12-2200-12820-2

STATE OF MINNESOTA
OFFICE OF ADMINISTRATIVE HEARINGS

FOR THE POLLUTION CONTROL AGENCY

In the Matter of the Dullea Co.
Feedlot Permit Application

FINDINGS OF FACT, CONCLUSIONS, AND RECOMMENDATION

The above-entitled matter came on for hearing before Administrative Law Judge Steve M. Mihalchick on February 7 and 8, 2001, at the Clay County Courthouse, Moorhead, Minnesota. The matter was then continued indefinitely pending a bankruptcy proceeding and appeal. Upon resolution of the bankruptcy appeal by a settlement, the matter was reactivated. Briefs and responses were then submitted, the last being received on April 15, 2002.

Robert B. Roche, Assistant Attorney General, 445 Minnesota Street, Suite 900, St. Paul, MN 55101-2130, appeared on behalf of the Pollution Control Agency (MPCA). Randolph E. Stefanson and Todd W. Foss, Stefanson, Plambeck & Foss, 403 Center Avenue, Suite 302, Moorhead, MN 56561-1287, appeared on behalf of the Applicant, Dullea Co.

NOTICE

This Report is a recommendation, **not** a final decision. The Pollution Control Agency will make the final decision after reviewing the record and may adopt, reject or modify these Findings of Fact, Conclusions, and Recommendations. Under Minn. Stat. § 14.61 and Minn. R. 7000.2000, the Agency's decision shall not be made until this Report has been available to the parties to the proceeding for at least ten days. Parties should refer to Minn. R. 7000.2000 or may contact Karen A. Studders, Commissioner, Minnesota Pollution Control Agency, 520 Lafayette Rd., St. Paul, MN 55155, telephone 651-296-7301, to ascertain the procedure for filing exceptions.

STATEMENT OF ISSUES

Would the feedlot for which Dullea Co. seeks a permit be a Concentrated Animal Feeding Operation (CAFO) under 40 C.F.R. 122.23? The Administrative Law Judge concludes that it would be a CAFO and thus an NPDES permit is required.

If the feedlot would not be a CAFO, would it meet the 25 mg/l BOD_5 effluent discharge limitation of Minn. R. 7050.0215? The Administrative Law Judge finds that it would not.

Should Dullea Co.'s application for a feedlot permit be denied because it cannot meet the discharge requirements for a CAFO or for a non-CAFO feedlot without

significant modifications to its facilities and procedures? The Administrative Law Judge concludes that the application must be denied.

Based upon all of the files, records and proceedings herein, the Administrative Law Judge makes the following:

FINDINGS OF FACT

1. Daniel F. Dullea is the head of two family farm corporations that own and operate a large farm in Clay County, Minnesota, near the City of Georgetown. Mr. Dullea's father purchased the original 2,300 acres of the farm in 1945 or 1946. There are now 3,850 tillable acres and about 4,000 acres in total.[1] The land and buildings are owned by Dullea Land Company, and the farm is operated by Dullea Co.[2] Mr. Dullea has been president of both corporations since about 1997, when he took over from his father. He and his wife, children, and other relatives own the corporations.

2. The vast majority of the farm is flat, tillable land used for raising grain. However, some variation is provided by the Buffalo River, the main branch of which enters Clay County from Becker County on the east and flows southwesterly, then northwesterly, across the county to Georgetown, where it enters the Red River.[3]

3. The Buffalo River meanders greatly. It approaches the farm from the south, then makes several sharp turns back and forth as it flows generally northerly along the western edge of the farm. Near the north end of Section 3 in Kragnes Township (T141N, R48W), the river turns from northerly to westerly for about 1500 feet. It then loops back to the right and flows easterly for almost the same distance, forming a peninsula about 400 feet wide.[4] The river in its normal channel is about 50 feet wide in that area.[5]

4. The elevation of the surface of the Buffalo River during a Department of Natural Resources (DNR) survey on July 12, 2000, was 867.7 feet above sea level.[6] That is approximately its normal level in its normal channel. According to the FEMA Floodway Map and Flood Profiles of the Buffalo River,[7] the stream bed elevation is 859.5 feet, the 10-year flood level is 880.2 feet, the 50-year flood level is 887.2 feet, the 100-year flood level is 889.1 feet, and the 500-year flood level is 892.2 feet, all at a point adjacent to the north side of the peninsula.

