifically, Complainant argues that the evidence it presented establishes that pollutants from the Riverview Facility flowed to the Swale in process wastewater runoff, *see* Compl. Reply Br. at 11-15, 17; that the process wastewater in the Swale entered the tile drainage system, *see* Compl. Reply Br. at 21-22; and that this process wastewater in the tile drainage system discharged to the East Fork of the Des Moines River from the tile drainage system, *see* Compl. Reply Br. at 22-28.

Complainant first reiterates its position that through the evidence presented it has established that pollutants from the Riverview Facility flowed to the Swale in process wastewater runoff, and Complainant otherwise refutes arguments to the contrary from Respondents. *See* Compl. Reply Br. at 11-15, 17. With regard to Respondents' arguments that process wastewater did not flow from the Central Alley through Pen 1 prior to construction of the Manure Pit as alleged, Complainant argues that this pathway of runoff is consistent with testimony from Mr. Draper regarding his review of aerial photographs of this area prior to the installation of the Manure Pit. *See* Compl. Reply Br. at 12 (citing Tr. 364, 367-68; CX 28.5). Further, Complainant reasserts its position that Dr. Wang's flow analysis of process wastewater runoff in CX 20.3 is consistent with the topographical map from Ms. Heikens in CX 55.3, as it notes that this map from Ms. Heikens reflects conditions present after the Manure Pit was constructed, and asserts the comparative points referenced by Respondents are outside of Pen 1 and reflect such changes to the area with the installation of the Manure Pit. *See* Compl. Reply

Br. at 11-12. Likewise, Complainant asserts that "[i]t is improbable that the central manure alley could retain all of the runoff generated from the pens." Compl. Reply Br. at 13. In support of this, Complainant asserts that Complainant's Modeling Evidence "quantified the amount of runoff from the facility's pens that would have exceeded the accumulation capacity of the [Central Alley]." Compl. Reply Br. at 14 (citing Compl. I. Br. at 18-19). Complainant further argues that this position is, in fact, consistent with testimony from Respondent Tony Brown addressing the reasons for which Respondents constructed the Manure Pit. *See* Compl. Reply Br. at 13 (citing Tr. 805, 831).

Additionally, Complainant argues that contrary to the assertions of Respondents, it has established that process rainwater runoff additionally traveled to the Swale from the Manure Pit, the Northern Alley, and the Eastern Alley. *See* Compl. Reply Br. at 14-15, 17. Complainant contends that Complainant's Modeling Evidence establishes that the Manure Pit overflowed on other occasions in addition to the 2014 Inspection. *See* Compl. Reply Br. at 17. Complainant notes that while Respondents argued that only solid manure was maintained in the Northern Alley, this does not preclude pollutants from being released from this area as solid manure and rainfall generated process wastewater would still be able to flow to the Swale in these conditions. Compl. Reply Br. at 14. Further Complainant suggests that the record has established that process wastewater in this area was not an anomaly observed during the 2014 Inspection, as "EPA observed and sampled runoff from the [Northern Alley] flowing east during the 2016 inspection after just 0.7 inches of rainfall," and determined that such runoff contained high levels of pollutants. Compl. Reply Br. at 14 (citing CX 8 at 3, 12). Likewise, with regard to the Eastern Alley, Complainant asserts that observed tire tracks are not the only source generating process wastewater, and notes "that EPA inspectors observed the feed wagon tracking out manure and spilling feed in uncontrolled areas of the facility during the 2016 inspection, and the sampling results showed pollutants in runoff from these areas." Compl. Reply Br. at 15 (citing CX 8 at 12). As a result, Complainant asserts that it has established that pollutants from the Riverview Facility flowed to the Swale in process wastewater runoff. *See* Compl. Reply Br. at 11-12.

Next, Complainant argues that the evidence presented establishes that the process wastewater in the Swale entered the tile drainage system, and this has not been rebutted by Respondents. *See* Compl. Reply Br. at 21-22. Complainant reiterates its position that the observations of inspectors of water flowing into the tile drain inlet from the Swale supports this position. *See* Compl. Reply Br. at 21 (citing Compl. I. Br. at 24-40). Further, Complainant argues that Respondents, in their Initial Post- Hearing Brief, "ignore[] the many admissions made by Respondents and other evidence that the process wastewater entered the tile line." Compl. Reply Br. at 21. Complainant asserts that in addition to the testimony from Mr. Draper regarding an admission from Respondent Tony Brown during the April 2018 Site Visit, *see* Compl. Reply Br. at 21-22 (citing Tr. 428), Respondents acknowledged that process wastewater entered the inlet during the 2014 Inspection in their Answer at ¶¶ 23, 28, *see* Compl. Reply Br. at 21. Complainant also reiterates its position that the fact that process wastewater in the Swale entered the inlet to the tile drainage system during the period of alleged violations is further supported by Complainant's Modeling Evidence and aerial photographs of the Riverview Facility. Compl. Reply Br. at 22 (citing Compl. I. Br. at 24-25, 28- 35).

Likewise, Complainant asserts that the evidence presented demonstrates that the process wastewater, which entered the tile drain inlet at the Swale, discharged to the East Fork of the Des Moines River from the tile drainage system during the period of alleged violations, and that this has not been contradicted by evidence offered by Respondents to suggest that the tile drainage system was restricted or that such water would be unable to exit the outlet due to submerged conditions. *See* Compl. Reply Br. at 22-28. Complainant notes that in their Initial Post-Hearing Brief, Respondents acknowledge they are not asserting that the tile drain outlet was plugged, and argue that there is no persuasive evidence "that anything prevented the discharge of pollutants to the East Fork of the Des Moines River." Compl. Reply Br. at 22. Complainant contends that evidence offered by Respondents for purposes of suggesting that the tile drainage system was restricted, including the photographs in RX 32 and RX 33, and testimony from Mr. Hentges on this subject, is not supported. Compl. Reply Br. at 22-23. Complainant reiterates its position that the evidence it presented has established that the tile drainage system was functional during the relevant period, including review of aerial photographs of the Riverview Facility throughout the period of alleged violations that do not reflect crop distress or erosion reflective of overland transport of runoff, and Mr. Draper and Mr. Urban's observations of outflow from the tile drain outlet during the 2016 Inspection. Compl. Reply Br. at 23 (citing Compl. I. Br. at 37-38). Complainant further notes that Mr. Hentges admitted in his testimony that he could not say with any certainty whether the tile drainage system was plugged at any location. Compl. Reply Br. at 23 (citing Tr. 1256).

Complainant additionally argues that evidence offered by Respondents to suggest that the tile drain outlet was submerged on the date of the 2014 Inspection, and further, that water would be unable to exit the outlet due to submerged conditions, is not supported by fact. *See* Compl. Reply Br. at 24-28. Complainant argues that the sole basis for Respondents' position that the tile drain outlet was submerged on the date of the 2014 Inspection is Mr. Hentges "unqualified opinion" that the water level of the river was higher in a photograph from the 2014 Inspection than the river level in a photograph taken on a later date upon which the tile drain outlet was observed to be submerged. Compl. Reply Br. at 24 (citing Tr. 1154-60). Complainant also notes testimony from Mr. Hentges discussing his consideration of monthly operating data from the City of Armstrong Wastewater Treatment Plant, in which he acknowledges that he made an incorrect assumption regarding the location of the gauge for this plant, and Complainant further asserts that Mr. Hentges did not even attempt calculations to ascertain whether the tile drain outlet was submerged. Compl. Reply Br. at 25 (citing Tr. 158-160). In contrast, Complainant notes Dr. Wang's calculations regarding the level of the East Fork of the Des Moines River, and asserts that these calculations reflect that the tile drain outlet was not submerged during the 2014 Inspection. Compl. Reply Br. at 25 (citing Tr. 629-30, 636). Additionally, Complainant argues that "[r]egardless of whether and when the outlet was submerged, Mr. Hentges' theory that the submerged outlet would not discharge is unsupported and improbable." Compl. Reply Br. at 25. Complainant suggests that Mr. Hentges' theory is not premised upon a scientific basis, noting that when Mr. Hentges was asked about the basis for this position, he cited that it was premised on common sense. *See* Compl. Reply Br. at 25 (citing 1267). Likewise, Complainant asserts that Mr. Hentges was unable to state under what circumstances the tile drain outlet would and would not discharge. Compl. Reply Br. at 26-27 (citing Tr. 1272-76). Complainant contends that contrary to Mr. Hentges' testimony regarding outflow from the tile drain outlet in submerged conditions, Dr. Wang's testimony was unequivocal "that the tile outlet in this case,

whether or not submerged will discharge." Compl. Reply Br. at 27 (citing Tr. 624-26). Complainant asserts that testimony from Dr. Wang reflects that he verified this conclusion with other experts and reviewed literature, and could not find support for Mr. Hentges' theory regarding the tile drain outlet in submerged conditions. *See* Compl. Reply Br. at 27 (citing Tr. 625-27, 637-38). Further support for Dr. Wang's conclusion that the tile drain outlet will discharge in submerged conditions, Complainant contends, is supplied by Dr. Wang and Mr. Draper's observation of the movement of grass at the tile drain outlet when submerged during the April 2018 Site Visit. Compl. Reply Br. at 27 (citing Compl. I. Br. at 39-40). Complainant argues that these observations are not at odds with the observations of Mr. Hentges and Respondents that they did not observe any movement from grass placed on the surface of the water at the submerged tile drain outlet during the May 2018 Site Visit, as Complainant notes that Mr. Draper reported that the surface of the water was also still during his observations. Compl. Reply Br. at 27 (citing Tr. 426-27, 920, 1010, 1152). With regard to testimony from Respondents about not feeling water flow from the submerged tile drain outlet upon investigations on two different occasions in 2018, Complainant argues this testimony is unsupported by other documented evidence such as video evidence, and suggest that it is self-serving. Compl. Reply Br. at 27-28. However, Complainant ultimately asserts that even if Respondents' assertion that the tile drain outlet would not discharge when submerged is correct, this fact would only remove three dates of discharge from the tile drain outlet pursuant to Dr. Wang's calculations. Compl. Reply Br. at 28 (citing Tr. 631-33, 636-37).

Finally, with regard to Respondents' argument that any established unauthorized discharges of pollutants from the Riverview Facility to the East Fork of the Des Moines River, would have been de minimis, and therefore, not a violation of the CWA, Complainant asserts that this is neither based in law or fact. *See* Compl. Reply Br. at 1-4. Complainant asserts that the CWA "does not recognize a good faith or a de minimis defense to liability." Compl. Reply Br. at 1 (citing *Int'l. Union v. Amerace Corp., Inc.*, 740 F. Supp. 1072, 1083 (D. N.J. 1990)). In response to Respondents' argument that *Hawai'i Wildlife Fund* establishes a de minimis defense, Complainant notes that this case pertains to determining whether discharges of pollutants from injection wells should be considered point source on non-point source pollution under the CWA, and specifically evaluates whether such wells conveyed the pollutants to navigable water and the connection of the point source to the navigable water. Compl. Reply Br. at 2 (citing *Hawai'i Wildlife Fund*, 886 F.3d at 744-49). In contrast, Complainant asserts that

> Here, there is no question that Respondents' facility is a point source and its connection to the navigable waters in this case is not tenuous . . . but rather through a man-made conveyance such that it fits squarely within the regulatory definition of a medium CAFO, explicitly included in the CWA's definition of a point source.

Compl. Reply Br. at 2 (citation to Resp. I. Br. at 34 omitted). Likewise, Complainant asserts that the administrative law principle for de minimis matters discussed in *Kentucky Waterways Alliance*, as cited by Respondents, does not provide a de minimis defense to liability under the CWA. Compl. Reply Br. at 3 (citing *Kentucky Waterways Alliance*, 540 F.3d at 483). On the contrary, Complainant suggests that *Kentucky Waterways Alliance* is inapposite, as this cited case does not address excuses to liability for unauthorized discharges, but rather exemptions

from anti-degredation review for effluent limits in NPDES permits. Compl. Reply Br. at 3 (citing *Kentucky Waterways Alliance*, 540 F.3d at 483). Additionally, Complainant notes that *Kentucky Waterways Alliance* stresses that within this differing context, "this authority to create exemptions in permitting is 'narrow in reach and tightly bounded by the need to show that the situation is genuinely de minimis or one of administrative necessity.'" Compl. Reply Br. at 3 (quoting *Kentucky Waterways Alliance*, 540 F.3d at 483). Furthermore, Complainant asserts that even if there were a de minimis defense to liability for unauthorized discharges of pollutants under the CWA, the facts in this case would not support such a defense, given the high levels of pollutants detected in water quality testing of samples from the process wastewater runoff at the Riverview Facility. Compl. Reply Br. at 3 (citing CX 1 at 11; CX 8 at 12; Compl. I. Br. at 20-24, 44-47).

B. Respondents' Reply Post-Hearing Brief

In their Reply Post-Hearing Brief, Respondents reiterate their assertion that all circumstantial evidence offered by Complainant in support of establishing the violations should be given little or no weight due to the failure to collect direct evidence of a discharge from the tile drain outlet during the 2014 Inspection, and add additional arguments in support of this position. *See* Resp. Reply Br. at 2-8. Additionally, Respondents reassert that Complainant's Modeling Evidence is insufficient to meet Complainant's burden of proof in this matter, *see* Resp. Reply Br. at 5-6, 9-12, and further, that Complainant has more broadly failed to meet its burden of proof to establish the alleged violations in this matter, *see* Resp. Reply Br. at 2-3, 8-9, 12-12. Finally, Respondents counter Complainant's argument that the alleged discharges are not permissible under the CWA as de minimis discharges of pollutants. *See* Resp. Reply Br. at 14-15.

As noted, in their Reply Post-Hearing Brief, Respondents invoke the argument offered in their Initial Post-Hearing Brief that all circumstantial evidence offered by Complainant in support of establishing the violations should be given little or no weight due to the failure to collect direct evidence of a discharge from the tile drain outlet during the 2014 Inspection. *See* Resp. Reply Br. at 2-8. In reasserting this argument, Respondents note that "U.S. EPA correctly argues that circumstantial evidence can be used to prove a discharge. However, the question is whether that circumstantial evidence, which is vigorously challenged by Riverview Cattle, satisfies EPA's burden of proof when direct evidence was available and not pursued." Resp. Reply Br. at 2. Respondents assert that cases cited by Complainant in support of its position that it may use circumstantial evidence to establish the alleged violations in this matter are either distinguishable from the facts in this matter or simply do not support Complainant's position.[57] *See* Resp. Reply Br. at 3, 7-8. Noting that both parties in this matter have cited to *Lowell Vos Feedlot*, *see* Resp. Reply Br. at 8, Respondents reiterate that the facts in this case are distinguishable from the circumstances in *Lowell Vos Feedlot*, where inspectors were not present at a facility during a discharge event, as it asserts inspectors could have obtained direct evidence of a discharge in this proceeding during the 2014 Inspection, *see* Resp. Reply Br. at 2-3.

[57] Notably, Respondents assert that a case cited by Complainant in its Reply Post-Hearing Brief, *Environmental Protection Information Center*, is inapposite, because this matter involved evidence of a discharge collected at a navigable water. Resp. Reply Br. at 6-7 (citing Compl. Reply Br. at 7; *Envtl. Prot. Info. Ctr.*, 460 F. Supp.2d at 819, 824).

Likewise, Respondents note that Complainant cited to *Leed Foundry* in its Reply Post-Hearing Brief, and Respondents suggest this case is distinguishable to the facts at issue in the present matter, as *Leed Foundry* involved runoff directly to a municipal storm sewer, rather than runoff though a field to a tile drainage system, as at issue in the present matter. Resp. Reply Br. at 6-7. Further, Respondents reassert their position that Mr. Urban and Mr. Roberts could have obtained direct evidence from the tile drain outlet during the 2014 Inspection, citing to testimony from Respondents which they suggest rebuts evidence offered by Compliant regarding the reasons inspectors were unable to obtain a sample during the 2014 Inspection. Resp. Reply Br. at 6-7 (citing Resp. I. Br. at 9-12). Additionally, Respondents assert that the argument offered by Complainant that inspectors could not return to the Riverview Facility to obtain a sample the day following the 2014 Inspection due to other scheduled inspection "is not a valid reason for not adequately completing this inspection and [inspectors] simply chose not to make all reasonable efforts to gather critical direct evidence." Resp. Reply Br. at 6-7 (citing Resp. I. Br. at 9-12). Due to the fact that inspectors did not obtain evidence from the tile drain outlet during the 2014 Inspection, Respondents argue that the circumstantial evidence presented by Complainant should not be considered, but otherwise states that

> At the same time, Riverview Cattle recognizes that is a rather extreme position. But at the very least, because the absence of direct evidence in this case is not because the direct evidence wasn't reasonably possible for EPA to obtain, EPA's circumstantial evidence – evidence that is disputed by Riverview Cattle – should be given minimal weight.

Resp. Reply Br. at 8.

With specific regard to Complainant's Modeling Evidence, Respondents reiterate that this evidence is insufficient to satisfy Complainant's burden of proof as this evidence is not accurate or reliable evidence of the alleged violations. *See* Resp. Reply Br. at 5-6, 9-12. In response to Complainant's assertion that Mr. Hentges does not have the qualifications or authority to declare that modeling evidence is inappropriate in CWA enforcement cases, Respondents note that Mr. Hentges' opinion on the reliability of modeling evidence has been accepted by an Administrative Law Judge in a prior proceeding. Resp. Reply Br. at 5-6 (citing *Vos*, 2009 WL 1670391, at *17 (EPA ALJ, June 8, 2009)). Respondents further maintain their criticism of precipitation and soil inputs used by Dr. Wang in Complainant's Modeling Evidence, despite Complainant's arguments in response to this position. With regard to their arguments regarding the precipitation data used by Dr. Wang, Respondents assert that

> The reason for the Riverview Cattle's argument concerning discrepancies in rainfall totals is to point out to this Court that in rural Iowa, the difference of a few miles can affect the magnitude of the rain received resulting in drastically different results in the same area. This is not anecdotal information, it is reality.

Resp. Reply Br. at 9. Given this high variability regarding precipitation in rural Iowa, Respondents conclude that precipitation data employed in Complainant's Modeling Evidence is

not reliable for the Riverview Facility, miles away. *See* Resp. Reply Br. at 9. Likewise, Respondents indicate that the soil inputs used by Dr. Wang in the Curve Number Method modeling do not reflect site conditions, because they do not fully account for the specific infiltration rates of soil at the Riverview Facility. Resp. Reply Br. at 10-11. Addressing this position, Respondents suggest that because the Curve Number Method classifies soil types into four groups associated with infiltration rate ranges for modeling calculations, it does not specifically consider the infiltration rate of each soil in the modeled area, and is insufficiently precise. *See* Resp. Reply Br. at 10. Respondents conclude that "[t]he only way to determine how much water is infiltrating is to measure the infiltration in the soil at the site."[58] Resp. Reply Br. at 10.