5. The Buffalo River has flooded to levels between 887 and 889 feet, at or near the 100-year flood level, three times in Mr. Dullea's memory: 1969, 1975, and 1997. The 1975 flood was the worst; the 1969 and 1997 floods were not as high.[8] The flood in the spring of 1997 was caused by the melting of the unusually high snow fall of that preceding winter.[9]

6. The Buffalo River flooded in the spring of 2000, rising to about 879 feet according to debris from that flood visible on a videotape of June 29, 2000,[10] and during the July 12, 2000, DNR survey.[11] There had been three four-inch rainfalls within the ten previous days.[12] The level reached was slightly short of the 10-year flood level of 880.5 feet.

7. The 25-year, 24-hour storm event is a statistic published by what was the United States Weather Bureau in Technical Paper 40. Roughly, it is the maximum 24-hour rainfall that could be expected to occur, on average, once in 25 years. More accurately, it is the amount of rain for which there is a one in 25 chance of occurrence in any year.[13] At the location of the Dullea Co. feedlot, the 25-year, 24-hour storm event is 4.1 inches.[14] This amount is used as benchmark. As used here, feedlot operators must either contain all feedlot runoff from rainfall up to that amount or, in certain cases, ensure that feedlot runoff from rainfalls up to and including that amount contain less than 25 mg/l of BOD_5.

8. All of the peninsula is on Dullea Land Company property. A gravel driveway runs down the center of the peninsula from the east, but does not extend to the westerly tip of the peninsula, which appears to be wooded or brush-covered for a few hundred feet. The six separate lots making up the feedlot are on the peninsula from near the center to its east end. On the east end base of the peninsula, and in the adjoining area just to the east of that, are several homes, grain bins, elevators, and other buildings and structures.[15]

9. Cattle and other farm animals were being raised on the peninsula when the Dulleas bought the property. The Dullea Co. continued that practice. It fed cattle, primarily feeder cattle, on the peninsula during the winters from 1946 until 1996, when the MPCA investigated a complaint about manure being discharged into the river. The Dullea Co. had operated the feedlot those 50 years without a feedlot permit and without any formal complaints before 1994. However, the feedlot had been discharging significant amounts of manure and manure-contaminated runoff into the Buffalo River for at least the last few years up to 1996. The Dullea Co. closed the feedlot in 1996 as a result of the investigation and demands by the MPCA.[16]

10. Prior to 1996, the Dullea Co. would ordinarily begin buying cattle in September, building up the herd of sometimes over 1,000 cattle through October, and sometimes into November. The cattle would be fed for approximately 200 days and then shipped for slaughter. Shipments would begin in March and continue through May, and occasionally into June. The lots would be cleaned out approximately once a month while being used, and completely cleaned by July of each year.[17]

11. The Dullea Co. had raised feeder cattle in the winter because it was efficient and productive to do so. Its family member employees were not busy with crops during that time and it could use the grain it had grown for feed. It also used the manure as fertilizer on its fields.[18] The Dullea Co. now seeks a permit to operate a feedlot on the peninsula again, but somewhat differently from the way it had been configured and operated previously.

12. The topography of the peninsula is shown on Ex. 12, an aerial photograph of the farm buildings,[19] and on Ex. 5, a topographic map drawn by the Waters Division of the DNR from the survey data obtained July 12, 2000.[20] However, the DNR topo map vaguely and often inaccurately describes five of the six small lots that are included in the proposed feedlot.[21] The topo map is unclear as to the boundaries of the lots and

mistakenly includes fenced and unfenced lower areas below the lots where the Dullea Co. does not now intend to allow cattle. The lots are accurately shown on Ex. 13, which is a copy of the DNR topo map annotated by Mr. Dullea to show lots 1-6.

13. The mistake of including the lower areas was made because, as MPCA staff had observed, in previous years the Dullea Co. had fed cattle in areas below some of the lots. The fences around two of those areas, below lot 4 and below a portion of lot 3, still exist. A fenced area below lot 6 is shown on a June 16, 1996, videotape, as are manure and cattle tracks below the fence down to the river. [22] That fence apparently no longer exists.[23] In its application filed October 28, 1996, the Dullea Co. included dimensions of the lots that correspond approximately to the lots shown on Ex. 13, except that it included the fenced pen below lot 4 and mistakenly described lot 3 as "50 x 100" when it was actually about 50 x 250.[24] The Dullea Co. withdrew the lower portion of lot 4 during the hearing.[25] In addition to the errors in the topo map, several of the descriptions given by MPCA witnesses during the hearing were based on the locations of the old lower pens, rather than the actual locations of the proposed lots. That caused some statements of fact to be made that are no longer correct. For example, it was claimed that the lots are adjacent to the river or within 20 feet of the river, but that is no longer the case. The findings in this report are based upon the lots as shown on Ex. 13.