Additionally, Respondents dispute that Dr. Wang sufficiently verified Complainant's Modeling Evidence. *See* Resp. Reply Br. at 9-11. Respondents suggest that Dr. Wang's comparison of modeling results to observed conditions during the 2014 and 2016 Inspections for purposes verifying modeling accuracy is not significant, as modeling inputs can be manipulated for desired consistency, and otherwise, the weather associated with the 2014 Inspection was "an anomaly even for Iowa." Resp. Reply Br. at 9-10. Respondents reassert their position that Dr. Wang should have measured actual runoff from the Riverview Facility to verify Complainant's Modeling Evidence, and note that this was not done. Resp. Reply Br. at 11. As a result, Respondents' conclude that models employed in Complainant's Modeling Evidence "may be sufficient to provide a method for determining whether a discharge may occur but to determine if an event occurred for purposes of imposing liability and penalties, the model[s] and the methodology fall far short of the kind of reliability inherently necessary for the EPA to satisfy its burden." Resp. Reply Br. at 11-12.

In addition to Respondents' argument that Complainant's Modeling Evidence is insufficient to satisfy Complainant's burden of proof, Respondents more broadly contend that Complainant has failed to meet its burden of proof to establish the alleged violations in this matter. *See* Resp. Reply Br. at 2-3, 8-9, 12-12. With regard to Complainant's evidence regarding the flow of process wastewater runoff from the Riverview Facility, Respondents reassert their position that Complainant failed to establish that process wastewater runoff from the Central Alley traveled through Pen 1 prior to the construction of the Manure Pit, in consideration of testimony from Respondents and Ms. Heiken's topographical map of the Riverview Facility in CX 55. 3. *See* Resp. Reply Br. at 12-13. Additionally, Respondents argue that their manure scraping and removal practices must be considered with regard to runoff from the Riverview Facility, and Respondents further suggest that such practices were not accounted for in Complainant's Modeling Evidence. Resp. Reply Br. at 13.

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[58] In making this argument, Respondents quote new material outside of the evidence admitted at hearing, from Chapter 10 of the 2004 edition of the NRCS National Engineering Handbook, which they assert is available at: http://www.wcc.nrcs.usda.gov/ftpref/wntsc/H&H/NEHhydrology/chlO.pdf. *See* Resp. Reply Br. at 10-11. In doing so, Respondents note that this source was cited by Dr. Wang in CX 20, an exhibit which Complainant notably filed with its Initial Prehearing Exchange on January 6, 2017, substantially in advance of the hearing in this proceeding. *See* Resp. Reply Br. at 10 (citing CX 20 at 13). Neither Complainant nor Respondents in this matter offered this material as evidence at the hearing, and Respondents have not moved to request that I reopen the hearing to take further evidence, *see* 40 C.F.R. § 22.28. Under these circumstances, it is inappropriate to consider this new material in this proceeding.

Likewise, Respondents argue that Complainant failed to establish that process wastewater from the Riverview Facility in the Swale entered the tile drain inlet. *See* Resp. Reply Br. at 3-4. In making this argument, Respondents state that with regard to the 2014 Inspection, it is undisputed that the Manure Pit at the Riverview Facility overflowed, that overflow from the Manure Pit reached the Swale, and that the inspectors took samples from the Swale. Resp. Reply Br. at 1, 3. However, Respondents argue that Complainant did not establish that water in the Swale entered the tile drain inlet during the 2014 Inspection. *See* Resp. Reply Br. at 3-4. Respondents note that the observations of inspectors regarding the tile drain inlet were not corroborated by sound or video recording, and suggest such observations are inconsistent with testimony presented by Respondents. Resp. Reply Br. at 4. Additionally, Respondents contest that they admitted in their pleadings that water entered the tile drain inlet during the 2014 Inspection. Resp. Reply Br. at 4.

Respondents further assert that Complainant failed to meet its burden of proof in establishing that pollutants entering the tile drain inlet from the Riverview Facility discharged to the East Fork of the Des Moines River. *See* Resp. Reply Br. at 3-4, 8-9. Specifically addressing the conditions during the 2014 Inspection, Respondents assert that "EPA has the burden of proof in this case and EPA has not met that burden to prove that any pollutants that allegedly entered the tile line on June 17, 2014 were discharged to the East Fork of the Des Moines River." Resp. Reply Br. at 9. Respondents note that Respondent Tony Brown unequivocally denied making any admission to Mr. Draper during the April 2018 Site Inspection regarding a discharge at the time of the 2014 Inspection. *See* Resp. Reply Br. at 4 (citing Resp. I. Br. at 12-13). Further, Respondents suggest that such an admission would be very improbable, given Respondents' vigorous defense in this proceeding. Resp. I. Br. at 4. Likewise, Respondents defend evidence from Mr. Hentges regarding flow of water in the tile drainage system and outflow from the tile drainage outlet. *See* Resp. Reply Br. at 8-9. Addressing the movement of water in the tile drainage system, Respondents assert that "water and especially groundwater does not always flow like one might predict, especially in a computer model." Resp. Reply Br. at 8 (citing Resp. I. Br. at 19). Respondents further contend that Mr. Hentges' experience supports his testimony regarding the movement of water in the tile drainage system, arguing that "as a scientific professional who spends considerable time in the field, [Mr. Hentges] has experienced this unpredictability and did not testify that something would happen for sure when the science is not that certain." Resp. Reply Br. at 8. Likewise, Respondents contend that Mr. Hentges adequately supported his opinion that water would not flow from the outlet when submerged, indicating that his testimony made clear that this was premised upon consideration on head pressure in the tile drainage system and in the river. *See* Resp. Reply Br. at 8 (citing Tr. 1267). Additionally, Respondents reiterate their argument that Mr. Hentges' comparison of photographs taken during the 2014 Inspection and the May 2018 Site Visit supports the position that the tile drain outlet was submerged during the 2014 Inspection. *See* Resp. Reply Br. at 8. Citing to Mr. Hentges' testimony, Respondents conclude that it is uncertain whether water would have exited the tile drain outlet on the date of the 2014 Inspection or on any of the other alleged dates of violation. *See* Resp. Reply Br. at 8-9 (citing Tr. 1279-80).

Finally, Respondents reassert their claim that any discharges of pollutants from the Riverview Facility to the East Fork of the Des Moines River during the alleged period of violations would not be in violation of the CWA as de minimis discharges, and contest

Complainant's position that the alleged discharges in this matter would not be permissible under the CWA as de minimis discharges of pollutants. *See* Resp. Reply Br. at 14-15. Respondents maintain their position that *Hawai'i Wildlife Fund* acknowledges a de minimis defense to liability under the CWA. *See* Resp. Reply Br. at 15. Respondents acknowledge caselaw cited by Complainant for the proposition that there is no de minimis defense under the CWA. Resp. Reply Br. at 14 (citing *Int'l. Union*, 740 F. Supp. at 1083). However, Respondents note that the case cited for this proposition contains a citation in a footnote for *Arkansas Poultry Federation v. United States Environmental Protection Agency,* 852 F.2d 324, 329 (8th Cir.1988), which they indicate relates to prohibited discharges under the CWA and they suggest provides further support for a de minimis defense to liability for unauthorized discharges under the CWA. *See* Resp. Reply Br. at 14-15. Respondents acknowledge that "[a] de minimis defense under the Clean Water Act is obviously not close to being settled by the courts," but suggest that *Hawai'i Wildlife Fund* provides a basis for considering this as a defense to liability in this matter. Resp. Reply Br. at 15.

b. Discussion

To establish the alleged violations of Section 301(a) of the CWA, 33 U.S.C. § 1311(a), Complainant must establish that (1) Respondents are each a person (2) who discharged a pollutant (3) into navigable waters (4) from a point source (5) without a permit authorizing such discharges. *See* 33 U.S.C. § 1311(a). As previously discussed, Complainant has the burdens of presentation and persuasion in this matter, 40 C.F.R. § 22.24(a), and must establish each of these elements by a preponderance of the evidence, 40 C.F.R. § 22.24(b). Complainant has satisfied its burden of proof where it has established that each contested element of the alleged violations is more likely than not to be true. *See e.g.*, *Euclid of Va., Inc.*, 13 E.A.D. at 626; *Ocean State Asbestos Removal, Inc.*, 7 E.A.D. at 530; *Echevarria*, 5 E.A.D. at 638.

In this matter, several issues are uncontested. Respondents have admitted that they are each a person within the meaning of this term in the CWA. Compl. ¶ 4; Answer ¶ 4. Likewise, it is undisputed that the East Fork of the Des Moines River is a water of the United States, and therefore a navigable water pursuant to 33 U.S.C. § 1362(7). *See* JX 1 at ¶ 2; Compl. ¶ 31; Answer ¶ 32. Additionally, it is uncontested that Respondents did not have a NPDES permit authorizing pollutant discharges from the Riverview Facility during the period of alleged violations. *See* Compl. ¶ 37; Answer ¶ 37. Accordingly, the remaining elements in dispute with regard to the alleged violations are (1) whether Respondents discharged a pollutant from the Riverview Facility to the East Fork of the Des Moines River during the period from May 10, 2011 through June 18, 2014, and (2) whether the Riverview Facility was a point source pursuant to the CWA during the period from May 10, 2011 through June 18, 2014. Accordingly, these remaining elements are addressed in detail below, as well as Respondents' argument that any unauthorized discharges established are excused by an exception or defense to liability for de minimis discharges of pollutants.

Before addressing the remaining disputed elements of the alleged violations and Respondents' asserted exception or defense to liability, I first address certain evidentiary arguments raised by Respondents in this proceeding. As discussed, Respondents argue that the circumstantial evidence offered by Complainant in this matter should be afforded little or no

weight, due to the fact that inspectors did not obtain direct evidence of a discharge from the tile drain outlet during the 2014 Inspection. *See* Resp. I. Br. at 1-2, 4, 9-12; Resp. Reply Br. at 2-8. Respondents further contest reliance upon Mr. Draper's testimony regarding an admission of a discharge during the 2014 Inspection by Respondent Tony Brown during the April 2018 Site Visit. *See* Resp. I. Br. at 12-14; Resp. Reply Br. at 4. Further, as previously noted, Respondents assert the general argument that use of modeling evidence is inherently problematic in enforcement proceedings and may not be sufficient to satisfy the relevant standard of proof. *See* Resp. I. Br. at 20-21, 23. Finally, I address Respondents' argument that Complainant's Modeling Evidence is insufficient to meet Complainant's burden of proof in this proceeding, as it is not accurate or reliable evidence. *See* Resp. I. Br. at 22-25, 28-30; Resp. Reply Br. at 5-6, 9-12. Each of these evidentiary issues is examined below.

i. Evidentiary Issues

A. Respondents' Arguments Regarding Circumstantial Evidence

It is well established that circumstantial evidence may be relied upon as evidence of a material fact. *See BWX Techs.*, 9 E.A.D. at 78 ("[The respondent's] exclusive reliance upon circumstantial evidence did not, by itself, render its case infirm, for circumstantial evidence can be effectively used to state a proposition of material fact in the absence of direct evidence."). Specifically, within the context of the CWA, discharges of pollutants may be inferred from circumstantial evidence. *See, e.g.*, *Concerned Area Residents for the Env't*, 34 F.3d at 120 (finding that the fact finder may infer point source discharges from circumstantial evidence); *Lowell Vos Feedlot*, 15 E.A.D. at 314 (holding that the government, in CWA actions, can "use any kind of evidence, direct or inferential, to attempt to establish that an unlawful discharge occurred"). As discussed in detail above, Respondents have argued that in this matter circumstantial evidence offered by Complainant should be afforded little or no weight, due to the fact that inspectors did not obtain direct evidence of a discharge from the outlet of the tile drainage system during the 2014 Inspection. *See* Resp. I. Br. at 1-2, 4, 9-12; Resp. Reply Br. at 2-8. In response, as noted above, Complainant contends that this argument is not supported by law and is inconsistent with the applicable evidentiary standard for this proceeding. *See* Compl. Reply Br. at 4-8. I agree with Complainant, as explained below.

As previously noted, both parties in this matter have cited to the EAB's decision in *Lowell Vos Feedlot* in support of their arguments pertaining to the use and weight assigned circumstantial evidence in this matter. Specifically, Respondents refer to a citation in *Lowell Vos Feedlot* quoting *BWX Technologies, Inc.*, 9 E.A.D. at 78, in which the EAB states that that "exclusive reliance on circumstantial evidence does not necessarily render a case infirm, because 'circumstantial evidence can be effectively used to state a proposition of material fact in the absence of direct evidence.'" Resp. I. Br. at 4; Resp. Reply Br. at 2 (quoting *Lowell Vos Feedlot*, 15 E.A.D. at 322); *see also Lowell Vos Feedlot*, 15 E.A.D. at 322 (quoting *BWX Techs.*, 9 E.A.D. at 78). Respondents then assert that this citation supports the proposition that EPA may only rely upon circumstantial evidence to establish discharges of pollutants in violation of the CWA in circumstances where EPA had no opportunity to collect direct evidence of a discharge in violation of the CWA, noting that in *Lowell Vos Feedlot*, EPA inspectors were not present during a discharge event to obtain such evidence. *See* Resp. I. Br. at 4; Resp. Reply Br. at 2-3 (quoting

Lowell Vos Feedlot, 15 E.A.D. at 324). However, there is no support in *Lowell Vos Feedlot* for such a position. On the contrary, the EAB in *Lowell Vos Feedlot* did not identify any such limitation on the use of circumstantial evidence in CWA proceedings, and conversely stated that the government, in CWA actions, can "use any kind of evidence, direct or inferential, to attempt to establish that an unlawful discharge occurred." *Lowell Vos Feedlot*, 15 E.A.D. at 314. Additionally, Respondents have not otherwise provided legal support for such a position, and this type of evidentiary limitation is otherwise inconsistent with provisions in the Rules of Practice setting forth the admissibility of evidence and the burden and standard of proof. 40 C.F.R. §§ 22.22, 22.24. Accordingly, I decline to assign little or no weight to Complainant's circumstantial evidence on such a basis, and such evidence is evaluated further below. Having determined that Complainant may use such circumstantial evidence to establish the alleged violations, I do not need to further explore whether the numerous reasons offered by Mr. Urban and Mr. Roberts in support of their inability to collect a sample from the tile drain outlet, *see* Tr. 136-39, 141, 191, 193-94, 212, 263, are objectively supported.

B. Testimony Regarding Admission from Respondent Tony Brown

Additionally, as noted, Respondents contest reliance upon Mr. Draper's testimony regarding an admission of a discharge during the 2014 Inspection by Respondent Tony Brown during the April 2018 Site Visit. *See* Resp. I. Br. at 12-14; Resp. Reply Br. at 4. After considering the testimony from Mr. Draper, Respondent Tony Brown, and Ms. Benson regarding this alleged admission, I find such evidence lacks probative value. Specifically, the ambiguity of what was stated and how the term "discharge" may have been used in the referenced conversation overwhelmingly diminished the already limited probative value of this offered evidence. Accordingly, consistent with Respondents' arguments, I did not consider this evidence in my determination regarding liability.

C. Respondents' General Arguments Regarding Modeling Evidence

Contrary to Respondents' arguments, I do not find that modeling evidence, such as Complainant's Modeling Evidence, is inherently of little probative value in CWA enforcement proceedings. Although Respondents did not challenge the admissibility of Complainant's Modeling Evidence, their argument that use of modeling evidence is inherently problematic in enforcement proceedings and may not be sufficient to satisfy the relevant standard of proof, appears premised upon the position that such evidence is inherently of little probative value. *See* Resp. I. Br. at 22-25. As acknowledged by Respondents, *see* Resp. I. Br. at 21, hydrologic modeling evidence has been used as circumstantial evidence establishing discharges of pollutants in other cases brought under the CWA. *See*, *e.g.*, *San Pedro Forklift, Inc.*, 15 E.A.D. at 874-75; *Leed Foundry, Inc.*, 2007 WL 2192945, at *20. While Respondents have questioned whether modeling evidence alone can satisfy Complainant's burden of proof, *see* Resp. I. Br. at 21, Complainant in this matter is not relying solely upon modeling evidence to establish the alleged discharges, but instead using modeling evidence in conjunction with other evidence to establish the alleged discharges, including the observations of inspectors during inspections of the Riverview Facility. *See e.g.*, CX 1; CX 1.5; CX 8; CX 8.6 (inspection reports and photographs from the 2014 and 2016 Inspections). Mr. Hentges' broad opinion that modeling evidence is insufficient to establish violations of law in enforcement proceedings, cited by Respondents, *see*

Resp. I. Br. at 21-23 (citing Tr. 1170-71, 1232), is not persuasive, as this opinion is not premised upon the standard of proof at issue in this matter and involves a legal conclusion. Furthermore, Respondents' suggestion that modeling evidence, such as Complainant's Modeling Evidence, consists of prediction, but does not reflect evidence of actual discharge events, is not consistent with the use of modeling evidence in this proceeding. *See* Resp. I. Br. at 21, 23. In this matter, Complainant's Modeling Evidence has been offered by Complainant in support of actual discharges in violation of the CWA, and this matter does not involve allegations of prospective discharge events. As a result, I have evaluated Complainant's Modeling Evidence in determining liability, as discussed in greater detail below.

D. Respondents' Arguments Regarding Complainant's Modeling Evidence

Turning to Respondents' more specific position that Complainant's Modeling Evidence is insufficient to satisfy Complainant's burden of proof because this evidence is not accurate or reliable, *see* Resp. I. Br. at 22-25, 28-30; Resp. Reply Br. at 5-6, 9-12, I do not find this contention to be supported upon thorough review of the record. In making this determination, I considered Respondents' arguments challenging modeling inputs and calculations used by Dr. Wang regarding runoff flow from the Central Alley to Pen 1, precipitation, and soil, and their contention that Dr. Wang did not sufficiently verify such modeling with data collection from the Riverview Facility. *See* Resp. I. Br. at 22-25, 28-30; Resp. Reply Br. at 5-6, 9-12. Additionally, I carefully considered the evidence supplied by Respondents in support of such arguments, including Mr. Hentges' analysis of Complainant's Modeling Evidence. However, contrary to Respondents' arguments and Mr. Hentges' analysis, I find that Complainant's Modeling Evidence is reliable, accurately reflects the conditions at the Riverview Facility during the period the period from May 10, 2011 to June 18, 2014, and constitutes credible, probative evidence in this matter.

The reliability and accuracy of modeling evidence, such as Complainant's Modeling Evidence, is dependent upon the methodology utilized, the selection of input data to accurately reflect site conditions, and the validation measures employed. In the present case, Complainant's Modeling Evidence utilized reliable methodology, calibrated modeling inputs to accurately reflect site conditions, and employed sufficient validation measures to verify modeling results. Accordingly, I find that Complainant's Modeling evidence is credible, probative evidence, which may be used by Complainant to establish the alleged violations by a preponderance of the evidence.