14. Lots 1-5 are located on the south side of the peninsula, lot 6 is on the north side. Lot 1 is on the east end, where the river is coming up from the south and turning west. Generally, the lots, along with barns, sheds, and other buildings are located on the crest of the peninsula. Because the land slopes to the west, the edge of the crest is at about 885 feet above sea level along lots 1-3 and about 883 feet along most of lot 5, although part of it goes down to 880 feet.[26]

15. The elevation along the edge of lots 1 and 2 was increased by the addition of an earthen dike. Following a severe flood in 1969 that apparently reached the grain in the grain bins, the Dullea Co. constructed a dike around the grain bins, homes, shop, and other buildings on and near the east end of the peninsula. They used two scrapers to move the soil and a transit to measure elevations. After an even higher flood in 1975, they added to the dike.[27] An aerial video tape taken of the farm on April 16, 1997, during the third significant flood since 1969, shows that the dike did its job. The entire area was flooded except for the area inside the dike.[28]

16. The dike is, for the most part, 40 to 60 feet wide at its top and 100 feet wide at its base. Its top is at an elevation of 890 feet, almost a foot above the 100-year flood level. It was built along the edge of lots 1 and 2, then north to the driveway on the peninsula, across the peninsula, and then between the river and the houses and buildings to the north and east. Thus, lots 1 and 2 are within the dike and lots 3-6 and the barns, sheds, and other buildings adjoining them are not.[29] During the 1997 spring flood, water covered lots 3-6 and the bases of those structures.[30]

17. Land slope is expressed as a percentage representing the number of feet the land falls in 100 feet of horizontal distance.[31] Terms used to describe slopes are

defined in Table 3-1 of the Soil Survey Manual, 1993, Soil Conservation Service,[32] U.S. Department of Agriculture Handbook 18, as follows:

Table 3-1
Definitions of Slope Classes

Classes		Slope gradient limits	
Simple slopes	**Complex slopes**	**Lower**	**Upper**
		Percent	Percent
Nearly level	Nearly level	0	3
Gently sloping	Undulating	1	8
Strongly sloping	Rolling	4	16
Moderately steep	Hilly	10	30
Steep	Steep	20	60
Very steep	Very steep	>45	

The Manual allows the classes to be divided for more detail. For example, "strongly sloping" may be divided into "sloping, strongly sloping, and moderately sloping."[33] While the parties and witnesses often used biased terms to describe the slopes, this report attempts to use the more objective definitions in the Soil Survey Manual.

18. Lots 3-5 slope gently to the south from the driveway to the edge of the crest of the peninsula. Those lots are mostly 60 to 80 feet wide and fall from about 886 feet on the driveway side to 883 or 884 feet on the river side. That is a slope of 2.5 to 5.0 %—"gently sloping." The west portion of lot 5, south of a metal pole barn, is lower. It appears to fall from about 883 feet to 881 feet, but the DNR topo map has little data there. From the south edge of lots 3-5, the land falls fairly quickly from 883 or 884 feet to about 874 feet over a horizontal distance of about 40 feet. That is a slope of 22.5 to 25.0 %—"moderately steep." From there to the normal river channel, a distance of 40 to 60 feet at various points, the slope is more gradual, falling from about 874 feet to 869 or 870 feet at the edge of the channel. That is a slope of 6.7 to 12.5 %—"moderately sloping" to "strongly sloping." The overall slope from the front of lots 3-5 to the river bank is about 14 feet in 80-100 feet. That is 14.0 to 17.5%—"strongly sloping" to "moderately steep." The ground below lots 1 and 2 is similar—first "moderately steep" on the hillside and then "moderately sloping" along the lower ground to the river.[34]

19. Lots 1 and 2 behind the dike are different from the other lots. The ground there generally slopes away from the river and toward the northeast, particularly since the addition of the dike. In order to prevent rainwater and animal waste on lots 1 and 2 from running off toward "the yard" to the northeast, the Dullea Co. sculpted the ground and installed culverts in lots 1 and 2 to carry the runoff to the hillside on the river side.

20. Lot 1 is shaped to drain to a funnel-like depression in its interior that flows into an 18-inch concrete culvert that goes under the dike for about 50 feet and empties onto the hillside at a point were there is a slight natural channel in the hillside. That point is about 22 feet from the top of the dike, measured horizontally. The inlet is a few inches above the adjoining ground, so a small pool of liquid accumulates until it rises to the level of the inlet invert and starts draining out.[35] Based upon the DNR topo map, that pool might get as large as two by six feet. The inlet invert is at 883.74 feet and the outlet invert is at 883.11 feet,[36] a drop of 0.63 feet. A concrete spillway runs 15 or 20

feet from the end of the culvert toward the river. It had been put in 20 or more years earlier than the dike, perhaps to stop erosion.[37] Previously, liquids running off of lot 1 would have concentrated toward the natural channel there, so erosion was more likely. There is a hinged cap on the outlet end of the culvert to prevent floodwaters from flowing back up the culvert onto lot 1 and into the yard. Without this backflow preventer, water would flow part way up the culvert when the river reached about 884 feet and onto lot 1 and off to the yard when the river reached 885 feet.[38]

21. Lot 2 is sloped to a depression in its interior that drains into a 12 inch metal culvert that runs under the dike. It is about 40 feet long, thus extending about 14 beyond the edge of the lot 2. Its inlet invert is at 884.48 feet and its outlet invert is at 883.26 feet, a drop of 1.22 feet. It also empties onto the hillside at just below 884 feet. There was no evidence as to whether this culvert had a backflow preventer, but without one, water would flow up the culvert, onto lot 2, and into the yard whenever the river reached about 885 feet.[39]

22. Lot 6, on the north side of the peninsula, is nearly level at about 885 feet, but slopes slightly to the east and to its north edge. From the north edge, it falls 16 feet over a distance of 108 feet to the river's edge. That is a 14.8% slope—strongly sloping. Limited topographical evidence was presented, but the video tape recorded by MPCA staff on June 16, 1996, shows that some of the land below lot 6 was moderately sloped near the river and had had cattle on it.[40] Recent photographs show that some of the land there is nearly level.[41] A drain culvert was also installed in lot 6 that drains onto the slope. It was ordered closed by MPCA staff in 1996 and the Dullea Co. installed a concrete cap on its inlet end. The Dullea Co. has not plugged or removed the culverts in lots 1 and 2.

23. The Dullea Co. has covered much of lots 1-6 with concrete and installed concrete feed bunks. It has not installed any control structures to collect or retain any of the runoff from lots 1-6. Lots 3-6 slope toward the river and liquid animal wastes and rainwater can and do run off the edges of the lots and down the hillside toward the river. Lots 3-6 are mostly 100 feet or more from the river channel, but a small part of lot 2 is about 88 feet from the river and some of the lowest part of lot 5 is about 75 feet from the river. On lots 1 and 2, the dike prevents runoff over the edge toward the river, but the culverts redirect the runoff to two single points on the hillside, so all the runoff from the two lots still runs down the hillside and across the lower ground toward the river. The edges of lots 1 and 2, along the dike, are 100 feet or more from the river, the outlet of the culvert from lot 1 is 101 feet from the river, and the outlet of the culvert from lot 2 is 88 feet from the river.[42]

24. While the 40 to 60 foot strip along the river generally slopes moderately toward the river, some parts of it are level or almost level and a few small depressions exist. Two are shown on the DNR topo map at Survey Point 49 below lot 1 and Survey Point 130 on the fence line below lot 4. Both are within about 40 feet of the river and at an elevation of about 871 feet. The DNR topo map shows them to be very slight depressions, being less than a foot lower than the surrounding ground. Recent photos by Mr. Dullea show depressions in those two areas, some of which were still holding

some rainwater from a recent rain.[43] It is difficult to judge, but some of the depressions are somewhat more than a foot deep. Other photos indicate some depressions below lots 1 and 2 that are 12-18 inches deep. Those are located at the base of the "moderately steep" slope, at about the 875 foot elevation.[44]

25. MPCA Soil Scientist Mark Steuart is a feedlot specialist who was transferred to the Detroit Lakes MPCA office in 1996. He began investigating old and new feedlot complaints, including a two-year old one that the Dullea Co. feedlot was discharging manure into the Buffalo River.[45]

26. Mr. Steuart first inspected the Dullea Co. feedlot in May of 1996 with another MPCA employee. They found that some of the pens that had recently had cattle were within 20 feet of the river, depending upon its level, and located the three culverts used to drain lots 1, 2, and 6. He returned on June 16, 1996, with another employee, who videotaped the feedlot. At that time there were cattle only on lot 6.[46]

27. On June 16, 1996, lot 1 had no cattle and the manure had been mostly scraped off the surface. The cover on the outlet of the culvert used as a backflow preventer was propped open with a board. A trail, or plume, of manure, deposited from manure and manure-contaminated runoff that had flowed from the culvert, ran down the concrete spillway, continued down the hillside, and ran across the lower ground to the river bank. Mr. Steuart closed the cover and used the board to secure it in the closed position.