The record reflects that Complainant's Modeling Evidence employed sound methodology. As previously noted, Dr. Wang employed both the HEC-RAS Model developed by the United States Army Corps of Engineers and the Curve Number Method developed by NRCS within Complainant's Modeling Evidence. *See* CX 20 at 4-5, 7-9; Tr. 530-31, 561, 572-73. Notably, Mr. Hentges, while critical of use of modeling evidence in enforcement proceedings, acknowledged in his testimony that he has used the HEC-RAS Model and the Curve Number Method, and further indicated that these methodologies are often used in the field of hydrology. *See* Tr. 1168-70. The only specific criticism of the methodology employed in Complainant's Modeling Evidence from Respondents and Mr. Hentges appears to relate to how the Curve Number Method classifies soil types into four groups for purposes of assigning a curve

number in the modeling. *See* Resp. Reply Br. at 10; Tr. 1174-75, 1225-29; *see also* Tr. at 562-63, 593-94 (testimony from Dr. Wang regarding this grouping of soil types in the Curve Number Method). Specifically, Respondents argue that because of such grouping, the Curve Number Method does not specifically consider the infiltration rate of each soil involved in a modeled area, and suggest that as a result this methodology is insufficiently precise. *See* Resp. Reply Br. at 10. Respondents' argument regarding this aspect of the Curve Number Method appears related to testimony from Mr. Hentges in which he asserted that while Dr. Wang reported that Canisteo clay loam is associated with the NRCS soil group of C/D with a group infiltration rate range of 0.0 to 0.15 inches per hour, he found a higher infiltration rate range of 0.15 to 2 inches per hour listed for this particular soil on a NRCS affiliated website. Tr. 1174-75, 1225-29; *see also* CX 20 at 15 (Table 15). As previously noted, however, Mr. Hentges notably did not supply the information he referenced in his testimony, and he conceded that a NRCS soil group classification of C or D is "probably right" for this soil within the Curve Number Method, Tr. 1227. Additionally, Mr. Hentges' testimony regarding this criticism of the Curve Number Method was further undercut by his statements regarding his familiarity with this method, specifically his testimony that he reviews material from the NRCS when applying the Curve Number Method for modeling, because, as he stated, "[i]t's not like I do it every day." Tr. 1219. Further, Respondents did not provide any other evidence supportive of a finding that the methodology of the Curve Number Method is insufficiently precise because of the way in which it classifies different soil types into four groups. Such a position is further inconsistent with the evidence of record reflecting that the Curve Number Method is a widely used methodology for modeling runoff in the field of hydrology and is regarded as reliable. *See* Tr. 565-68; CX 20 at 8-9; CX 20.1 at 1. Notably, such evidence appears to be consistent with Respondents' concession in their Reply Post-Hearing Brief, that "[a]ll parties agreed that the NRCS curve number method is a widely used and efficient method for determining the approximate amount of runoff from a rainfall even[t] in a particular area." Resp. Reply Br. at 10. Accordingly, I do not find the criticism from Respondents regarding the methodology of the Curve Number Method to be sufficiently supported.

In addition to employing sound methodology, the record reflects that Complainant's Modeling Evidence was calibrated to the conditions at the Riverview Facility during the period from May 10, 2011 to June 18, 2014, and that the data inputs and calculations used in such evidence are sufficient to accurately reflect the site conditions at the Riverview Facility during this period, contrary to arguments from Respondents and Mr. Hentges' analysis of such evidence. Upon review of Complainant's Modeling Evidence, it is clear that such evidence was calibrated to the specific conditions at the Riverview Facility during the relevant period by using site-specific data inputs and calculations. Specifically, as extensively discussed above, Dr. Wang utilized data inputs premised upon the actual conditions at the Riverview Facility in the HEC-RAS modeling and the Curve Number Method modeling. *See supra* at 19-23. Further, Dr. Wang performed site-specific calculations regarding the storage capacity of the process wastewater holding areas, *see supra* at 24-26; the storage capacity of the Swale and the flow rate of runoff from the Swale into the tile drain inlet, *see supra* at 26; evaporation and soil infiltration of runoff, *see supra* at 27-28; flow analysis for the tile drainage system, *see supra* at 31-32; and the fate and transport of E. coli bacteria in runoff from the Swale to the tile drain outlet, *see supra* at 33. Although Mr. Hentges asserted in his report in RX 2, and his testimony, that Dr. Wang did not calibrate Complainant's Modeling Evidence to be site-specific to the Riverview

Facility, *see* RX 2 at 2; Tr. 1173, 1213, this assertion is very clearly contradicted by the evidence of record regarding Complainant's Modeling Evidence, as previously identified. Additionally, it is notable that Mr. Hentges did not identify which elements of Dr. Wang's modeling that he determined were not calibrated to the Riverview Facility, *see* RX 2 at 1-2, 6; Tr. 1173, 1213, and he further acknowledged in his testimony that he did not review the materials cited by Dr. Wang in CX 20 and relied upon in Complainant's Modeling Evidence, *see* Tr. 1213-14, indicating that his familiarity with the information used by Dr. Wang in Complainant's Modeling Evidence is limited.

The record further reflects that the site-specific data inputs and calculations utilized by Dr. Wang in Complainant's Modeling Evidence are sufficient to accurately reflect the site conditions at the Riverview Facility during the period from May 10, 2011 to June 18, 2014. Respondents have noted that Complainant's Modeling Evidence is dependent upon modeling inputs, and have suggested that such reliance makes such evidence variable in nature and subject to manipulation. *See* Resp. I. Br. at 23-25; Resp. Reply Br. at 9-10. In support of this, Respondents have cited to testimony from Dr. Wang in which he discusses how Complainant's Modeling Evidence considered if there was a discharge from the Riverview Facility to the East Fork of the Des Moines River on the date of the 2014 Inspection, which Respondents argue evidences inconsistency that highlights the variable nature of such modeling evidence. *See* Resp. I. Br. at 23-25 (citing Tr. 664-66, 668-69, 689-90). However, the testimony referenced by Respondents from Dr. Wang was offered to explain how different conditions from the 2014 Inspection were considered in Complainant's Modeling Evidence, and how the results of Complainant's Modeling Evidence would change if different conditions were assumed. *See* Tr. 664-69, 689-91. Such testimony does not indicate that this evidence was manipulated to achieve a specific outcome. Notably, instead of manipulating inputs and calculations to achieve results consistent with discharges from the Riverview Facility to the East Fork of the Des Moines River, it is evident that Dr. Wang regularly applied inputs and calculations which were less likely to result in modeling discharges, in Respondents' favor, consistent with his reported conservative modeling approach. *See* Tr. 560, 568-69, 571-72, 618. Among such conservative calculations, as discussed above, Dr. Wang limited the modeling of discharges from the Riverview Facility in Complainant's Modeling Evidence to the months of April through October during the period from 2011 through 2014, Tr. 560-61; he adjusted several of the runoff curve numbers applied in the Curve Number Method modeling downward from the NRCS recommended numbers for the applicable conditions, s*ee* Tr. 601-08; CX 20.1 at 1-2; he calculated the storage capacity of the Manure Pit based upon a larger depth than that observed by inspectors, *see* Tr. 571, 608-09; CX 20 at 5, 11; CX 20.1 at 2; CX 20.2 at 4; he applied a lower rate of occlusion for the holes in the tile drain intake inlet pipe, increasing the flow speed and reducing the number of days of discharge, *see* CX 20 at 10-11; CX 20.2 at 66, 88; Tr. 560; and he applied a higher evaporation rate for runoff impounded in the Manure Pit and Swale than those reflected in localized data; *see* CX 20.2 at 65; Tr. 560, 571, 618-20. Further, as discussed in greater depth below, the record reflects that the modeling inputs and calculations employed in Complainant's Modeling Evidence were selected to reflect the actual conditions at the Riverview Facility, and in fact, did sufficiently reflect such conditions to render Complainant's Modeling Evidence reliable and probative evidence. As previously discussed, Respondents' challenge modeling inputs and calculations used by Dr. Wang regarding runoff flow from the Central Alley to Pen 1, precipitation, and soil. *See* Resp. I. Br. at 22-25, 28-30; Resp. Reply Br. at 9-11. However, I do

not find such challenges undermine the accuracy of the calibration of the inputs and calculations in Complainant's Modeling Evidence to the Riverview Facility.

With regard to the arguments raised by both parties regarding Dr. Wang's analysis of runoff flow from the Central Alley through the gate area of Pen 1 to the Swale, as reflected in CX 20.3, such arguments do not appear to take into account the way in which Dr. Wang considered certain topographical features of the Riverview Facility, including Pen 1, through use of LiDAR in Complainant's Modeling Evidence.[59] *See* CX 20 at 8; CX 20.3; Tr. 577-79, 582; *see also* CX 20 at 28 (Figure 13(a), depicting LiDAR imaging of the modeled watershed area encompassing the Riverview Facility). Specifically, Dr. Wang utilized LiDAR data of the Riverview Facility obtained from the University of Northern Iowa for his HEC-RAS Model calculations, *see* CX 20 at 8, Tr. 577-79, 582, and further used such LiDAR data in his calculations regarding the capacity of the Central Alley, *see* CX 20.3. As noted by Respondents, *see* Resp. I. Br. at 29-30, testimony from Respondents reflects that Pen 1 was constructed with a slope of approximately six to eight inches of decreasing elevation to the south, away from its gate area, s*ee* Tr. 819-21; 998-99; 1028-29. However, Dr. Wang accounted for this and other topographical features of the Riverview Facility by considering LiDAR data, and the mere presence of this slope in the concrete of Pen 1 does not preclude the flow of wastewater through the gate area. Notably, testimony from Respondents supports Dr. Wang's analysis that process wastewater from the Central Alley flowed through Pen 1 prior to construction of the Manure Pit, as such testimony establishes that process wastewater would flow between the Pen 1 and the Central Alley through a hole located in the eastern wall of Pen 1, adjoining the north end of the Central Alley. *See* Tr. 819-21; 998-99; 1028-29.

Further, the record reflects that, consistent with Dr. Wang's use of LiDAR in Complainant's Modeling Evidence, LiDAR data is commonly relied upon by experts in the field of hydrology for purposes of evaluating surface elevation and flow. *See* Tr. 579, 582. Although Mr. Hentges asserted that it is his understanding that LiDAR has a margin of error of approximately two feet, and therefore, opined that Dr. Wang should have surveyed the area of the Riverview Facility, *see* Tr. 1221-22, there is no evidence in the record reflecting that the LiDAR data employed in Complainant's Modeling Evidence is inaccurate to the conditions at the Riverview Facility. Further, Mr. Hentges' position that Dr. Wang should have employed suvey data instead of LiDAR data in Complainant's Modeling Evidence is undermined by his admission that LiDAR data is routinely relied upon by engineers, and that he routinely uses such data. *See* Tr. 1222-23. Finally, with regard to comparing Dr. Wang's analysis of runoff flow from the Central Alley through the gate area of Pen 1 prior to the construction of the Manure Pit in CX 20.3, to the topographical map prepared by Ms. Heikens in CX 55.3 at 1, I do not find

[59] As reflected in the discussion of Complainant's Modeling Evidence above, use of LiDAR was only one method in which Dr. Wang considered topographical features of the Riverview Facility. Notably, Dr. Wang reported that the LiDAR data he employed from the University of Northern Iowa was obtained in November 2009. *See* Tr. 578-79. As a result, he noted that such data did not account for topographical features developed at the Riverview Facility after this date, such as the Manure Pit, which had to be accounted for through other data as described above. *See* CX 20 at 8; *see also* CX 20 at 5, 11; CX 20.1 at 2; CX 20.2 at 1, 4 (discussing Manure Pit development in 2011 and describing how this was considered in Dr. Wang's calculations). However, as the record reflects that Pen 1 was constructed prior to the collection of the LiDAR data, *see* Tr. 795-98, such data would account for the topographical features of this area.

such comparisons apt, as Ms. Heikens' map appears to depict conditions at the Riverview Facility following the construction of the Manure Pit, and was based upon ground points she obtained in her work with Respondents following the construction of the Manure Pit.[60] *See* CX 55.3 at 1; Tr. 1110-11; *See also* Tr. 1080 (testimony from Ms. Heikens regarding the timing of her work with Respondents). As a result, contrary to Respondents' arguments, I do not find that Dr. Wang's analysis of runoff flow from the Central Alley through the gate area of Pen 1 is faulty, and otherwise find that Complainant's Modeling Evidence sufficiently accounted for the topographical features of the Riverview Facility for such evidence to accurately reflect site conditions.

Likewise, I find the precipitation data employed in Complainant's Modeling Evidence sufficiently reliable and accurate to reflect conditions at the Riverview Facility, despite Respondents' arguments challenging the use of such data. As previously discussed, Dr. Wang utilized hourly precipitation data from a NLDAS radar rainfall site maintained by the National Aeronautics and Space Administration in Swea City, Iowa for the HEC-RAS modeling, CX 20 at 6-8; Tr. 582-83, 587; *see also* CX 20 at 26 (Figure 10(a), showing such radar precipitation data from 2000 to 2015), and he used daily precipitation data from a rain gauge station operated by the NCDC in Swea City, Iowa for the Curve Number Method modeling, *see* CX 20 at 6; CX 20.1 at 2; Tr. 584-86, 646-47, 661-62; *see also* CX 20.2 at 5-39 (complete data from this rain gauge station used by Dr. Wang). Notably, both precipitation data collection sites were in a close proximity to the Riverview Facility, with the NLDAS radar rainfall site located 4.5 miles southeast of the Riverview Facility, and the NCDC rain gauge station located approximately five miles from the Riverview Facility. *See* CX 20 at 6-7; CX 20.2 at 5; Tr. 584. Dr. Wang explained in his testimony that both precipitation data sets were selected with consideration of the proximity of the collection stations to the Riverview Facility to account for the spatial variability of precipitation, *see* Tr. 584-87, 646-47, 661-62, and he further observed that the daily precipitation rates generally corresponded across data sets (with hourly data converted to daily data for purposes of comparison), *see* CX 20 at 7. Contrary to Respondents and Mr. Hentges' assertions, *see* Resp. I. Br. at 22; Tr. 1179-80, 1220-21, I do not find that minor variation between the precipitation data sets for the relevant period renders such data unreliable. *See* CX 20 at 26 (Figure 10(a)); CX 20.2 at 5-39 (NLDAS and NCDC precipitation data); *see also* CX 20 at 7, 27 (Figure 11) (discussing comparison between data sets and comparing daily precipitation in 2014 as reflected from NLDAS and NCDC precipitation data). Conversely, as Complainant suggests, *see* Compl. Reply Br. at 17, the fact that Complainant's Modeling Evidence employed two reliable data sets for precipitation from two different sites within a close proximity to the Riverview Facility, bolsters, rather than undermines, the reliability of such evidence.

Additionally, I am not persuaded by Respondents' argument that precipitation in rural Iowa has such high variability that precipitation data collected from the NLDAS and NCDC data collection sites in Swea City, within a close proximity of the Riverview Facility, would not accurately represent the Riverview Facility. *See* Resp. I. Br. at 6-7; Resp. Reply Br. at 9 (arguments from Respondents asserting such variability). Notably, Dr. Wang indicated in his testimony that use of data collected from the Swea City sites is sufficient to account for the

[60] Additionally, as limited information was obtained regarding the meaning of the arrows on Ms. Heikens' map in CX 55.3 at 1, it is difficult to determine with accuracy and specificity the meaning of such markings.

spatial variability of precipitation. *See* Tr. 661-62. Further, the only evidence offered by Respondents in support of their position that the area in which the Riverview Facility is located is associated with high precipitation variability is anecdotal testimony from Respondent Tony Brown recalling an episode of rainfall variability between the Riverview Facility and Swea City. *See* Tr. 838- 40. In the absence of more compelling evidence indicative of high precipitation variability, I do not find Respondents' argument persuasive, particularly given the close proximity of the precipitation data collection sites in Swea City to the Riverview Facility, and the aforementioned testimony from Dr. Wang regarding such spatial variability. As a result, I find that the precipitation data employed in Complainant's Modeling Evidence sufficiently reliable and accurate to reflect conditions at the Riverview Facility.

Turning to soil inputs utilized in Complainant's Modeling Evidence, the record reflects that such inputs are sufficiently reliable and accurate to reflect conditions at the Riverview Facility, even in the absence of core sampling. As previously noted, Respondents and Mr. Hentges argue that Dr. Wang should have collected core samples from the Riverview Facility for purposes of considering specific soil attributes in Complainant's Modeling Evidence. *See* Resp. I. Br. at 22; Tr. 1175-76, 1224-25. However, Respondents provided no evidence to support that the information utilized by Dr. Wang from Survey Geographic Database of the NRCS for the relevant watershed area for the Riverview Facility, *see* CX 20 a 7; CX 20.1 at 1; CX 20. 2 at 2; Tr. 595-96, was erroneous or inadequate. In contrast, Dr. Wang expressed confidence in the reliability of such information. *See* Tr. 652. Further, both Dr. Wang and Mr. Hentges identified that such information is specific to the Riverview Facility site. *See* Tr. 594, 598-99, 1173. As a result, the record reflects that the soil inputs used by Dr. Wang in Complainant's Modeling Evidence are sufficiently reliable and accurate to reflect conditions at the Riverview Facility.

Finally, the record reflects that Dr. Wang employed sufficient validation measures to Complainant's Modeling Evidence to ensure the modeling results accurately reflect conditions at the Riverview Facility. As previously discussed, Dr. Wang employed several different validation measures to verify the results of Complainant's Modeling Evidence. For purposes of validating the overall runoff ratio for the Riverview Facility determined from the Curve Number Method modeling, Dr. Wang compared this ratio to the runoff ratios determined in several applicable regional studies, and he ascertained that the calculated ratio determined by modeling results for the Riverview Facility is within the range of the ratios identified in these localized studies. *See supra* at 23-24; CX 20 at 9; CX 20.1 at 2, 4; Tr. 620-23. Additionally, for both the HEC-RAS and the Curve Number Method modeling, Dr. Wang compared the modeled results to the conditions at the Riverview Facility observed by inspectors during the 2014 Inspection, and determined that the results were consistent with the observed conditions, including observation of overflow from the Manure Pit and observation of runoff from the Riverview Facility into the Swale. *See supra* at 20-21, 28; CX 20 at 8, 10; CX 20.1 at 3; Tr. 575-76; *see also* CX 20 at 29 (Figure 14, HEC-RAS modeling simulation of the Riverview Facility on June 16, 2014). Likewise, for purposes of further validation of the Curve Number Method modeling, Dr. Wang applied such modeling to the dates of the 2016 Inspection and compared the modeled results to the observations of inspectors during the 2016 Inspection, and he determined that his modeled results for these dates were also consistent with observations of inspectors regarding runoff observed from the Riverview Facility during the 2016 Inspection. *See* Tr. 623. Furthermore, the results of Complainant's Modeling Evidence were notably reviewed by other expert modelers

within EPA for purposes of quality review, and Dr. Wang reported that his work satisfied this review. *See* Tr. 623. Dr. Wang also visited the Riverview Facility during the April 2018 Site Visit to personally evaluate his model inputs and his calibration of modeling in the Complainant's Modeling Evidence to conditions at the Riverview Facility, *see* Tr. 418, 629, 633, 670, and he notably reported that his observations during the April 2018 Site Visit gave him assurance with regard to the accuracy of Complainant's Modeling Evidence, *see* Tr. 633.