28. Mr. Steuart observed that lot 2 sloped to the culvert. The flow from that culvert had eroded a gully part way down the hillside and again left a trail of manure on the hillside and lower ground that extended to the river. He also concluded that rainwater from the roof of the elevator adjoining lot 2 would drain onto the lot and into the culvert. However, he was incorrect because the ground around the elevator slopes away from lot 2.[47]

29. The large barn between lots 3 and 4 has rain gutters and downspouts on the east side next to lot 3 and on the south side next to a part of the hillside that is not a part of any of the lots. The one on the east side empties on to lot 3, but the one on the south side goes into a tile system, not onto the ground. The two buildings on the west end of lot 5 have gutters and downspouts that may appear to drain onto lot 5, but they, too, run into a tile system. The Dullea Co. had also graded the road side of lots 3-6 with ditches so that most rain water from the building roofs and on the driveway will not flow onto the lots and over the manure. Rather, it is diverted away from or around the lots.[48]

30. On June 16, 1996, the fenced pen below lot 4 had manure in it from the cattle that had been fed there earlier that year. The video shows some level spots and slight depressions in the ground near the fence.

31. On June 16, 1996, lot 6 had cattle in it and was covered with manure one to two feet deep. The inlet of the culvert in lot 6 was below the manure; the outlet was

partially filled with manure solids, and a manure plume ran across the ground to the river. An area down by the river had a fenced cattle pen. There were substantial amounts of manure outside of the pen, between the fence and the river, with cattle tracks in it.[49]

32. On June 16, 1996, Mr. Steuart took a "grab sample" from the pool of liquid that was in the depression at the inlet to the culvert in lot 1.[50] Laboratory testing of that sample later showed it to be manure-contaminated. It contained:

Compound	**Sample Result**
Biochemical Oxygen Demand (BOD_5)	1700 mg/l
Nitrogen, Kjeldahl, Total	2200 mg/l
Phosphorus, Total	723 mg/l
Solids, Total Suspended (TSS)	325200 mg/l
Fecal Coliform	47000 FC/100 ml[51]

33. After the first visit, Mr. Steuart and Mr. Dullea apparently had a very confrontational discussion in which Mr. Steuart demanded that the culverts be plugged or removed. Soon thereafter, the Dullea Co. plugged the inlet to the culvert in lot 6 with concrete. That was the only lot with cattle in it at the time. The agency somehow later indicated that the feedlot could not be operated without a permit. The Dullea Co. closed the feedlot and had all the remaining cattle off the peninsula later that summer. At some point in 1996 or 1997, Mr. Dullea was arrested and charged with a felony in connection with operation of the feedlot. At that point, Mr. Dullea discussed with at least his own attorneys that the Dullea Co. would be willing to remove the culverts in lots 1 and 2 and also remove the dike, thus restoring the original topography. But the Dullea Co. has not done so and it is not known whether that proposal was communicated to the MPCA. Simply restoring the original topography while operating a feedlot would not have been a viable alternative. There has never been a working relationship between Mr. Dullea and Mr. Steuart. [52]

34. On October 28, 1996, the Dullea Co. filed an application for a feedlot permit.[53] MPCA responded that the application could not be processed or approved unless the Dullea Co. provided technical plans and specifications detailing how manure and manure-contaminated runoff would be prevented from entering the river. A slightly revised application was filed February 26 or 27, 1998. In connection with the criminal matter, Mr. Dullea had obtained a technical report from David A. Rein of Rein & Associates, Environmental Engineers. Dr. Rein's report was then used to support the permit application. In 1999, viewing the MPCA's inaction as a delay, the Dullea Co. brought a civil action alleging a taking and seeking an order compelling MPCA to act on the application. The Dullea Co. then agreed to dismiss the civil action without prejudice on condition that MPCA issue a determination.

35. On January 26, 2000, the MPCA published notice of its preliminary determination to deny the permit. A "Fact Sheet" describing the proposal and the MPCA's initial determinations was prepared by Mr. Steuart and issued as required by Minn. R. 7001.0100, subp. 3.[54] The Dullea Co. filed a timely petition for a contested

case hearing,[55] and this proceeding followed. In its petition, the Dullea Co. stated that it would be willing to reduce the number of feeder cattle below 1,000 and to discontinue the use of lot 4, if that would satisfy the MPCA.[56]

36. The "Fact Sheet" contained some obviously incorrect and biased statements of fact. For example, it claimed that lots 1 and 2 were "connected to the Buffalo River by two metal pipes that run from the interior of the lots out to the river."[57] That was not true and would only be true if the normal river surface elevation was over 884 feet. This statement was not qualified, as some others were, to state that the condition would exist during flood conditions.

37. The "Fact Sheet" stated that samples taken from the Dullea Co. feedlot indicated that "runoff from the facility exceeds established discharge limits" that would apply under state rules concerning effluent discharge limits. No runoff samples have ever been collected by the MPCA or anyone else. This statement was based upon the grab sample Mr. Steuart had collected from the small pool of water at the culvert inlet in lot 1 that contained 1700 mg/l of BOD_5 and from his professional experience that "any amount of manure" in a sample of this sort will cause it to exceed the 25 mg/l BOD_5 standard.[58] This is correct at an active feedlot's edge, but does not consider whether there is a sufficient vegetative buffer between the feedlot and the receiving water to absorb or filter the runoff before it reaches the water. Despite his overly-simplified statement during the hearing, Mr. Steuart was, no doubt, aware of that fact as well. At the time the Fact Sheet was prepared, the MPCA had no samples of runoff into the river. It only had Mr. Steuart's observations and specialized experience. He turned out to be correct.

38. The MPCA subsequently had three studies done for the hearing in this case: (1) An evaluation of the likely amount and BOD_5 concentration of runoff by Kim M. Brynildson, P.E., of the MPCA;[59] (2) an evaluation of runoff and potential pollution by Kenneth N. Brooks, Ph.D., Professor of Hydrology and Watershed Management, University of Minnesota, and Professional Hydrologist;[60] and (3) an assessment of potential impacts on the Buffalo River by David Maschwitz, Ph.D., Ms. Brynildson, and two others of the MPCA.[61] Ms. Brynildson and Dr. Brooks, along with the DNR surveyors who prepared the DNR topo map, all inspected the Dullea Co. feedlot on July 12, 2000. They did not talk with Mr. Dullea at that time, but did talk with Mr. Steuart who was also there. The Dullea Co. had Dr. Rein update his report for the hearing.[62]

39. Dr. Rein assessed the potential for pollution of the Buffalo River from the Dullea feedlot.[63] He did not make any runoff calculations for the Dullea Co. feedlot.[64] Rather, he based his estimates on averages reported in the literature. He determined that a rainfall of 0.5 inches would cause runoff from the feedlot.[65] Ms. Brynildson and Dr. Brooks confirmed that conclusion.[66] He estimated from historical data that there would be 8 days each year with more than 0.5 inches of rainfall.[67]

40. Dr. Rein calculated that the 1,000 feeder cattle would produce 63,300 lb/day of manure. Based on values from literature that manure is 15% solids, of which 80% are biodegradable, he calculated that 7,600 lb/day of biochemical oxygen demand

(BOD) would be produced. He then annualized that number to conclude that the average BOD produced in the manure of 1,000 feeder cattle was 6,200 lb/day.[68] In Dr. Rein's opinion, even if that 6,200 pounds of manure were dumped directly into the river, it would be dispersed by the river flow, increase the BOD concentration in the river by 11 mg/l, and would not be likely to lower the dissolved oxygen (DO), upon which aquatic life forms depend, below 2.[69] Using a national average that 2 to 5% of manure produced in a typical feedlot reaches the receiving water, Dr. Rein further estimated that if the Dullea Co. feedlot matched that figure, the increase in BOD concentration in the Buffalo River would only be 0.55 mg/l—so small as to most likely have no impact on the river.[70]

41. Dr. Rein provided no reliable information on the amount or concentration of pollutants that would be discharged by the Dullea Co. feedlot into the Buffalo River or the effect of those pollutants upon the river. The national average values he uses are vague, and there is no reason to apply them to the runoff from this particular feedlot. His testimony about the possible impacts on the Buffalo River is only based upon possible scenarios.

42. In Dr. Rein's opinion, it would be impractical for the Dullea Co. to install a wastewater treatment system sufficient to achieve and maintain the effluent standard of 25 mg/l of BOD_5, so that, in effect, the standard would require the Dullea Co. to contain all waste and runoff from all rainfall events up to the 25-year, 24-hour storm event.[71]

43. Ms. Brynildson was of the opinion, based upon her experience and observations of the Dullea Co. feedlot, that runoff from the feedlot would exceed the 25 mg/l BOD_5 standard. She ran the "Feedlot Evaluation Model" to demonstrate specifically how severe the discharge from the Dullea Co. feedlot would be.[72] The Feedlot Evaluation Model is a set of mathematical equations and data tables used to evaluate a set of inputs. It can be run on any of a number programmable scientific calculators. It was developed by two agricultural engineers from the USDA Agricultural Research Service at Morris, Minnesota, and a senior engineer at the MPCA. It is described fully in Ex. 10, an article entitled *An Evaluation System to Rate Feedlot Pollution Potential*, published by the USDA-ARS in 1982.