Respondents, as discussed above, have suggested that the validation measures taken by Dr. Wang are insufficient to verify Complainant's Modeling Evidence, arguing that testimony from Mr. Hentges supports that Dr. Wang should have collected site rainfall and runoff data from the Riverview Facility for validation purposes. *See* Resp. I. Br. at 22 (citing Tr. 1185-86). As indicated by Respondents, Mr. Hentges asserted his opinion in his testimony that Dr. Wang should have measured runoff from the Riverview Facility and compared his findings to his modeling for verification purposes. *See* Tr. 1186, 1216-17. However, this opinion testimony from Mr. Hentges is problematic and not well supported. In espousing his opinion that Dr. Wang should have measured runoff from the Riverview Facility for validation purposes, Mr. Hentges did not provide an explanation for how Dr. Wang would accomplish such measurement in this matter, particularly in consideration of site changes at the Riverview Facility, such as the intake pipe at the tile drain inlet being sleeved and blocked the day following the 2014 Inspection. *See generally* Tr. 1186, 1216-17 (Mr. Hentges' discussion of such proposed validation); Tr. 855-65, 860, 963 (discussion regarding intake pipe at the tile drain inlet being blocked the day following the 2014 Inspection). Additionally, in his testimony, Mr. Hentges conceded that data was collected from the Riverview Facility during both the 2014 and 2016 Inspections, and he did not clearly articulate a reason why such data would be insufficient for validation purposes. *See* Tr. 1219. Mr. Hentges also acknowledged that he was unaware that Dr. Wang applied his modeling to the dates of the 2016 Inspection, as discussed above, for validation purposes, reflecting that Mr. Hentges was not entirely aware of the validation measures employed by Dr. Wang. *See* Tr. 1244-45. Mr. Hentges' opinion regarding how Dr. Wang should have validated Complainant's Modeling Evidence is further undermined by certain limitations he acknowledged with regard to his modeling experience, including his admission that only a minority of his work involves modeling involving runoff, *see* Tr. 1209, and, more specifically, that he has never modeled runoff from a feedlot, *see* Tr. 1205. Notably, Respondents did not offer other evidence for the record consistent with Mr. Hentges' opinion that Dr. Wang should have measured runoff from the Riverview Facility for purposes of validating Complainant's Modeling Evidence. Accordingly, I do not find Respondents' assertion that Complainant's Modeling Evidence was insufficiently verified to be adequately supported.

Having determined that Complainant's Modeling Evidence utilized reliable methodology, calibrated modeling inputs to accurately reflect site conditions, and employed sufficient validation measures to verify modeling results, and therefore, is credible, probative evidence, which may be used by Complainant to establish the alleged violations by a preponderance of the evidence, I have considered such evidence with regard to the remaining disputed elements of the alleged violations, as discussed below.

ii. Disputed Elements of Violation

As previously identified, two elements of the alleged violations of Section 301(a) of the CWA, 33 U.S.C. § 1311(a), remain in dispute in this matter: (1) whether Respondents discharged a pollutant from the Riverview Facility to the East Fork of the Des Moines River during the period from May 10, 2011 through June 18, 2014, and (2) whether the Riverview Facility was a point source pursuant to the CWA during the period from May 10, 2011 through June 18, 2014. After review of all of the evidence of record, I find that Complainant has established both of these disputed elements by a preponderance of the evidence for the period from May 10, 2011 to June 18, 2014.[61] With regard the first disputed element, I find that Complainant has established that it is more likely than not that Respondents discharged pollutants from the Riverview Facility to the East Fork of the Des Moines River on 41 days during the period from May 10, 2011 to June 18, 2014. Specifically, as discussed in detail below, Complainant has established that it is more likely than not that the Riverview Facility conveyed pollutants through process wastewater runoff to the Swale during the period from May 10, 2011 to June 18, 2014, that such process wastewater runoff containing pollutants entered the tile drain inlet at the Swale on 41 days during this period, and that the tile drainage system conveyed the process wastewater runoff containing pollutants to the East Fork of the Des Moines River on these 41 days during this period. As to the final disputed element, I find that Complainant has established that the Riverview Facility was a point source pursuant to the CWA during the period from May 10, 2011 to June 18, 2014, as a Medium CAFO. As Complainant has established both disputed elements of the alleged violations of Section 301(a) of the CWA, 33 U.S.C. § 1311(a), by a preponderance of the evidence, it has established Respondents' liability for such violations on 41 days from May 10, 2011 to June 18, 2014.

A. Respondents Discharged Pollutants from the Riverview Facility to the East Fork of the Des Moines River on 41 days during the period from May 10, 2011 to June 18, 2014.

As addressed above, the finding that Complainant has established by a preponderance of the evidence that Respondents discharged pollutants from the Riverview Facility into the East Fork of the Des Moines River on 41 days during the period from May 10, 2011 to June 18, 2014,[62] is supported by three underpinnings established in this matter, that the Riverview Facility conveyed pollutants through process wastewater runoff to the Swale during the period from May 10, 2011 to June 18, 2014, that such process wastewater runoff containing pollutants entered the tile drain inlet at the Swale on 41 days during this period, and that the tile drainage system conveyed the process wastewater runoff containing pollutants to the East Fork of the Des Moines River on these 41 days during this period. Accordingly, the evidence supporting each of these underpinnings is discussed in detail below.

[61] As discussed below, this period differs from the period of alleged violations, as it is exclusive, rather than inclusive of the date of June 18, 2011.

[62] As discussed in greater depth below, I define this period as exclusive, rather than inclusive of the date of June 18, 2014.

The Riverview Facility conveyed pollutants through process wastewater runoff to the Swale during the period from May 10, 2011 to June 18, 2014.

Complainant has established by a preponderance of the evidence that the Riverview Facility conveyed pollutants through process wastewater runoff to the Swale during the period from May 10, 2011 to June 18, 2014. The record reflects that during this period, the Riverview Facility conveyed process wastewater runoff containing pollutants in overflow from the process wastewater holding areas of the Riverview Facility, the north end of the Central Alley for the period prior to the construction of the Manure Pit, and the Manure Pit, following such construction. In addition, the record further reflects that in addition to overflow from process wastewater holding areas, the Riverview Facility conveyed process wastewater runoff containing pollutants from other production areas of the Riverview Facility where such runoff was not contained in such a holding area, but rather flowed directly to the Swale, including the Feedstock Storage Area, Northern Alley, and Eastern Alley.

With regard to overflow from the process wastewater holding areas, the record reflects that both the north end of the Central Alley and the Manure Pit contributed process wastewater to the Swale, over the period from May 10, 2011 to June 18, 2014, when such holding areas exceeded their holding capacity. Further, it is apparent that such overflow from these process wastewater holding areas contained pollutants, and therefore, that the process wastewater runoff from such overflow contributed pollutants to the Swale.

As discussed in depth above, Dr. Wang employed HEC-RAS modeling to determine the flow of process wastewater from the Riverview Facility to the Swale, *see* Tr. 572-73, 575; CX 20 at 8, 10, and then applied this information to Curve Number Method modeling to determine the volume of runoff from the Riverview Facility traveling to the Swale, *see* CX 20 at 9-12; CX 20.1 at 1; Tr. 553-54, 575. As acknowledged by Respondents, prior to fall 2011, process wastewater from pens and production areas of the Riverview Facility was maintained in the north end of the Central Alley of the Riverview Facility. *See* Tr. 805-07, 815; 830; 999-1000, 1002-03. Notably, Respondents reported that they used equipment to push process wastewater from the concrete pens into the Central Alley after rainfall. *See* Tr. 807-08, 819, 1002-03, 1029-30. As Respondent Tony Brown acknowledged that the process wastewater maintained in north end of the Central Alley included rainwater runoff from pens and "runny manure," Tr. 805-06, it is apparent that such process wastewater contained pollutants, as defined by CWA in 33 U.S.C. § 1362(6).[63] Upon evaluation of the north end of the Central Alley based on aerial imaging of this area from prior to the construction of the Manure Pit and the LiDAR data, Dr. Wang determined that this holding area would hold approximately 1.5 feet of runoff at its north end wall, and collectively contain a total of 27,713 gallons of runoff. CX 20.3. Further, as previously discussed, Dr. Wang determined that when this capacity was exceeded, the process wastewater runoff held in the Central Alley flowed into Pen 1 and then through the gate area of Pen 1 into the Swale. *See* CX 20.3. Dr. Wang identified numerous days in which the volume of process wastewater in the Central Alley exceeded the 27,713 gallon capacity of the Central

[63] As previously noted, "pollutant" is defined by the CWA to include, among other meanings, " . . . solid waste, . . .biological materials, . . . and industrial, municipal, and agricultural waste discharged into water." 33 U.S.C. § 1362(6).

Alley, and contributed overflow of process wastewater runoff into the Swale. *See* CX 20.2 at 67-70; 89-92. Specifically, for the period from May 10, 2011 through August 2011, prior to the construction of the Manure Pit,[64] Dr. Wang determined 34 days in which process wastewater exceeded the capacity of the Central Alley and excess process wastewater flowed to the Swale. *See* CX 20.2 at 67-70; 89-92. Accordingly, the evidence presented by Complainant establishes that process wastewater overflow containing pollutants conveyed from the north end of the Central Alley to the Swale from May 10, 2011 through August 2011, prior to the construction of the Manure Pit.

Respondents contest both that process wastewater in the Central Alley flowed to the Swale through the gate area of Pen 1, and that the process wastewater held in the north end of the Central Alley exceeded the capacity of this holding area. *See* Resp. I. Br. at 23, 28-30, 33; Resp. Reply Br. at 12-13; s*ee also* Tr. 1000 (testimony from Respondent Josh Brown disputing runoff overflow from the Central Alley). However, the evidence offered in support of their positions is not compelling. With regard to the flow of overflow runoff from the Central Alley through the gate area of Pen 1 and into the Swale, Respondents argue that this is inconsistent with their testimony regarding the slope of Pen 1. *See* Resp. I. Br. at 29-30; *see also* Tr. 819-21; 998-99; 1028-29 (testimony from Respondents regarding the slope in Pen 1). However, as previously discussed, Dr. Wang accounted for this topographical feature in Complainant's Modeling Evidence though his use of LiDAR data for the Riverview Facility, *see* CX 20 at 8; CX 20.3; Tr. 577-79, 582, and the mere presence of this slope in Pen 1 does not preclude flow of wastewater through the gate area, or otherwise contradict Dr. Wang's analysis of the flow of process wastewater from the Central Alley through Pen 1, *see* CX 20.3. On the contrary, testimony from Respondent Josh Brown regarding the flow of process wastewater between the Central Alley and Pen 1 appears consistent this Dr. Wang's analysis. *See* Tr. 1027-29; CX 20.3. Notably, Respondent Josh Brown reported that liquid from the Central Alley would back up into Pen 1 in the absence of manure blocking the hole in the wall between the Central Alley and Pen 1. *See* Tr. 1027-30. Although the portion of this testimony regarding the practice of using manure to block this flow pathway between the Central Alley and Pen 1 is not supported elsewhere in the record, this testimony appears to acknowledge the flow of process wastewater from the Central Alley to Pen 1. Respondent Josh Brown also testified that he did not observe process wastewater overflow from the Central Alley prior to the construction of the Manure Pit at the Riverview Facility. *See* Tr. 1000. However, this testimony is inconsistent with the volume of process wastewater runoff directed to the Central Alley prior to the construction of the Manure Pit during this period and the limited capacity of this wastewater holding area. *See* CX 20.2 at 67-70; 89-92; CX 20.3. Furthermore, the record does not reflect that the volume of process wastewater in the Central Alley was meaningfully reduced by pumping or otherwise removing the process wastewater impounded in this area during this period. Although Respondents' reported in their testimony that liquid material in the north end of the Central Alley would be mixed in with solid manure for manure removal, *see* Tr. 806, 815, 1000, Stephen Madden testified that he removes predominately solid manure which can be loaded into a payloader and then distributed in a

[64] As indicated above, the specific date upon which the Manure Pit was installed in or around September 2011 is not certain. *See* Tr. 833. However, as Dr. Wang did not calculate any runoff exceeding the capacity of the Swale during the period of August through October 2011, the uncertainty of this date did not impact his calculation of days upon which the process wastewater runoff in the Swale entered the tile drain inlet. *See* CX 20.2 at 92-93 (calculations from Dr. Wang for field grade conditions at the Swale during this period).

spreader or dump truck during the manure removal services he provides with his brother at the Riverview Facility, inconsistent with substantial removal of process wastewater, *see* Tr. 703-04. Accordingly, I do not find that Respondents rebutted the evidence presented by Complainant demonstrating that process wastewater overflow containing pollutants conveyed from the north end of the Central Alley to the Swale from May 10, 2011 through August 2011, prior to the construction of the Manure Pit.

Additionally, the record reflects that process wastewater runoff continued to overflow from the Riverview Facility once the Manure Pit was constructed as the wastewater holding area in or around September 2011, on occasions when the capacity of the Manure Pit was exceeded. As previously discussed, Dr. Wang determined from his modeling calculations that approximately 95 percent of the runoff from the Riverview Facility was directed to the Manure Pit once it was constructed. *See* CX 20 at 4-5, 8, 11; Tr. 553-56, 652-55; *see also* CX 20 at 19 (Figure 1, depicting an aerial photograph of the Riverview Facility after construction of the Manure Pit marked to identify runoff flow pathways). For purposes of calculating the capacity of the Manure Pit from its construction to June 18, 2014, Dr. Wang completed detailed calculations as described extensively above. Taking into account the concrete ramp, concrete supports, and a concrete apron in the interior of the Manure Pit, as well as the presence of sediment in the Manure Pit, Dr. Wang estimated that the overall actual capacity of the Manure Pit was 322,593 gallons. *See* Tr. 608-09; CX 20 at 11; CX 20.1 at 2; CX 20.2 at 4. In order to calculate the daily capacity of the Manure Pit during the relevant period, Dr. Wang further accounted for Respondents' reported removal of material from the Manure Pit in calculating the Manure Pit capacity, considering both Respondents' reported schedule for removing material from the Manure Pit and the specific removal practices employed by Respondents, as reflected in photographs regarding Manure Pit material removal process. *See* CX 20 at 4, 11; CX 20.1 at 2; CX 20.2 at 1; Tr. 662; *see also* CX 2 at 8 (photograph of Manure Pit being serviced with agitation equipment, submitted by Respondents). Based upon such considerations, Dr. Wang estimated that 75 percent of the capacity of the Manure Pit was available after removal of material from the Manure Pit, equal to approximately 6.75 feet of space within the Manure Pit. CX 20 at 11; CX 20.1 at 2. Further, in determining the daily capacity of the Manure Pit, Dr. Wang accounted for evaporation of process wastewater in this holding area, as discussed above, applying an annual evaporation rate of 1.3 meters for the Manure Pit. *See* CX 20.2 at 65. Using these calculations in conjunction with the volume of runoff received by the Manure Pit from Complainant's Modeling Evidence, Dr. Wang identified 20 days in the months of April through October during the period from 2012 through 2014 upon which the capacity of the Manure Pit was exceeded and runoff from the Manure Pit was contributed to the Swale, including the date of the 2014 Inspection, June 17, 2014. *See* CX 20 at 17 (Table 5), 18 (Table 7); CX 20.2 at 41-64. With specific regard to the date of the 2014 Inspection, Dr. Wang determined that the Manure Pit contributed 18,499 gallons of process wastewater to the Swale on June 17, 2014, CX 20.2 at 59, and he asserted that this modeling result is consistent with the inspectors' observations during the 2014 Inspection, *see* CX 20.1 at 3.

I find the evidence presented by Complainant establishing that process wastewater overflow conveyed from the Manure Pit at the Riverview Facility to the Swale during the period from the construction of the Manure Pit to June 18, 2014, and the dates upon which this activity occurred, to be compelling. Notably, Dr. Wang's calculations regarding the areas of the

Riverview Facility contributing runoff to the Manure Pit and the capacity of the Manure Pit, are generally consistent with Ms. Heikens' conclusions from her analysis regarding the Manure Pit at the Riverview Facility. Ms. Heikens calculations notably differed from the more precise methodology of Dr. Wang, as Ms. Heikens presumed the area draining to the Manure Pit was impervious in making her calculations, *see* Tr. 1099-1101; did not consider the presence of the concrete supports, a concrete apron, and the presence of sediment in the Manure Pit, considered by Dr. Wang, *see* CX 53.3 at 2 (Ms. Heikens' calculations); *see also* Tr. 608-09; CX 20 at 11; CX 20.1 at 2; CX 20.2 at 4 (Discussion of Dr. Wang's calculations); and otherwise did not address Respondents' material removal schedule for the Manure Pit, *see* CX 53.3 at 2. However, based upon her less detailed calculations, Ms. Heikens determined that the Manure Pit would not contain the runoff expected to occur as the result of a 25-year, 24-hour precipitation event, which she determined was 5.2 inches, and that due to this inability, Respondents would be unable to obtain an NPDES permit without further modification to Riverview Facility, *see* Tr. 1085-86; CX 55.3 at 2, which is generally consistent with Dr. Wang's calculations demonstrating that the Manure Pit capacity was insufficient to maintain the process wastewater runoff from the Riverview Facility during the period from May 10, 2011 to June 18, 2014.

With regard to his analysis of Dr. Wang's calculations pertaining to the Manure Pit capacity, Mr. Hentges, in his report in RX 2, asserts that in Complainant's Modeling Evidence, Dr. Wang "assumed only one-quarter of the manure storage was available." RX 2 at 2. However, it is unclear how Mr. Hentges arrived at this conclusion, and upon review of Complainant's Modeling Evidence, it is apparent that this statement is inaccurate. Although Respondents did not provide more specific arguments regarding Dr. Wang's calculations of the Manure Pit capacity, I carefully evaluated this evidence, and found it to be well supported, thorough, and reliable. In evaluating Dr. Wang's Manure Pit capacity calculations, it notable that while Dr. Wang calculated that the material in the Manure Pit was removed on a schedule of four times annually, from June through September, *see* Tr. 662; CX 20 at 4, 11; CX 20.1 at 2; CX 20.2 at 1, Respondents during the 2016 Inspection reported removing material from the Manure Pit five to six times annually, *see* CX 8 at 6. However, I find that the frequency of Manure Pit removal used by Dr. Wang both comports with the more limited annual period during which Dr. Wang performed his calculations (April through October), *see* Tr. 560-61, and as well as Respondents' reported practice of removing material from the manure pit for land application each time hay was harvested, *see* CX 8 at 6; CX 20 at 4, 11; Tr. 376. Further, it is notable that any discrepancy with regard to the frequency of which material is removed from the Manure Pit is immaterial to the 41 established discharges from the Swale to the East Fork of the Des Moines River, as discussed further below, as Dr. Wang determined that calculating more frequent removal of material from the Manure Pit did not alter such dates of discharge. *See* Tr. 609-10, 662-63.

In addition to establishing that process wastewater overflow conveyed from the Manure Pit at the Riverview Facility to the Swale during the period from the construction of the Manure Pit to June 18, 2014, the record also demonstrates that the runoff overflow contributed to the Swale from the Manure Pit contained pollutants. Similar to the runoff overflow from the Central Alley, it is also apparent that the runoff overflow contributed to the Swale from the Manure Pit contained pollutants. During the 2014 Inspection, both Mr. Urban and Mr. Roberts observed process wastewater and manure solids overflowing from the Manure Pit through an opening in

the concrete wall near its southeastern corner, and further observed this overflow runoff flowing east into a field area and then traveling south to the Swale. *See* Tr. 97, 99-109, 112-13, 222-23, 267-69; CX 1 at 7; CX 1.5 at 4, 31-33; CX 1.17 at 6; CX 47 at ¶ 4; CX 48 at ¶ 4. Additionally, there is no evidence in the record that would suggest or support a finding that the overflow runoff on the other dates identified by Dr. Wang following the construction of the Manure Pit would not contain pollutants, as observed by Mr. Urban and Mr. Roberts during the 2014 Inspection. As a result, the evidence presented by Complainant demonstrates that process wastewater overflow containing pollutants conveyed from the Manure Pit to the Swale during the period from the construction of the Manure Pit to June 18, 2014.

In making the finding that process wastewater overflow containing pollutants conveyed from the Manure Pit of the Riverview Facility to the Swale during the period from the construction of the Manure Pit to June 18, 2014, I considered Respondents' assertion that the only date the Manure Pit overflowed and contributed runoff to the Swale was the date of 2014 Inspection. *See* Resp. I. Br. at 7, 33. However, contrary to this argument, I find that a preponderance of evidence establishes that process wastewater overflow containing pollutants conveyed from the Manure Pit to the Swale during the period from the construction of the Manure Pit to June 18, 2014 on multiple occasions, as identified in Dr. Wang's calculations in Complainant's Modeling Evidence. Respondents concede that the Manure Pit at the Riverview Facility overflowed on the date of the 2014 Inspection, and further that this runoff overflow reached the Swale. *See* Resp. Reply Br. at 1, 3. Respondents, however, argue that the only date the Manure Pit contributed overflow runoff to the Swale was the day of the 2014 Inspection, asserting that this is supported by testimony from Respondents and Stephen Madden that they did not hear of or observe the Manure Pit overflowing on other occasions. *See* Resp. I. Br. at 7, 33 (citing Tr. 718, 840, 998). Although Respondents and Stephen Madden testified that they did not observe the Manure Pit discharge on any date aside from the day of the 2014 Inspection, *see* Tr. 718, 840, 998, I do not find that this testimony rebuts the credible evidence presented by Complainant establishing that the Manure Pit overflowed on numerous occasions from its construction to June 18, 2014. With regard to Stephen Madden's testimony, it is notable that while he reported that he has not observed the Manure Pit overflowing on any occasion, Tr. 718, he otherwise indicated in his testimony that he does not haul manure when there is going to be a lot of rain, due to concerns regarding runoff in transport, Tr. 716, suggesting his observation of the Manure Pit during heavy precipitation conditions is at least somewhat limited.

As for Respondents' testimony reporting they have never seen the Manure Pit overflow except for the day of the 2014 Inspection, *see* Tr. 840, 998, I do not find this testimony rebuts the substantial evidence of record reflecting that the Manure Pit overflowed multiple times over the period from the construction of the Manure Pit to June 18, 2014, including the detailed calculations of Dr. Wang discussed above. Respondents have argued that the amount of rainfall received at the time of the 2014 Inspection was anomalous, *see* Resp. Reply Br. at 9-10, and notably Respondent Josh Brown reported that the Riverview Facility received six inches of rain prior to the 2014 Inspection, based upon his observation of a rain gauge at his house in Armstrong, Iowa, s*ee* Tr. 88-89, 837-38, 947-48, 990, 993; *see also* Tr. 984 (testimony from Respondent Josh Brown identifying the location of his house). Contrary to these assertions, however, the evidence of record does not reflect that the Riverview Facility received the amount of rain reported by Josh Brown prior to the 2014 Inspection, and further, while the evidence does

reflect that the amount of rainfall received prior to the 2014 Inspection was significant, it does not reflect that such precipitation was anomalous. In his testimony, Respondent Josh Brown reported that he checks a rain gauge in his front yard daily, and that he observed that it was overflowing and contained over six inches of rain on the morning of the 2014 Inspection. *See* Tr. 990. Further, he reported that the amount of rain he observed in his rain gauge prior to the 2014 Inspection is consistent with a conversation he had with a neighbor who likewise reported having a full rain gauge. *See* Tr. 991. However, the reliability and accuracy of Respondent Josh Brown's rain gauge observation was undermined by his acknowledgement that he maintains his home rain gauge as a conversation piece, Tr. 990, and observes the rainfall for his curiosity and does not keep track of the data collected from the rain gauge, Tr. 1019-20. Additionally, in contrast to Respondent Josh Brown's report regarding rainfall prior to the 2014 Inspection, the daily precipitation data from the NCDC rain gauge station in Swea City reflects 1.74 inches of rain on June 15, 2014; .09 inches of rain on June 16, 2014; and 1.51 inches of rain on June 17, 2014, the date of the 2014 Inspection, reflective of a collective rainfall of 3.34 inches from June 15-17, 2014. *See* CX 20.2 at 35. As previously discussed, this NCDC rain gauge station in Swea City is located approximately five miles from the Riverview Facility, *see* Tr. 584, CX 20.2 at 5, and the precipitation data collected at this station is observational precipitation data certified by the National Oceanic and Atmospheric Administration, *see* Tr. 646-47, CX 20.2 at 5. Furthermore, the rainfall reported by Respondent Josh Brown prior to the 2014 Inspection is inconsistent with precipitation data submitted by Respondents in this proceeding from a Weather Underground data site in Estherville, Iowa, approximately 14 miles away from the Riverview Facility. *See* RX 8; *see also* CX 20.2 at 5 (identifying the location of the Weather Underground site in Estherville to the Riverview Facility). The Weather Underground data site in Estherville recorded .09 inches of rain on June 15, 2014; 2.92 inches of rain on June 16, 2014; and .02 inches of rain on June 17, 2014, for a collective rainfall of 3.03 inches from June 15-17, 2014. *See* RX 8. Additionally, there is no other support for a finding that the Riverview Facility received six inches of rain prior to the 2014 Inspection, aside from Respondent Josh Brown's report from his home rain gauge. As a result, I do not find that Respondent Josh Brown's report that the Riverview Facility received six inches of rain prior to the 2014 Inspection is accurate. Likewise, contrary to Respondents' arguments regarding the anomalous nature of the rainfall prior to the 2014 Inspection, the precipitation data from the NCDC rain gauge station in Swea City does not reflect that the rainfall received prior to the 2014 Inspection was anomalous during the period from the construction of the Manure Pit to June 18, 2014, *see* CX 20.2 at 11-35, and otherwise reflects a greater single day rainfall of 3.24 inches on May 17, 2013, than that recorded for the days during June 15-17, 2014 period. As a result, I do not find Respondents' contention that the Manure Pit only overflowed on the date of the 2014 Inspection, as the result of anomalous rainfall, to be supported, and otherwise find that the preponderance of evidence establishes that process wastewater overflow containing pollutants conveyed from the Manure Pit to the Swale during the period from the construction of the Manure Pit to June 18, 2014 on multiple occasions, as identified in Dr. Wang's calculations in Complainant's Modeling Evidence.

In addition to the process wastewater runoff from the Central Alley and Manure Pit, the evidence of record further demonstrates the Riverview Facility conveyed process wastewater runoff containing pollutants during the period from May 10, 2011 to June 18, 2014 from production areas of the Riverview Facility where runoff was not captured by a process

wastewater holding area, including the Feedstock Storage Area, Northern Alley, and Eastern Alley. As previously discussed, Dr. Wang determined that following the construction of the Manure Pit, approximately five percent of the runoff from the Riverview Facility remained uncontrolled, as it bypassed the Manure Pit and flowed directly from the Feedstock Storage Area, Northern Alley, and Eastern Alley into the Swale. CX 20 at 4-5, 8, 11; Tr. 553-56, 652-55. Dr. Wang further calculated the volume of runoff flowing from these uncontrolled areas to the Swale over the period from May 10, 2011 to June 18, 2014. *See* CX 20.2 at 67-84, 89-106. Notably, Dr. Wang's determination that runoff from certain production areas of the Riverview Facility remained uncontrolled following the installation of the Manure Pit, and flowed directly to the Swale, is consistent with Ms. Heikens' report that runoff from the Feedstock Storage Area bypassed the Manure Pit containment. *See* Tr. 1101-02, CX 55.3 at 4.

Additionally, observations and data collected from the 2014 and 2016 Inspections reflect that these uncontrolled areas were sources of process wastewater containing pollutants. During the 2014 Inspection, Mr. Urban observed process wastewater associated with stored supplies including ground hay and corn bales present in the Feedstock Storage Area.[65] *See* Tr. 98, 110-11; CX 1.5 at 4, 35, 36. Likewise, as previously noted, the concrete walls of the Eastern and Northern Alleys were constructed with holes, allowing for the flow of process wastewater through these areas. *See* Tr. 822-25, 1001, 1006-08; CX 8 at 7; *see also* CX 12.5; CX 28.1 (photographs depicting the exterior wall of the Northern Alley). During the 2016 Inspection, Mr. Draper and Mr. Urban observed process wastewater and manure solids flow from the Eastern and Northern Alleys of the Riverview Facility to the field located east, passing through and around hay bales in the field, before flowing into the Swale area. *See* Tr. 164-66, 387; CX 8 at 6, 8, 14; CX 8. 6 at 7, 58. Consistent with such observations, water quality testing preformed on Sample 3 from the 2016 Inspection, which was collected from the process wastewater observed flowing from these areas, reflected pollutants, including elevated levels of E. coli, chloride, ammoniacal nitrogen, total kjeldahl nitrogen, total phosphorous, total suspended solids, and biological oxygen demand. *See* CX 8 at 12, 14; CX 8.13 at 7-9. Upon his observations of process wastewater runoff from the Eastern and Northern Alleys, Mr. Draper determined that there were areas of the Riverview Facility where process wastewater was not captured by the Manure Pit and flowed into the Swale, and based upon his review of aerial photographs of the Riverview Facility, he concluded that this pathway for process wastewater existed during the period from 2011 to 2014, consistent with Dr. Wang's modeling. *See* Tr. 384, 390. As a result, the evidence presented by Complainant demonstrates that the Riverview Facility conveyed process wastewater runoff containing pollutants from uncontrolled areas of the Riverview Facility, including the Feedstock Storage Area, Northern Alley, and Eastern Alley, during the period from May 10, 2011 to June 18, 2014.

Although the Respondents raised several arguments for purposes of contesting either that process wastewater containing pollutants was present in the Feedstock Storage Area, Northern Alley, and Eastern Alley, or that such process wastewater would flow to the Swale from these uncontrolled areas, such assertions were not supported by the record. Notably, although

[65] Mr. Urban initially reported that he believed the runoff from the Feedstock Storage Area would flow to Manure Pit. *See* Tr. 110-11; CX 1.5 at 4, 35, 36. However, as noted, Dr. Wang and Ms. Heikens determined that runoff from this area was not captured by the Manure Pit, and instead remained uncontrolled, flowing directly to the Swale. *See* CX 20 at 5; Tr. 1101-02, CX 55.3 at 4.

Respondents reported only maintaining solid manure in the Northern Alley, Resp. I. Br. at 31 (citing Tr. 825-27, 828, 1003), this practice would not preclude process wastewater runoff from this area. Additionally, the reported presence of a slope in the Northern Alley would also not preclude process wastewater runoff, *see* Resp. I. Br. at 7-8 (citing Tr. 844-46, 848-49), such as that observed from this area by Mr. Draper and Mr. Urban during the 2016 Inspection, as discussed above. Likewise, although Respondents refute that manure was present in the Eastern Alley, and otherwise note that no cattle are maintained in this area, *see* Resp. I. Br. at 32- 33 (citing Tr. 815-16), the absence of manure and cattle in this area does not preclude the presence of process wastewater containing pollutants, such as that observed and sampled from this area during this 2016 Inspection, as discussed above. Accordingly, I do not find that Respondents rebutted the evidence presented by Complainant establishing that the Feedstock Storage Area, Northern Alley, and Eastern Alley, conveyed wastewater containing pollutants to the Swale during the period from May 10, 2011 to June 18, 2014.

The process wastewater runoff containing pollutants entered the tile drain inlet at the Swale on 41 days from May 10, 2011 to June 18, 2014.

Complainant has also established by a preponderance of the evidence that the process wastewater runoff in the Swale entered the tile drain inlet through the intake pipe when it exceeded the capacity of this area, that this occurred on 41 days over the period from May 10, 2011 to June 18, 2014, and that the process wastewater runoff entering into the tile drain inlet on these days contained pollutants. The finding that the process wastewater in the Swale entered the tile drain inlet through the intake pipe when the capacity of this area was exceeded is well supported by observational evidence offered by Complainant. During the 2014 Inspection, Mr. Urban and Mr. Roberts extensively observed the Swale, and more specifically, the intake pipe at the inlet of the Swale, and reported specific observations reflecting that the process wastewater in the Swale was entering the tile drain inlet through the intake pipe. Upon arrival at the Riverview Facility, Mr. Urban and Mr. Roberts observed ponded water in the Swale flowing into the perforated, orange intake pipe to the tile drain inlet in the Swale. *See* Tr. 81-83, 120-21, 201-02, 244-45, 256, 259, 266. Upon closer inspection of the tile drain inlet later in the 2014 Inspection, while collecting a sample from this location, Mr. Urban observed the appearance of water from the Swale being pulled into the intake pipe. *See* Tr. 124, 129. While at this close distance during the sample collection, Mr. Urban observed seeds on the surface of the water at the Swale moving in the direction of the intake pipe of the tile drain inlet at a rate of approximately two to three inches per second, indicative of movement of water from the Swale into the intake pipe. *See* Tr. 120, 128, 205-07; CX 47 at ¶ 4. Consistently, both Mr. Urban and Mr. Roberts reported that they heard the sound of water flowing into the intake pipe during the 2014 Inspection. Tr. 124, 260; CX 47 at ¶ 4; CX 48 at ¶ 4. Likewise, both Mr. Urban and Mr. Roberts reported that they observed the water level of the Swale recede over the duration of the 2014 Inspection, consistent with runoff in the Swale entering the tile drain inlet during this period. *See* Tr. 123-24, Tr. 252, 258-59, CX 48 at ¶ 4.

The observations of Mr. Urban and Mr. Roberts regarding process wastewater in the Swale entering the tile drain inlet during the 2014 Inspection are also consistent with review of aerial photographs of the Riverview Facility during the relevant period, which do not depict an overland drainage path for water impounded in the Swale. As noted by Complainant, Mr. Draper

testified that aerial photographs of the Riverview Facility from April 2011 through March 2015 depicted well-functioning cropland in the field across the entryway road from the Swale prior to Respondents' installation of the culvert, *see* Tr. 346, 356-57; *see also* CX 12.13; CX 12.15; CX 12.17 (referenced aerial photographs), and notably did not reflect visible runoff pathways, such as those observed in an aerial photograph following the installation of the culvert directing water into this field area, *see* Tr. 373-75; *see also* CX 12.34 (referenced aerial photograph following the installation of the culvert at the Riverview Facility). Indeed, consistent with Mr. Draper's testimony, the aerial photography of the Riverview Facility over the period from May 10, 2011 to June 18, 2014, including aerial photographs of the Riverview Facility submitted by Respondents in RX 11, does not reflect visible evidence of an overland drainage pathway for the water impounded in the Swale. *See, e.g.*, CX 12.15; CX 12.16; CX 12.17; RX 11 at 1-3 (aerial photographs of the Riverview Facility during the period from May 10, 2011 to June 18, 2014). The lack of a visible drainage pathway for the water impounded in the Swale is indicative that such impounded water did not drain through overland transfer during this period when the capacity of the Swale was exceeded, and is consistent with the observations of Mr. Urban and Mr. Roberts that the process wastewater in the Swale was entering the tile drain inlet during the 2014 Inspection.

As previously discussed, Respondents refute the aforementioned evidence demonstrating that the process wastewater in the Swale entered the tile drain inlet through the intake pipe when it exceeded the capacity of this area, and in doing so, cite to their testimony reporting that they did not hear or see water entering the inlet to the tile drainage system in the Swale during the 2014 Inspection, Resp. I. Br. at 8-9 (citing Tr. 856-58, 994-95), as well as testimony from Respondent Tony Brown contesting Mr. Urban's observations regarding the grass seeds on surface of the water at the Swale, Resp. I. Br. at 9 (citing Tr. 860).[66] However, the testimony cited by Respondents, as noted by Complainant, is inconsistent with admissions made by Respondents in their Answer. Although Respondents denied discharging pollutants to the East Fork of the Des Moines River in their Answer, they admitted that, during the 2014 Inspection, "[t]he inspector observed and sampled pollutant discharges emanating from the confinement pens and other production areas into the tile-drainage system at the Riverview Facility. Compl. ¶ 23: Answer ¶ 23. Likewise, in their Answer, Respondents also admitted that during the 2014 Inspection, "EPA observed and documented an open inlet into the tile drainage system at the Riverview Facility that received surface runoff and process wastewater from the Riverview Facility production areas." Compl. ¶ 28; Answer ¶ 28.[67] Further, in addition to being in conflict with the detailed and consistent observations of Mr. Urban and Mr. Roberts of process wastewater entering the intake pipe for the tile drain inlet at the Swale during the 2014 Inspection, and the lack of evidence of overland transfer of water impounded in the Swale from aerial photographs of the Riverview Facility during the relevant period, the cited testimony from

[66] As Mr. Roberts reported that Respondents were on the road, and not with Mr. Urban at the inlet to the tile drainage system while he collected the sample and made these observations, *see* CX 48 ¶ 5, Respondent Tony Brown's testimony on such observations was also undermined by the nature of his greater physical distance from the tile drain inlet.

[67] In their Answer, Respondents denied the allegations in Paragraphs 23 and 28 of the Complaint only to the extent that such paragraphs alleged the discharge of pollutants to the East Fork of the Des Moines River, and otherwise admitted the remaining allegations in these paragraphs, as reflected above. *See* Answer ¶¶ 23, 28.

Respondents is also inconsistent with testimony from Respondent Tony Brown acknowledging that tile drainage was installed in the Swale for the very purpose of improving drainage of this area. *See* Tr. 858. As a result, upon consideration, I do not find that the cited testimony from Respondents rebuts the compelling evidence of record reflecting that the process wastewater runoff in the Swale entered the tile drain inlet through the intake pipe over the period from May 10, 2011 to June 18, 2014. Contrary to the arguments of Respondents, I also do not find that the absence of audio or video evidence to corroborate Mr. Urban and Mr. Robert's observations of the tile drain inlet at the Swale during diminishes the credibility of this evidence.