44. The Feedlot Evaluation Model was developed as a tool to evaluate and rate the pollution potential of feedlots in Minnesota and to help designers of feedlot improvements find the best methods for abating surface water pollution from any feedlot.[73] For any selected amount of rainfall, usually the 25-year, 24-hour storm event amount, the model calculates the volume of runoff that will reach the surface water and the concentration of chemical oxygen demand (COD) and phosphorus (P) in the runoff. COD is used because it is easier to calculate than BOD and can reliably be converted to BOD_5 for typical feedlots by dividing by a factor of about 4.5.[74] If the calculated COD level exceeds 112 mg/l (the 25 mg/l BOD_5 limit times about 4.5), the Feedlot Evaluation Model considers the feedlot to be a polluting feedlot and calculates the mass load (total amount, not concentration) of COD in pounds by multiplying the volume by the concentration. From that, it then calculates a rating value between zero and 100. Mass load calculations are not done for feedlots that don't exceed the 25 mg/l standard and

they are not given a rating. The ratings of the “polluting” feedlots can be used to compare their relative potential pollution hazard based upon the total amount of pollutants that would be discharged to surface waters of the state.[75]

45. The Feedlot Evaluation Model starts with an assumed feedlot with 100 beef cattle per acre where the manure is scraped or removed every 10 days. This results in a “100-percent manure pack,” which creates the maximum concentration of COD in rainfall runoff at the edge of the feedlot. In other words, even if more manure is added, the concentration of COD will not increase. Based on several studies in northern states and Canada, the authors selected a rounded value of 4,500 mg/l of COD in runoff for 100-percent manure pack feedlots.[76] Dividing by 4.5, a BOD_5 concentration of about 1,000 mg/l in runoff at the edge of such a feedlot would be typical. The BOD_5 concentration of 1,700 mg/l in the standing pool of water on lot 1 gathered by Mr. Steuart exceeds the maximum concentration of 1,000 mg/l, but that could be expected in a standing pool of water where there is continuous contact with manure and evaporation.

46. The Feedlot Evaluation Model accepts several inputs to tailor its calculations to the characteristics of the feedlot being evaluated. These include the size and type of surface of the lot and number and type of animals; the size of adjoining roof and ground areas that will drain onto the lot; the size, slope, soil, and ground cover of the buffer area between the lot and the discharge point; and the size of other adjacent areas from which clean water flows into the runoff from the lot.[77] The discharge point is the point where the runoff becomes channelized in its flow to the receiving water. Once the common phenomenon of channelization occurs, there is normally little filtration effect regardless of the vegetative cover.[78]

47. The Feedlot Evaluation Model article notes that several studies have shown that vegetative buffer areas are relatively effective means of reducing the concentration of potential pollutants from runoff waters.[79] It reports that for any buffer other than grass, a length of about 1,700 feet as sheet flow, meaning flow that is not channelized, will always be sufficient to reduce the COD concentration below 112 ppm.[80] It also says a shorter buffer might suffice if there are fewer animals per acre on the lot or if the buffer is heavily vegetated and relatively flat.[81]

48. The Feedlot Evaluation Model uses average values based upon research data and therefore can produce only estimates or indications of the quality of runoff at the feedlot edge and discharge point. It was designed that way because its main purpose is to provide a uniform basis for comparing the total amount of pollutants discharged by a feedlot to other feedlots throughout the state, not to provide the precise numerical concentration of pollutants.[82] Nonetheless, as demonstrated by the apparent reliability of the data and studies used by the developers, the knowledge and experience of the developers, and the strength of the logic and formulas they used, the Feedlot Evaluation Model will, if provided appropriate inputs by a trained and experience person, produce reasonably accurate approximations of COD concentration and volume of runoff from the feedlot to the receiving water for any amount of rainfall

examined, and then calculate a reasonably accurate approximation of the mass load of COD in that runoff.