Having established that process wastewater runoff in the Swale entered into the tile drain inlet through the intake pipe when it exceeded the capacity of this area, Complainant also has established that this occurred on 41 days over the period from May 10, 2011 to June 18, 2014, based on the well-supported calculations in Complainant's Modeling Evidence. As discussed in detail above, in order to determine the capacity of the Swale, Dr. Wang generated a three-dimensional representation of the Swale area using LiDAR data and geographic information systems software. *See* Tr. 612; *see also* CX 20.2 at 3 (LiDAR information of Riverview Facility); CX 20 at 30 (Figure 15, reflecting this three-dimensional representation). From this analysis, he determined the elevation of the tile drain inlet, the surface area of the Swale, and the depth of the Swale, and further, ascertained that the Swale had a total storage capacity of 165, 636 gallons. *See* CX 20 at 10, 30 (Figure 15); Tr. 614-16; CX 20.2 at 65. Dr. Wang further concluded that these findings regarding the Swale accurately reflect the actual conditions of the Swale during the relevant period, upon consideration of the data employed in his calculations, as well as observations of the Swale reported in the 2014 Inspection Report and accompanying photographs. *See* CX 20 at 10; Tr. 616-17. As previously noted, for purposes of applying conditions more advantageous to Respondents' than those reflected in the more representative field conditions, Dr. Wang also calculated the capacity of the Swale assuming that the inlet to the tile drain system had a higher elevation of 1231.50 feet, closer to the elevation of the road adjacent to the Swale at the Riverview Facility. Tr. 612-14, 616; CX 20 at 10, 17; CX 20.2 at 66, 88. However, as the field conditions identified by Dr. Wang are more representative of the actual conditions of the Swale, I find Dr. Wang's calculations pertaining to the field conditions to be the most accurate to the actual conditions in this matter.

As discussed in detail above, Dr. Wang applied the HEC-RAS and Curve Number Method modeling to determine the volume of runoff in the Swale, and the dates upon which runoff in the Swale would have exceeded the capacity of the Swale and entered the tile drain inlet, based upon the Swale capacity calculations previously discussed. From his modeling calculations, Dr. Wang identified 41 days during the period from May 10, 2011 to June 18, 2014, upon which the process wastewater runoff in the Swale under field conditions exceeded the capacity and entered the tile drain inlet, as reflected in Table A, above. As previously discussed, I find that in making these calculations, Dr. Wang utilized reliable methodology, calibrated modeling inputs to accurately reflect site conditions, and employed sufficient validation measures to verify modeling results. Notably, in addition to the validation measures employed by Dr. Wang to verify his findings, the reliability of his calculations pertaining to the volume of runoff in the Swale was further demonstrated by the relative consistency between the watershed area he identified as contributing runoff to the Swale, and the watershed area Ms. Heikens identified as contributing runoff to the culvert area developed by Respondents in the location of

the Swale. *See* Tr. 1104-1105 (testimony from Ms. Heikens regarding this comparison); CX 20 at 27 (Figure 12, watershed area for Swale identified by Dr. Wang, outlined in black); CX 55.3 at 11 (watershed area for culvert area identified by Ms. Heikens, as outlined in pink). Given the demonstrated reliability of these calculations, I accept Dr. Wang's calculations pertaining to the dates on which process wastewater runoff in the Swale entered the tile drain inlet over the period from May 10, 2011 to June 18, 2014, as well as the calculations pertaining to the volume of process wastewater draining into the tile drain inlet on these dates, as reflected in Table A. Accordingly, I find that Complainant has established that process wastewater runoff from the Riverview Facility entered the tile drain inlet at the Swale on 41 days over the period from May 10, 2011 to June 18, 2014.

Notably, Complainant has asserted that Dr. Wang's calculations reflect 42 days upon which process wastewater runoff in the Swale entered the tile drain inlet during the period of alleged violations, *see* Compl. I. Br. at 1-2, 31; Compl. Reply Br. at 11. However, this figure apparently includes June 18, 2014, the date upon which Complainant concedes the discharges emanating from the Swale ceased due to the intake pipe at the tile drain inlet being blocked. *See* Compl. I. Br. at 31, n.40. Complainant's argument for including this date is that runoff from the Swale could have entered the tile drainage system prior to Respondents blocking the intake pipe at the tile drain inlet. *See id.* However, Complainant has not established evidence in support of this position. Notably, the record does not identify the specific time of day that Respondents blocked the intake pipe. Further, even if such information were available, Dr. Wang's calculations do not break down the per hour volume conveyed from the Swale to the tile drainage system on this date in order to establish if process wastewater in the Swale was conveyed during the portion of the day prior to the intake pipe being blocked. *See* CX 20 at 33-34; CX 20. 2 at 88-106. Accordingly, I do not find that Complainant has established that runoff in the Swale entered the tile drain inlet on this date, and otherwise find that Complainant has established 41 days upon which this occurred from May 10, 2011 to June 18, 2014.

The record also demonstrates that the process wastewater runoff which entered the tile drain inlet at the Swale on these 41 days contained pollutants. In his observations of the Swale during the 2014 Inspection, Mr. Urban observed that the water in the Swale had an appearance consistent with process wastewater and an odor of manure, consistent with the presence of pollutants in this water. Tr. 125; *see also* CX 1.14 at 2 (notes from Mr. Urban reflecting that water taken from the Swale was brown and had the odor of manure). Further, water quality testing performed from the sample of water collected from the Swale during the 2014 Inspection confirmed the presence of such pollutants, demonstrating very high levels of ammoniacal nitrogen, total kjeldahl nitrogen, biological oxygen demand, chloride, total phosphorus, and E. coli. *See* CX 1 at 11; CX 1.14 at 1. With specific regard to the E. coli present in this sample, the laboratory test results reflect an E. coli count of 4,110,000. CX 1 at 11; CX 1.14 at 1. As a result, it is apparent that pollutants were present in the process wastewater runoff in the Swale at the time of the 2014 Inspection. Additionally, water quality testing of Sample 4 from the 2016 Inspection, collected from runoff from the Swale, including process wastewater runoff from the Riverview Facility, as well as rainwater runoff from the watershed area contributing to the Swale, *see* Tr. 161, 387-88, 886; CX 8 at 12, 14; CX 8. 6 at 58; *see also* CX 8.7 at 2-3 (identifying the location where Sample 4 was collected), also demonstrated the presence of pollutants, including elevated levels of E. coli, chloride, ammoniacal nitrogen, total kjeldahl

nitrogen, total phosphorous, total suspended solids, and biological oxygen demand. *See* CX 8 at 12, 14; CX 8.13 at 10-12. As this sample from the 2016 Inspection was collected from the Swale when the Manure Pit was not observed to be overflowing, *see* Tr. 165, this evidence demonstrates that pollutants were present in the process wastewater runoff at the Swale even in circumstances when the process wastewater holding areas of the Riverview Facility were not contributing overflow to this runoff. Although Mr. Hentges suggested that the presence of pollutants in the runoff in the Swale could be attributable to sources other than the Riverview Facility, he provided no support for this position. *See* RX 2 at 2, 6. Further, as discussed in depth above, as it has been established that the Riverview Facility contributed process wastewater containing pollutants to the Swale, it follows that the Riverview Facility is a source of the pollutants found in the process wastewater runoff in the Swale. Accordingly, Complainant has established that process wastewater runoff containing pollutants entered the tile drain inlet at the Swale on 41 days over the period from May 10, 2011 to June 18, 2014, as reflected above in Table A.

The tile drainage system conveyed the process wastewater runoff containing pollutants from the Riverview Facility to the East Fork of the Des Moines River on these 41 days from May 10, 2011 to June 18, 2014.

Finally, the evidence of record establishes that it is more likely than not that the tile drainage system at the Riverview Facility conveyed the process wastewater runoff to the East Fork of the Des Moines River on each of the 41 days in which it entered the tile drain inlet over the period from May 10, 2011 to June 18, 2014, and that such process wastewater runoff conveyed to the East Fork of the Des Moines River on these days contained pollutants. As discussed, during the 2016 Inspection, Mr. Urban and Mr. Draper ascertained the location of the tile drain outlet for the inlet located at the Swale during the 2014 Inspection, and determined that it was approximately 40 yards away from the banks of the East Fork of the Des Moines River, *see* Tr. 175, 406; CX 8 at 9; CX 8.6 at 37-40, and approximately five to six feet in elevation above the banks of the East Fork of the Des Moines River, *see* Tr. 175, 406-07; CX 8 at 9; CX 8.6 at 38. With this information determined, Dr. Wang performed a flow analysis of the runoff in the tile drainage system to determine whether runoff entering the inlet to the tile drainage system discharged into the East Fork of the Des Moines River, based upon LiDAR data for the tile drainage system at the Riverview Facility, as discussed in detail above. *See* CX 44; CX 45; Tr. 624-28; *see also* CX 33 (LiDAR data for Riverview Facility and location of tile drain outlet). From this analysis, Dr. Wang determined that the tile drain outlet had an elevation 35 feet lower than the elevation of the tile drain inlet, *see* Tr. 624; CX 45, and further, he determined that due to this elevation differential, runoff exiting the tile drain outlet would be under a high head pressure commensurate with the 35-foot elevation differential, *see* Tr. 625-26. Considering this head pressure and the determined elevation of banks of the East Fork of the Des Moines River at the tile drain outlet, Mr. Wang concluded that outflow from the tile drain outlet would only be precluded from flowing to the East Fork of the Des Moines River if met with pressure equal to the high head pressure from this 35-foot elevation differential. *See* CX 45; Tr. 625-26. Even more specifically, Dr. Wang concluded from these calculations that runoff would continue to flow from the tile drain outlet even in circumstances where the tile drain outlet were submerged in 10 feet of water. Tr. 625-26. As Dr. Wang's flow analysis is founded upon evaluation of the actual conditions at the Riverview Facility and the tile drain outlet, I find this to be probative and

reliable evidence, and find Dr. Wang's overall conclusion regarding this flow analysis is well-supported.

Further, as the record reflects the absence of any credible evidence supporting that either the tile drain system was occluded, or that outflow from the tile drain outlet was precluded by the flow pressure of the East Fork of the Des Moines River, at any point during the period from May 10, 2011 to June 18, 2014, I find that the evidence presented by Complainant establishes that it is more likely than not that the tile drainage system conveyed the process wastewater runoff from the Riverview Facility to the East Fork of the Des Moines River on the 41 days from May 10, 2011 to June 18, 2014 upon which such process wastewater entered the tile drain inlet. In their arguments that Complainant has not met its burden of proof in establishing that the runoff entering the tile drain inlet discharged to the East Fork of the Des Moines River, Respondents rely upon the testimony and analysis of Mr. Hentges. *See* Resp. I. Br. at 11, 14-19; Resp. Reply Br. at 8-9. As discussed above, in his testimony and analysis, Mr. Hentges presented two theories under which he asserted that outflow from the tile drain outlet would be precluded. First, in his testimony, Mr. Hentges offered the possibility that the tile drainage system at the Riverview Facility had a plug occluding runoff from exiting the tile drain outlet. *See* Tr. 1140-50, 1255-56. With regard to the second theory, Mr. Hentges opined his report in RX 2 and his testimony that the tile drain outlet either would not or may not discharge when it was submerged by the East Fork of the Des Moines River, and he further concluded that the tile drain outlet was submerged on the date of the 2014 Inspection. *See* RX 2 at 3; Tr. 1153-54, Tr. 1157-58, 1267. For the reasons described below, I do not find that the evidence of record supports that the outflow of the tile drain outlet was occluded or precluded under either of these theories during the period from May 10, 2011 to June 18, 2014.

As previously noted, in his testimony, Mr. Hentges offered the possibility that the tile drainage system at the Riverview Facility had a plug occluding runoff from exiting the tile drain outlet. *See* Tr. 1140-50, 1255-56. In support of this possibility, Mr. Hentges referenced sediment found by Respondents in a portion of tile line removed following the period from May 10, 2011 to June 18, 2014, as depicted in the photograph in RX 33, as well as his own experience with aging tile lines deteriorating over time. *See* Tr. 1140-45; RX 33. Although Mr. Hentges acknowledged in his testimony that he could not state with any certainty as to whether the tile line for the tile drainage system at the Riverview Facility was plugged at any location, he nevertheless offered that this was a possibility. *See* Tr. 1256. However, the evidence of record does not support a finding that the tile drainage system at the Riverview Facility had a plug occluding runoff from exiting the tile drain outlet during the period from May 10, 2011 to June 18, 2014. Notably, such a finding is inconsistent with the observations of Mr. Urban and Mr. Roberts regarding process wastewater in the Swale entering the tile drain inlet during the 2014 Inspection, as discussed above, *see supra* at 88, as well the lack of an overland drainage pathway for runoff from the Swale in aerial photographs of the Riverview Facility during the period from May 10, 2011 to June 18, 2014, as discussed above, *see supra* at 88-89. Further, this theory from Mr. Hentges is also inconsistent with Respondents' arguments in this proceeding, as Respondents in their Post-Hearing Brief clarified that are not asserting that the tile line for the tile drainage system at the Riverview Facility was plugged. *See* Resp. I. Br. at 14. Instead, Respondents argue that flow in the tile line outlet could have been reduced by sediment, and assert that could impact the ability of water to flow out of the tile drain outlet, in a manner aside

from simply extending the dates of discharge. *See* Resp. I. Br. at 14-16. However, this theory also appears to be speculative and lacking support. Notably, in providing testimony regarding how restriction from a "clogged" tile drain line would impact outflow, Mr. Hentges stated that this condition would reduce the rate of flow, but otherwise acknowledged that water could discharge from an outlet under such conditions, and did not offer that such a limitation on flow would preclude outflow. *See* Tr. 1277-78. As a result, I do not find that the evidence of record supports that the tile drain outlet was either occluded or prevented from discharging to the East Fork of the Des Moines River by a plug or reduced flow from sediment during the period from May 10, 2011 to June 18, 2014.

Likewise, the evidence of record does not support Mr. Hentges' theory that the process wastewater runoff from the Swale did not exit the tile drain outlet in submerged conditions during the period from May 10, 2011 to June 18, 2014. The record does not reflect that the condition of being submerged precluded outflow from the tile drain outlet and it otherwise does not reflect any evidence that the outflow from the tile drain outlet was precluded by the flow pressure of the East Fork of the Des Moines River during the period from May 10, 2011 to June 18, 2014 more broadly. As previously noted, Mr. Hentges concluded in his report in RX 2 that "[if] the tile line outfalls were submerged by the flow in the river, a discharge would not have occurred due to the head pressure of water in the river pushing back on the water in the tile line." RX 2 at 3. In support of this position, in his testimony, Mr. Hentges recalled that the surface of the water at the location of the submerged tile drain outlet was not observed to move during May 2018 Site Visit, *see* Tr. 1152-53; *see also* RX 24-25 (photographs referenced in testimony), and he provided his opinion that the reason Respondents did not feel outflow from the tile drain outlet during their investigations of the tile drain outlet in 2018 in submerged conditions, depicted in RX 26 and RX 41, was because there was no flow from the submerged tile drain outlet, *see* Tr. 1153-54; *see also* RX 26 and RX 41 (photographs of Respondents' investigations of the tile drain outlet in 2018). Notably, in response to this argument, Complainant has offered the observations of Dr. Wang and Mr. Draper regarding perceived water movement at the tile drain outlet under submerged conditions during the April 2018 Site Visit. *See* Compl. I. Br. at 39-40 (citing Tr. 425-26, 629); Compl. Reply Br. at 27 (citing Compl. I. Br. at 39-40). However, none of the evidence cited by the parties regarding the outflow or lack of flow from the tile drain outlet following the period from May 10, 2011 to June 18, 2014 appropriately relates back to conditions during this period. These observations regarding the tile drain outlet following the period from May 10, 2011 to June 18, 2014 occurred well after the date that Respondent's blocked the intake pipe for the tile drain inlet at the Swale, obstructing process wastewater from entering the inlet. *See* Tr. 855-65, 860, 963. As a result, the flow dynamics of the tile drainage system were fundamentally altered on June 18, 2014, and the observations cited by Respondents and Complainant following this date cannot reasonably support the flow conditions during the period from May 10, 2011 to June 18, 2014.

Instead, I find that Dr. Wang's flow analysis of the runoff in the tile drainage system during the period from May 10, 2011 to June 18, 2014 is supported, and I find that such analysis supports outflow from the tile drain outlet during this period. In contrast to the unconditional conclusion expressed in his report it RX 2 that the tile drain outlet would not discharge to the river in submerged conditions, in his testimony, Mr. Hentges acknowledged that whether or not water exited the tile drain outlet when submerged would depend on the difference in head

pressure from runoff exiting the tile drain outlet and the head pressure of the river. *See* Tr. 1267, 1269-70. Additionally, consistent with Dr. Wang's flow analysis, Mr. Hentges acknowledged that if the head pressure of water exiting the outlet exceeds the pressure exerted by the river in submerged conditions, water would exit the outlet into the river. *See* Tr. 1269-70, 1273-74. While Mr. Hentges expressed his opinion that the flow conditions at the tile drain outlet during the period of allegations simply could not be ascertained, *see* Tr. 1271, 1279-80, he acknowledged that he was not aware of the elevation for the outlet of the tile drainage system at the Riverview Facility, and otherwise was not aware of the difference in elevation between the tile drain inlet and the tile drain outlet, *see* Tr. 1268. Further, Mr. Hentges did not perform his own flow analysis for the tile drainage system during the period from May 10, 2011 to June 18, 2014, and did not provide substantive critique of Dr. Wang's flow analysis. Accordingly, I do not find that the evidence provided by Mr. Hentges supports the position of Respondents that outflow from the tile drain outlet would be precluded under submerged conditions. Having ascertained this, I do not need to parse through the evidence submitted by Respondents or Complainant to ascertain whether the tile drain outlet was submerged on each of the 41 days during the period from May 10, 2011 to June 18, 2014 upon which process wastewater entered the tile drainage system for purposes of determining the outflow from the tile drain outlet.

Instead, having accepted Dr. Wang's flow analysis for the tile drain outlet, I find that outflow from the tile drain outlet during the period from May 10, 2011 to June 18, 2014 would only be precluded from flowing to the East Fork of the Des Moines River if met with pressure equal to the high head pressure of the water flowing out of the tile drainage system with a 35-foot elevation differential. *See* CX 45; Tr. 625-26. As there is no evidence of record that the flow pressure of the East Fork of the Des Moines River was ever sufficient to meet this pressure during the period from May 10, 2011 to June 18, 2014, even in submerged conditions, I do not find that the record supports that outflow from the tile drain outlet was precluded by the flow pressure of the river during this period, and otherwise find that the evidence of record establishes that it is more likely than not that the process wastewater runoff entering the tile drainage system through the inlet at the Swale on 41 days from May 10, 2011 to June 18, 2014 discharged to the East Fork of the Des Moines River on each of these days.

Further, having determined that the evidence of record establishes that it is more likely than not that the process wastewater runoff entering the tile drainage system through the inlet at the Swale on 41 days from May 10, 2011 to June 18, 2014 discharged to the East Fork of the Des Moines River, I also find that the record demonstrates that the process wastewater runoff discharging to the East Fork of the Des Moines River contained pollutants. While some of the pollutants identified in samples of the process wastewater runoff in the Swale from the 2014 and 2016 Inspections would not be impacted by time of transport, *see* CX 1.14 at 1; CX 8.13 at 10-12 (water quality reports for samples taken from the Swale area during the 2014 and 2016 Inspections identifying pollutants present), as identified by Dr. Wang, the presence of E. coli bacteria is subject to decay over time, *see* CX 20.1 at 3; *see also* Tr. 291-92 (testimony from Mr. Draper regarding E.coli fate in runoff). Accordingly, as discussed above, Dr. Wang performed calculations on the fate and transport of E. coli bacteria in runoff from the Swale to the outlet of the tile drainage system, based upon the presence of E coli in Sample 1 from the 2014 Inspection, taken at the tile drain inlet,. *See* CX 20.1 at 3-4. As these calculations considered the actual conditions of the process wastewater traveling from the Swale through the tile drainage

system at the Riverview Facility, including the ascertained levels of E. coli bacteria collected from the Swale during the 2014 Inspection and the length of the tile drainage system at the Riverview Facility, I find them to be well-supported. *See* CX 20.1 at 3-4. From these calculations, Dr. Wang determined that the runoff exiting the tile drain outlet would have an E. coli concentration of 229,051 counts per 100 milliliters for the calculated travel time through the tile drainage system of 1.5 hours, and would have an E. coli concentration of 97,390 counts per 100 milliliters for a longer than calculated travel time of one day. CX 20.1 at 3-4. Notably, as addressed above, Dr. Wang observed that both of these results of his calculations exceed state water quality standards for the impaired portion of the East Fork of the Des Moines River of 126 counts per 100 milliliters by "several orders of magnitude." CX 20.1 at 3. As a result, the record reflects that the process wastewater runoff discharging from the tile drain outlet into the East Fork of the Des Moines River on the 41 identified days over the period from May 10, 2011 to June 18, 2014 contained pollutants, even when accounting for the decay of E. coli.

B. The Riverview Facility was a Point Source during the period from May 10, 2011 to June 18, 2014.

With regard to the remaining disputed element pertaining to liability for the alleged violations, Complainant has also established by a preponderance of the evidence that the Riverview Facility was a point source under the CWA as a Medium CAFO during the period from May 10, 2011 to June 18, 2014. As previously noted, the definition of a "point source" in the CWA encompasses "any discernible, confined and discrete conveyance," specifically including a "concentrated animal feeding operation." *See* 33 U.S.C. § 1362(14). In turn, the relevant regulations define a CAFO as an animal feeding operation that is defined as a "Large CAFO" or as a "Medium CAFO." 40 C.F.R. § 122.23(b)(2). The definition for a "Medium CAFO" under the regulations encompasses an animal feeding operation with "300 to 999 cattle other than mature dairy cows or veal calves," where "[p]ollutants are discharged into waters of the United States through a man-made ditch, flushing system, or other similar man-made device." 40 C.F.R. § 122.23 (b)(6). The record reflects that the Riverview Facility met this definition of a Medium CAFO during the period from May 10, 2011, to June 18, 2014, and therefore was a point source during this period.

Respondents admitted that the Riverview Facility was an animal feeding operation for cattle during the relevant period. *See* Compl. ¶ 21; Answer ¶ 21. Additionally, Respondents have stipulated that at all times relevant to the alleged violations in this proceeding, the Riverview Facility had greater than 300 head of cattle present for 45 days or more in any 12-month period. JX 1 at ¶ 2. Further, as discussed above, Complainant has established by a preponderance of the evidence that Respondents discharged pollutants from the Riverview Facility into the East Fork of the Des Moines River through the tile drainage system on 41 days during the period from May 10, 2011 to June 18, 2014. Likewise, it is undisputed that the East Fork of the Des Moines River is a water of the United States, and therefore a navigable water pursuant to 33 U.S.C. § 1362(7). *See* JX 1 at ¶ 2; Compl. ¶ 31; Answer ¶ 32. As a result, the only remaining component of a Medium CAFO necessary to determine that the Riverview Facility meets this definition is whether the pollutants that were discharged from the Riverview Facility into the East Fork of the Des Moines River through the tile drainage system were discharged through "a man-made ditch, flushing system, or other similar man-made device." 40

C.F.R. § 122.23 (b)(6). It is clear from the record that the tile drainage system at the Riverview Facility was a man-made flushing system. There has been no contention that the tile drainage system at issue is anything other than a man-made construction, and the finding that the tile drainage system is a man-made construction is consistent with testimony from Respondent Tony Brown reflecting that the tile drainage system was installed in the Swale to improve drainage. *See* Tr. 858. Likewise, the record otherwise reflects that the tile drainage system at the Riverview Facility was a flushing system. This is both consistent with the aforementioned testimony from Respondent Tony Brown regarding the purpose for which the tile drainage system was installed at the Swale, *see* Tr. 858, as well as testimony from Mr. Urban and Mr. Draper describing how tile drainage systems are used in an agricultural context to drain water to assist crop growth, *see* Tr. 58-59, 299. Accordingly, the record reflects that the tile drainage system at the Riverview Facility was a man-made flushing system, and therefore, that the Riverview Facility is a Medium CAFO during the relevant period.

As a result, Complainant has established that the Riverview Facility was a point source during the period from May 10, 2011 to June 18, 2014. Further, having established by a preponderance of evidence that the Respondents discharged pollutants from the Riverview Facility into the East Fork of the Des Moines River on 41 days during the period from May 10, 2011 to June 18, 2014, and that the Riverview Facility was a point source pursuant to the CWA during this period, Complainant has satisfied its burden of proof with regard to the two disputed elements of the alleged violations Section 301(a) of the CWA, 33 U.S.C. § 1311(a). Accordingly, Complainant has met its burden of proof in establishing Respondents' liability for the alleged violations of Section 301(a) of the CWA, 33 U.S.C. § 1311(a), on 41 days during the period from May 10, 2011 to June 18, 2014.

iii. Discussion of De minimis Exception or Defense to Liability

Having determined that Complainant has established Respondents' liability for 41 days of unauthorized discharges over the period from May 10, 2011 to June 18, 2014 in violation of Section 301(a) of the CWA, 33 U.S.C. § 1311(a), I turn to Respondents' argument that such unauthorized discharges are excused by an exception or defense to liability for de minimis discharges of pollutants. As previously discussed, Respondents assert that *Hawai'i Wildlife Fund* establishes an exception or defense to liability for de minimis discharges of pollutants. *See* Resp. I. Br. at 33-34; Resp. Reply Br. at 14-15. Additionally, Respondents argue that such an exception or defense to liability is further supported by caselaw predating *Hawai'i Wildlife Fund*, including *Kentucky Waterways Alliance* and *Arkansas Poultry Federation*. *See* Resp. I. Br. at 34 (citing *Kentucky Waterways Alliance*, 540 F.3d at 491 (quoting *Greenbaum,* 370 F.3d at 534)); Resp. Reply Br. at 14-15 (citing *Arkansas Poultry Federation*, 852 F.2d at 329). In contrast, Complainant argues that there is no exception to liability or defense under the CWA for de minimis discharges of pollutants, and further, that the discharges at issue in this proceeding are not de minimis. *See* Compl. Reply Br. at 1-4. Upon consideration, I do not find that there is an exception to liability or defense for de minimis discharges of pollutants applicable to the CWA violations at issue in this matter, as discussed below.

Contrary to Respondents' arguments, *Hawai'i Wildlife Fund* cannot be construed as granting an exception or defense to liability for de minimis discharges of pollutants from a point

source in violation of the CWA. That case, as indicated by the parties, addressed whether the CWA governs indirect discharges of pollutants from a point source to a navigable water through a non-point source, specifically evaluating this issue within the context of injection wells discharging pollutants through groundwater to a navigable water. *See Hawai'i Wildlife Fund*, 886 F.3d at 747. The singular de minimis reference in *Hawai'i Wildlife Fund* cited by Respondents appears within the Ninth Circuit's discussion of applying a "fairly traceable" standard to determine whether the CWA governs such indirect discharges. *See id.* Unlike *Hawai'i Wildlife Fund*, the present matter does not involve such indirect discharges through a non-point source, like groundwater.[68] Moreover, during the pendency of this matter, the United States Supreme Court vacated the Ninth Circuit's decision in *Hawai'i Wildlife Fund* in *County of Maui v. Hawai'i Wildlife Fund*, 140 S.Ct. 1462 (2020). In *County of Maui*, the Supreme Court rejected the "fairly traceable" standard applied by the Ninth Circuit in *Hawai'i Wildlife Fund*, and instead held that the CWA requires a permit when there is a direct discharge of pollutants from a point source into navigable waters or when there is the functional equivalent of a direct discharge. *County of Maui*, 140 S.Ct. at 1476-78. Accordingly, this is the appropriate standard, which has been considered in this determination. Notably, *County of Maui* does not establish a de minimis exception or defense to liability. *See generally County of Maui*, 140 S.Ct. 1462.

Additionally, caselaw predating *Hawai'i Wildlife Fund* cited by Respondents as supporting an exception or defense to liability for de minimis discharges of pollutants in violation of the CWA also does not support an exception or defense to liability applicable to this matter. In *Kentucky Waterways Alliance*, the Sixth Circuit, in evaluating EPA's approval of Kentucky's water quality antidegradation rules pursuant to Section § 303(c) of the CWA, 33 U.S.C. § 1313(c), acknowledged an administrative law principle which allows agencies to create unwritten exceptions to a statute or a rule for de minimis matters unless the applicable statute or regulation employs "extraordinarily rigid" language. *Kentucky Waterways Alliance*, 540 F.3d at 491 (citing *Greenbaum,* 370 F.3d at 534). Nothing within this discussion in *Kentucky Waterways Alliance* establishes a de minimis exception or defense to liability for violations of the prohibition on the unauthorized discharge of pollutants in Section 301(a) of the CWA, 33 U.S.C. § 1311(a), at issue in this matter. *See id.* Likewise, *Arkansas Poultry Federation* does not provide support for an exception or defense to liability for de minimis discharges of pollutants in violation of the CWA applicable to this proceeding. Rather, that case addresses the validity of regulations promulgated by EPA defining terms for purposes of the national pretreatment standards, and involves EPA acknowledging that the challenged regulations pertaining to industrial users of publicly owned treatment works, not at issue in the present matter, require more than de minimis causation. *Arkansas Poultry Federation*, 852 F.2d at 329. As, a result, Respondents have not provided legal support for their contention that there is an exception or defense to liability for de minimis discharges of pollutants in violation of the CWA applicable to this matter.

[68] As previously noted, Respondents, in a footnote in their Initial Post-Hearing Brief, argue that this matter is similar to cited cases addressing the circumstances in which pollutants may be conveyed to a navigable water through groundwater, as Respondents assert this case, like such cited cases, presents "the question of the Clean Water Act's regulation over groundwater." Resp. I. Br. at 19 n.6. Contrary to this statement, the violations of the CWA in this matter, as discussed above, relate to the discharge of pollutants though a tile drainage system, and not through groundwater.

Finally, it is worth noting that Respondents' characterization of the discharges of pollutants established in this matter as de minimis is not supported by the record. As discussed above, the pollutant levels associated with the process wastewater runoff from the Riverview Facility discharged from the Swale to the East Fork of the Des Moines River through the tile drainage system were significant, and are not consistent with a de minimis characterization. *See supra* at 91-92, 95-96; *see also* CX 1.14 at 1; CX 8.13 at 10-12 (water quality reports for samples taken from the Swale area during the 2014 and 2016 Inspections). Accordingly, even if there were an exception or defense to liability for de minimis discharges of pollutants in violation of the CWA available to Respondents in this proceeding, such an exception or defense to liability would not be supported by the facts in this matter.

c. Conclusion on Liability

For the forgoing reasons, I find that Complainant has met its burden in this proceeding, as it has demonstrated by a preponderance of the evidence that Respondents violated 33 U.S.C. § 1311(a) on 41 days during the period from May 10, 2011 to June 18, 2014.[69] Further, the record does not reflect that such violations of the CWA are excused by a viable defense.

VI. PENALTY

Having determined that Respondents violated 33 U.S.C. § 1311(a) on 41 days during the period from May 10, 2011 to June 18, 2014, I must make a determination with regard to what relief is appropriate for these violations. As previously discussed, Section 309(g)(1) of the CWA authorizes the assessment of a civil administrative penalties for violation of the prohibition against pollutant discharges in 33 U.S.C. § 1311(a). In turn, Section 309(g)(2)(B) of the CWA specifies the penalty amounts that may be assessed, namely, up to $10,000 per day for each day during which a violation continues and a maximum penalty not to exceed $125,000. 33 U.S.C. § 1319(g)(2)(B). These levels have been increased over time as required by the Federal Civil Penalties Inflation Adjustment Act of 1990, 28 U.S.C. § 2461 note; Pub. L. 101-410, as amended by the Debt Collection Improvement Act of 1996, 31 U.S.C. § 3701 note; Pub. L. No. 104-134, Section 31001(s), and the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015, 28 U.S.C. § 2461 note; Pub. L. 114-74, Section 701. Consequently, penalties of up to $16,000 per day and $177,500 in total may be assessed for violations occurring after January 12, 2009, and through December 6, 2013; and penalties of up to $16,000 per day and $187,500 in total may be assessed for violations occurring after December 6, 2013, and through November 2, 2015. *See* 40 C.F.R. § 19.4.

Where a violation has occurred and the complainant has sought a civil administrative penalty, I must "determine the amount of the recommended civil penalty based on the evidence in the record and in accordance with any penalty criteria set forth in the Act" and "explain in

[69] Specifically, these days are: May 20, 2011; May 21, 2011; May 22, 2011; May 23, 2011; May 26; 2011; May 27, 2011; June 15, 2011; June 16, 2011; June 17, 2011; June 19, 2011; June 20, 2011; June 21, 2011; June 22, 2011; June 23, 2011; April 20, 2012; April 21, 2012; April 10, 2013; April 11, 2013; April 12, 2013; April 13, 2013; April 19, 2013; April 20, 2013; April 21, 2013; April 23, 2013; April 24, 2013; May 2, 2013; May 17, 2013; May 18, 2013; May 19, 2013; May 20, 2013; May 21, 2013; June 22, 2013; June 23, 2013; June 24, 2013; June 25, 2013; April 28, 2014; April 29, 2014; April 30, 2014; June 2, 2014; June 15, 2014; and June 17, 2014.

detail in the initial decision how the penalty to be assessed corresponds to any penalty criteria set forth in the Act." 40 C.F.R. § 22.27(b). Section 309(g)(3) of the CWA sets forth such criteria, requiring that any penalty assessed "take into account the nature, circumstances, extent and gravity of the violation, or violations, and, with respect to the violator, ability to pay, any prior history of such violations, the degree of culpability, economic benefit or savings (if any) resulting from the violation, and such other matters as justice may require." 33 U.S.C. § 1319(g)(3).

As observed by the EAB, "[t]he CWA 'prescribes no precise formula by which these factors much be computed' or otherwise evaluated." *San Pedro Forklift, Inc.*, 15 E.A.D. at 878 (quoting *Britton Constr. Co.*, 8 E.A.D. 261, 278 (EAB 1999)). Moreover, while I am required to "consider any civil penalty guidelines issued under the Act" when calculating a penalty, 40 C.F.R. § 22.27(b), EPA has not developed a penalty policy specific to litigation under the CWA, *see, e.g., Stevenson*, 16 E.A.D. 151, 169 (EAB 2013). In the present case, this was specifically acknowledged by Complainant at hearing and in its post-hearing briefing. *See* Tr. 22; Compl. I. Br. at 42. In the absence of such a policy, "it is appropriate . . . to analyze directly each of the statutory factors." *Stevenson*, 16 E.A.D. at 169 (citing *Phoenix Constr. Servs. Inc.*, 11 E.A.D. 379, 395 (EAB 2004)).

Penalty calculations under the CWA are "highly discretionary." *Tull v. United States*, 481 U.S. 412, 426-27 (1987). That being said, if the assessed penalty differs from the penalty proposed by the Agency, I must "set forth in the initial decision the specific reasons for the increase or decrease." 40 C.F.R. § 22.27(b). Complainant has proposed the assessment of a penalty in the amount of $96,000. *See* Compl. I. Br. at 1, 42. As noted above, the Rules of Practice dictate that Complainant bears the burden of presentation and persuasion as to the appropriateness of the proposed penalty. *See* 40 C.F.R. § 22.24(a). The EAB has held that where, as here, a statute enumerates specific factors that EPA "shall" consider in its assessment of a penalty, a complainant is required to present evidence demonstrating that it considered each of those factors, and that the proposed penalty is supported by its analysis, in order to make a prima facie case that the proposed penalty is appropriate. *See CDT Landfill Corp.*, 11 E.A.D. 88, 120-22 (EAB 2003).

In the present matter, while Complainant did provide certain evidence with regard to the statutory factors, and further asserted that it considered such factors, it did not demonstrate that that the proposed penalty is supported by its analysis. In support of its proposed penalty, Complainant offered testimony from Mr. Draper addressing several statutory penalty factors, *see* Tr. 433-47, but in such testimony, Mr. Draper did not explain the methodology employed in calculating the proposed penalty in accordance with these factors. Further, with regard to calculating the economic benefit or savings received by Respondents, as discussed further below, Mr. Draper provided figures based upon a broader period of time than the established period of violations, and Complainant did not provide evidence detailing Mr. Draper's calculations on this factor. Likewise, although Complainant reported considering the statutory factors in calculating the proposed penalty, *see* Compl. I. Br. at 42-53, Complainant did not provide a clear explanation of the methodology employed in arriving at the proposed penalty amount, and notably did not identify a specific sum for Respondents' economic benefit or savings for the

established violations. Accordingly, I do not find that Complainant has established a prima facie case that the proposed penalty is appropriate.

a. Nature, Circumstances, Extent, and Gravity of Violations

In evaluating the nature, circumstances, extent, and gravity of the established violations in this matter, it must be acknowledged that the evidence of record reflects that the violations were associated with actual harm to the East Fork of the Des Moines River from discharges occuring over a period of several years. Further, the record establishes that the discharges contained significant levels of pollutants associated with deleterious effects on water quality, including significant levels of E. coli, a pollutant associated with risks to human health. Accordingly, the penalty must be commensurate with this significant harm.

In support of the proposed penalty, Complainant argues that the violations in this matter caused actual harm to the East Fork of the Des Moines River. Compl. I. Br. at 45-46. Complainant asserts that the record establishes that the pollutants in the discharges from the Riverview Facility are not only associated with eutrophication and harm to stream biota, but also, with regard to the presence of E. coli, are harmful to human health. *See* Compl. I. Br. at 44-46. Additionally, Complainant notes that the East Fork of the Des Moines River is impaired for recreational use, in part due to uncontrolled runoff from feedlots. Compl. I. Br. at 45 (citing CX 26 at 27). Finally, Complainant asserts that the frequency and duration of the violative discharges must be considered in evaluating the gravity of the violations.

In contrast to Complainant's arguments, Respondents, as discussed above, assert that any discharges of pollutants would have been de minimis. *See* Resp. I. Br. at 33-34; Resp. Reply Br. at 14-15. However, in asserting this argument, Respondents have not provided an explanation for how such discharges would be considered de minimis, considering the pollutants contained in such discharges and the established duration of the discharges. Nor have they supplied evidence to counter the significant evidence offered by Complainant regarding the deleterious effect of process wastewater runoff and the impaired condition East Fork of the Des Moines River.

Upon review of the evidence, I agree with Complainant that the record demonstrates that the violations at issue are associated with actual harm to the East Fork of the Des Moines River. In contradiction to the argument raised by Respondents, the record does not reflect that the discharges of pollutants from the Riverview Facility were de minimis. Samples of runoff taken from the Swale, both during the 2014 Inspection when the Manure Pit was observed to overflow, and during the 2016 Inspection, when the Manure Pit was not observed to overflow, reflect significant levels of pollutants including elevated levels of E. coli, chloride, ammoniacal nitrogen, total kjeldahl nitrogen, total phosphorous, total suspended solids, and biological oxygen demand. *See* CX 1 at 11; CX 1.14 at 1; CX 8 at 12, 14; CX 8.13 at 10-12. Further, the record reflects the deleterious effects of such pollutants, both with regard to the water quality of the receiving water, in this case, the East Fork of the Des Moines River, and human health. As noted by Complainant, the presence of nitrogen (including ammoniacal nitrogen) and phosphorus are associated with eutrophication of surface waters, fish kills, and reduced biodiversity in waterways. *See* CX 22 at 39, 42; CX 23 at 15-16, 20. Additionally, the presence of E. coli poses serious risks to human health in a recreational water. Humans exposed to E. coli through

waterborne or recreational contact may contract colibacillosis, resulting in serious health consequences, including death. *See* CX 22 at 31; CX 23 at 17, 19; CX 24 at 25-26; Tr. 444. As a result, the presence of elevated levels of these pollutants in the process wastewater runoff to the East Fork of the Des Moines River reflects actual harm to this waterway.

The presence of elevated E. coli in the violative discharges in this matter is of particular concern when further considering evidence of impaired water quality in the East Fork of the Des Moines River due the presence of bacterial pollutants. Notably, a portion of the East Fork of the Des Moines River has been identified as a federally impaired waterway with bacteria levels precluding recreational use. *See* CX 26 at 7, 11-12; Tr. 440. In evaluating the impaired water quality of the East Fork of the Des Moines River, IDNR identified improperly constructed and maintained animal feeding operations as a contributing source of bacterial pollutants. *See* CX 26 at 22, 24. For purposes of improving the water quality of this impaired waterway, IDNR established a Total Maximum Daily Load ("TMDL") standard for E. coli of 126 units per 100 milliliters during the recreational season of March 15 to November 15 annually. *See* CX 26 at 8-9, 20, 24; Tr. 442. As observed by Mr. Draper, the levels of E. coli found in the samples of runoff taken from the Swale, both during the 2014 Inspection when the Manure Pit was observed to overflow, and during the 2016 Inspection, when the Manure Pit was not observed to overflow, contained E. coli levels significantly exceeding this established standard. *See* Tr. 442-43; *see also* CX 1 at 11; CX 1.14 at 1; CX 8 at 12, 14; CX 8.13 at 10-12 (reflecting water quality test results for these samples). Further, as reflected in Dr. Wang's analysis of the fate and transport of E. coli in the tile drainage system at the Riverview Facility, elevated levels of E.coli persisted while the process wastewater traversed through the tile drainage system and discharged to the East Fork of the Des Moines River. *See* CX 20.1 at 3-4.

Further, in considering the harm caused by the violations in this matter, as noted by Complainant, the frequency and duration of the violative discharges is significant. As discussed above, the record has established 41 days on which pollutants were discharged from the Riverview Facility, occuring over a period of several years. Although I considered Respondents' arguments with regard to the significant amount of rainfall received prior to the 2014 Inspection, as discussed above, I did not find this to be an anomalous event over the period of established violations. *See supra* at 85-86. Accordingly, I find that the nature, circumstances, extent, and gravity of the violations to be significant, and this is reflected in the assessed penalty amount.

b. <u>Respondents' Degree of Culpability</u>

"Civil penalties under the Clean Water Act are intended to punish *culpable* individuals and deter future violations, not just to extract compensation or restore the status quo." *Kelly v. EPA*, 203 F.3d 519, 523 (7th Cir. 2000) (emphasis added). Thus, this penalty factor serves to measure the level of a violator's culpability, which can be defined as fault or blameworthiness. *See Phoenix Constr. Servs. Inc.*, 11 E.A.D. at 418. In the present matter, the record reflects that Respondents acted negligently in committing the established violations of the CWA, and that assessment of a significant penalty is appropriate. However, the efforts taken by Respondents during the period of established violations to control the process wastewater runoff from the Riverview Facility, including the installation of the Manure Pit, warrant consideration. Although such measures were insufficient to control the process wastewater runoff and prevent the

discharges from the Riverview Facility to the East Fork of the Des Moines River, they support a downward adjustment to the assessed penalty in this matter.

The record does not reflect that Respondents acted willfully in violating the CWA as established in this matter. On the contrary, Respondent Tony Brown provided credible testimony indicating that Respondents never intended to violate the CWA, and expressed embarrassment with regard to the conditions observed during the 2014 Inspection in particular. *See* Tr. 979-81. Likewise, Ms. Benson testified that in her interactions with Respondent Tony Brown, he earnestly expressed his intent not to discharge pollutants from the Riverview Facility. *See* Tr. 1043-44. Notably, in his testimony, Mr. Draper acknowledged that he did not think Respondents were willfully using the tile drainage system to discharge pollutants from the Riverview Facility. *See* Tr. 459-460. Although Complainant asserts its position that Respondents could have been more forthcoming with regard to the location of the tile drain outlet during the 2014 Inspection, Complainant concedes that "Respondents were often cordial and cooperative with EPA inspectors." *See* Compl. I. Br. at 50. Further, the record does not support that Respondents tried to obstruct the 2014 Inspection, or subsequent enforcement activity initiated by Complainant.

Nevertheless, the record reflects that Respondents did not exercise a reasonable degree of care in their operations at the Riverview Facility during the period of established violations. Although Respondents have suggested that their culpability warrants a penalty of "only a minimal amount," *see* Resp. I. Br. at 34, I do not agree.[70] As individuals with significant experience in livestock farming and agricultural production, Respondents should have been aware of the CWA's prohibition on the unauthorized discharge of pollutants, and either taken measures to entirely preclude discharges of process wastewater runoff from the Riverview Facility to the East Fork of the Des Moines River, or obtained an NPDES permit for such discharges. *See* Tr. 787-94, 985-86, 988 (discussing Respondents' background in livestock farming and agricultural production). Further, the violations in this matter were not latent, and should have been evident to Respondents in their operation of the Riverview Facility, particularly over the significant duration of the established period of violations. Notably, this is consistent with testimony from Respondent Tony Brown, which indicated that Respondents were motivated to construct the Manure Pit upon realization of the amount of runoff generated from the Riverview Facility and the need to control such runoff. *See* Tr. 805-06, 831-32.

Unfortunately, as discussed above, the record reflects that the efforts taken by Respondents during the period of established violations to control process wastewater runoff from the Riverview Facility, including construction of the Manure Pit in or around September 2011, and manure removal and Manure Pit removal activities, were insufficient to contain process wastewater runoff at the Riverview Facility and prevent discharges to the East Fork of the Des Moines River. However, these measures to mitigate the flow of process wastewater runoff are not insignificant, and warrant reduction in Respondents' penalty for the associated violations. Although Complainant, in supporting the proposed penalty, acknowledged Respondents' construction of the Manure Pit, it does not appear that Complainant considered

[70] Notably, Respondents in their Reply Post-Hearing Brief go further, arguing that the penalty "should be eliminated entirely." Resp. Reply Br. at 15.

Respondents' mitigation efforts during the period of established violations in calculating the proposed penalty. *See* Compl. I. Br. at 50. Accordingly, while the record reflects that Respondents acted negligently with regard to controlling the process wastewater runoff at the Riverview Facility during the period of established violations, and such culpability warrants the imposition of a significant penalty, the record nevertheless provides support for reducing the penalty in consideration of Respondents' mitigation efforts during the period of established violations.

ii. Economic Benefit or Savings

Recovering the economic benefit that a violator received by not complying with environmental laws "is a critical component of the Agency's civil penalty program." *San Pedro Forklift*, 15 E.A.D. at 879 (citing *B.J. Carney Indus., Inc.*, 7 E.A.D. at 207). This is particularly true in enforcement matters like this one, where the CWA requires consideration of the "economic benefit or savings (if any) resulting from the violation." *San Pedro Forklift*, 15 E.A.D. at 879 (quoting 33 U.S.C. § 1319(g)(3)). Generally, economic benefit is calculated as a measure of "delayed costs," "avoided costs," and/or the "benefit from competitive advantage gained through noncompliance." *Id.* (quoting *Britton*, 8 E.A.D. at 287).

In this matter, however, the evidence presented by Complainant regarding economic benefit is inadequate to establish what, if any, economic benefit was received by Respondents for the established violations. Complainant presented evidence regarding the alleged economic benefit or savings received by Respondents for their violations through the testimony of Mr. Draper. *See* Tr. 435-39. Notably, however, Complainant did not submit Mr. Draper's actual calculations with regard to the alleged economic benefit or savings received by Respondents. In his testimony, Mr. Draper asserted that the industry standard for runoff control for a CAFO such as the Riverview Facility is a facultative lagoon, and he estimated that the initial cost of this runoff control method would be $50,000, with $5,000 annual maintenance and operations costs. Tr. 435-36. Mr. Draper stated that he arrived at this estimate by applying information regarding estimated costs for this construction and maintenance from the Iowa Beef Feedlot Systems Manual developed by the Iowa State University in CX 21, and multiplying these costs per head of cattle. *See* Tr. 435-36; *see also* CX 21 (the Iowa Beef Feedlot Systems Manual referenced by Mr. Draper). Even though he concluded that this initial figure was "conservative," Tr. 436, Mr. Draper further estimated the cost Respondents' expended in capping the tile drain inlet and constructing a culvert, as a method of preventing discharges through the tile drainage system at the Swale, *see* Tr. 436-38. Reportedly, based upon consideration of Bureau of Labor Statistics, which were not offered as evidence, to consider the cost of labor hours on such a project, and unknown sources for material estimates, Mr. Draper concluded that the cost for this method of preventing unauthorized discharges from the Riverview Facility would be $3,000. Tr. 437. Mr. Draper then reported that he applied this figure to EPA's economic benefit model to calculate the benefit derived from delayed costs over a period from 2011 into 2015, and arrived at a figure "just shy of $800." Tr. 437-38.

Mr. Draper's estimates regarding the economic benefit or savings received by Respondents as a result of the violative conduct are so problematic as to render them entirely unreliable. First, it is notable that although Complainant has acknowledged that the unauthorized

discharges from the Riverview Facility ceased when Respondents blocked the intake pipe of the tile drain inlet the day following the 2014 Inspection, *see* Compl. I. Br. at 2, 30 n.40, Mr. Draper did not provide any estimate with regard to the costs associated with this method of discontinuing the violative conduct. Additionally, with regard to Mr. Draper's calculations of estimated costs involved in capping the tile drain inlet and installing a culvert at the Riverview Facility, Complainant neither submitted Mr. Draper's actual calculations, nor the evidence he reportedly used to make his estimate regarding this cost. Likewise, Complainant did not provide Mr. Draper's calculations regarding the EPA's economic benefit model in estimating the benefits received by Respondents in the form of delayed costs for capping the tile drain inlet and installing a culvert, and Mr. Draper indicated in his testimony that he considered a duration of time for such calculations that is longer than both the period of alleged violations and the period of established violations in this matter. Finally, Mr. Draper's calculations with regard to delayed costs were so imprecise as to render Mr. Draper unable to identify a specific figure.

Given these significant issues with Mr. Draper's testimony regarding the economic benefit received by Respondents' violative conduct, I do not find that this evidence can be relied upon to determine the economic benefit or savings received by Respondents for their violative conduct. Notably, although Complainant argues that Respondents received an economic benefit from their violative conduct in its Initial Post-Hearing Brief, Complainant does not arrive at a specific figure for which it asserts is the actual economic benefit received by Respondents. *See* Compl. I. Br. at 48-49.

I also do not find that the record contains adequate information for me to compute any benefit received by Respondents for the violative conduct. *See e.g.*, *Wallin*, 10 E.A.D. 18, 28 (EAB 2001) (finding that the record did not contain an adequate basis for computing a respondent's economic benefit from violation where complainant did not consider the appropriate time period of violation, and the erroneous time frame underpinned complainant's economic benefit calculation). Although Complainant cites to information provided by Respondents regarding costs of improvements at the Riverview Facility following the period of established violations, as well as the amount paid to Ms. Heikens by Respondents to prepare an NPDES permit, *see* Compl. I. Br. at 49, such costs are not reflective of the method that Respondents used to discontinue the violative conduct in this matter, namely blocking the intake pipe at the tile drain inlet by placing a plastic tube around the intake pipe to sleeve it. *See* Tr. 855-65, 860, 963; CX 2 at 3. As a result, I find that the record does not contain sufficient information to establish the economic benefit or savings, if any, received by Respondents as a result of the violative conduct at issue in this proceeding.

iii. Respondents' Ability to Pay, Compliance History, and Such Other Matters as Justice May Require

I do not find Respondents' ability to pay, compliance history, or such other matters as justice may require warrant either increasing or decreasing the penalty for the violations in this matter. With regard to Respondents' ability to pay, it is notable that "a respondent's ability to pay may be presumed until it is put at issue by a respondent." *New Waterbury*, 5 E.A.D. 529, 541 (EAB 1994). In this matter, Respondents have not asserted a claim that they lack the ability

to pay a penalty. As a result, I do not find this factor warrants penalty adjustment in this proceeding.

Likewise, I do not find that Respondents' compliance history warrants either an increase or decrease to the penalty in this matter. Complainant acknowledges that it is unaware of any prior violations for Respondents, *see* Compl. I. Br. at 52, and the record does not reflect any history of violations. Respondents argue that this history, reflecting no prior violations, warrants a decrease in the penalty amount. *See* Resp. I. Br. at 35. Addressing this argument, Complainant suggests that Respondents, in operating the Riverview Facility, had limited contact with CWA enforcement entities, such as IDNR and EPA, during the period of established violations. *See* Compl. I. Br. at 52; Compl. Reply Br. 29. I agree with Complainant that Respondents' limited contact with CWA enforcement entities prior to the period of established violations in this matter undermines Respondents' position that their history of no prior violations warrants a reduction in penalty. Although Ms. Benson testified that IDNR was aware of the Riverview Facility prior to the 2014 Inspection, *see* Tr. 33-36, the record otherwise reflects that the Riverview Facility had not been inspected by IDNR prior to the 2014 Inspection, *see* Tr. 37-38; CX 1 at 6; CX 8 at 6. Likewise, the record does not reflect that the Riverview Facility had been inspected by the EPA prior to the 2014 Inspection, indicating that Respondents had limited contact with CWA enforcement entities prior to the period of established violations. Given this history, I do not find that Respondents' lack of prior violations warrants a decrease in the penalty in this matter.

Finally, I do not find applicable grounds for altering the penalty with consideration of other matters as justice may require. Although not expressly offered for consideration under this statutory factor, Respondents have asserted certain arguments that are most appropriately categorized as within the bounds of this factor for penalty consideration. For example, Respondents have argued that the conduct of inspectors during the 2014 Inspection has prejudiced Respondents, either through inspectors not collecting direct evidence from the outlet of the tile drainage system at the Riverview Facility during the 2014 Inspection, or through the relaxed demeanor of inspectors during the 2014 Inspection. *See* Resp. I. Br. at 1-2, 35-36. Additionally, Respondents indicate that their cooperation with Ms. Benson and IDNR evidence good faith actions warranting a reduction in penalty amount. *See* Resp. I. Br. at 35-36. I do not find that either of these arguments support a reduction in penalty in this matter. With regard to the conduct of inspectors during the 2014 Inspection, I do not find that the conduct of Mr. Urban or Mr. Roberts prejudiced Respondents or otherwise created circumstances warranting a reduction in penalty in this matter. Likewise, although Ms. Benson reported having repeated contact with Respondents on behalf of IDNR following the period of established violations in this matter, *see* Tr. 40-43, 1043-44, 1047-49, Ms. Benson indicated in her testimony that she did not speak to Respondents until following the 2014 Inspection, *see* Tr. 40, and the record does not otherwise reflect that Respondents had ongoing communication with IDNR during the period of established violations. As a result, while Respondents' contact with IDNR, and Ms. Benson more specifically, is supportive of efforts taken following the period of established violations to assure compliance with the CWA, these efforts are not indicative of compliance efforts during the period of established violations, and I do not find that they support reduction of the penalty in this matter. Accordingly, I neither increased nor decreased the penalty in consideration of Respondents' ability to pay, compliance history, or such other matters as justice may require.

c. Conclusion on Penalty

For the reasons described above, I find that it is appropriate to assess a penalty in the amount of $76,000 for the established violations of the CWA. As the record does not contain sufficient evidence to establish an economic benefit for the violations, as addressed above, this assessment does not include an economic benefit received for the established violations.

VII. ORDER

1. Respondents are liable for violating the Clean Water Act as set forth above.

2. For these violations, Respondents are hereby jointly and severally assessed a civil penalty of **$76,000**.

3. Payment of the full amount of this civil penalty shall be made within **30 days** after this Initial Decision becomes a final order under 40 C.F.R. § 22.27(c), as provided below:

   > Payment shall be made by submitting a certified or cashier's check[71] in the requisite amount, payable to "Treasurer, United States of America," and mailed to:
   >
   > U.S. Environmental Protection Agency
   > Fines and Penalties
   > Cincinnati Finance Center
   > P.O. Box 979077
   > St. Louis, MO 63197-9000
   >
   > A transmittal letter identifying the subject case and EPA docket number (CWA-07-2016-0053), as well as the Respondent's name and address, must accompany the check.
   >
   > If Respondents fail to pay the penalty within the prescribed statutory period after entry of this Initial Decision, interest on the penalty may be assessed. *See* 31 U.S.C. § 3717; 40 C.F.R. § 13.11.

4. Pursuant to 40 C.F.R. § 22.27(c), this Initial Decision shall become a final order **45 days** after its service upon the parties and without further proceedings unless: (1) a party moves to reopen the hearing within **20 days** after service of this Initial Decision, pursuant to 40 C.F.R. § 22.28(a); (2) an appeal to the Environmental Appeals Board is taken within **30 days** after this Initial Decision is served upon the parties pursuant to 40 C.F.R. § 22.30(a); or (3) the Environmental Appeals Board elects, upon its own initiative, to review this Initial Decision, under 40 C.F.R. § 22.30(b).

[71] Respondents may also pay by one of the electronic methods described at the following webpage: https://www.epa.gov/financial/additional-instructions-making-payments-epa.

SO ORDERED.

Christine Donelian Coughlin
Administrative Law Judge

Dated: October 15, 2020
Washington, D.C.

In the Matter of *Tony L. Brown and Joshua A. Brown, d/b/a Riverview Cattle*, Respondents.
Docket No. CWA-07-2016-0053

Certificate of Service

I hereby certify that copies of the foregoing **INITIAL DECISION AND ORDER**, dated and issued by Administrative Law Judge Christine Donelian Coughlin on October 15, 2020, were sent this day to the following parties in the manner indicated below.

Mary Angeles
Paralegal Specialist

Original and One Copy by Hand Delivery to:
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Dated: October 15, 2020
Washington, D.C.