49. Ms. Brynildson has been working as a feedlot engineer with the MPCA since 1984. She has used the Feedlot Evaluation Model about 100 times throughout that period, but only rarely to determine just BOD concentration in runoff.[83] She is "fairly confident" that the actual concentration in the runoff will be "fairly close" to what the model determines.[84]

50. In August 2000, Ms. Brynildson used the Feedlot Evaluation Model to evaluate the Dullea Co. feedlot. She evaluated each lot separately because they each have a separate discharge point to the Buffalo River. She developed the inputs from information in the application, Dr. Rein's report, discussion with Mr. Steuart, the topo map prepared by the DNR, and her own observations of the site on July 12, 2000. For lots 3-6, Ms. Brynildson assumed that the runoff flowed off the edges of the lots in a sheet flow that did not channelize before reaching the river. Thus, she considered the entire hillsides below those lots to be vegetative buffer. She concluded that the runoff running through the culverts in lots 1 and 2 would continue in a channelized flow to the river, and therefore not be buffered by vegetation. Thus, she set the buffer size to zero for those two lots.[85] The parameters Ms. Brynildson used were:

Lot #	Lot Size (acres)	# of Animals on Lot	% Paved	Buffer Area (acres)	Length of Buffer	Slope of Buffer	Ground Cover of Buffer
1	0.46	135	0	0	-	-	-
2	0.22	65	0	0	-	-	-
3	0.92	265	13.5	0.13	25	12.5	perm meadow
4	0.73	210	30	0.09	20	5	perm meadow
5	0.74	215	30	0.18	40	7.5	perm meadow
6	0.37	110	75	0.60	100	15	woodland[86]

51. Ms. Brynildson ran the model with different rainfall amount inputs from 0.25" to 4.1", which is the 25-year, 24-hour storm event amount in the area.[87] The model calculated there would be no runoff with a 0.25" rainfall, but that there would be with 0.5" and above.[88] The results for the 4.1" rainfall were:

Lot #	Volume (l)	COD (mg/l)	BOD_5 (mg/l)	BOD_5 mass (mg)
1	152,100	4500.00	990	150,620,000
2	73,000	4500.00	990	72,260,000
3	323,800	2797.46	615	199,150,000
4	263,200	2637.30	580	152,640,000
5	280,600	2138.87	471	132,180,000
6	236,400	1426.53	314	74,240,000
Total	1,329,100			781,090,000

Dividing the total BOD_5 mass by the total volume yields a weighted average concentration of BOD_5 from the entire site of 587.7 mg/l.[89]

52. Ms. Brynildson estimated the number of animals on each lot by prorating the total of 1,000 in the application among the lots by lot size.[90] Mr. Dullea testified that the actual distribution would be different, based on lot size and bunk capacity. Lot 1 would have up to about 300 cattle; lots 3 and 4, up to 100 each; and lots 5 and 6, up to 200 each. Lot 2 would only be used as necessary to separate sick cattle.[91] Mr. Dullea also testified that it is the Dullea Co.'s practice to allow the manure to accumulate during the winter to provide a "bedding heat pack," and then, after it warmed up in the spring, scrape the manure out at least once a month.[92] These number differences are not significant for the model in this case. The animal numbers are used to calculate the amount of manure produced. One hundred beef animals per acre produce a 100% manure pack when the lot is scraped every ten days.[93] Adding more manure to a 100% manure pack does not increase the concentration of pollution in the runoff, and this fact is reflected in the Feedlot Evaluation Model calculations.[94] Both Ms. Brynildson's and Mr. Dullea's numbers far exceed the number of animals necessary to create a 100% manure pack, so the model inputs for animal numbers were appropriate.

53. There are a few errors in the lot and buffer size inputs used by Ms. Brynildson. For lots 3 and 4, she incorrectly considered the lower fenced areas to be part of the lots, so apparently measured from the river bank to the respective fences to decide that the lengths of the buffers were 25 and 20 feet, respectively. They should have been 100 and 106 feet.[95] The same error caused the lot sizes to be significantly overstated and the buffer sizes to be significantly understated. Lot 3 as measured on Ex. 13 is actually about 0.23 acre, not 0.92 acre, and its buffer area is 0.57 acre, not 0.13 acre. Lot 4 is 0.37 acres, not 0.73, and its buffer is 0.49 acre, not 0.09. Lot 5 has an average buffer length of about 90 feet, not the 40 feet used by Ms. Brynildson. Its area is 0.38 acre, not 0.92 acre, and its buffer is 0.62 acre, not 0.18 acre. The reason for Ms. Brynildson's erroneous measurements of lot 5 is unknown. As for lots 1, 2, and 6, Ms. Brynildson's input are reasonably accurate. The foregoing corrections reduce the total area of the lots from 3.44 to 2.03 acres. The buffer area would be increased by the corresponding amount, so that the total area of the watershed for each lot would remain the same.

54. Each of the buffer areas for lots 3-5 should have been divided into two buffer areas to more precisely calculate the treatment difference between the moderately steep hillside and the moderately sloping lower ground. The runoff would quickly run down the hillside with very little treatment, but would cross the lower ground more slowly and receive more treatment. Splitting the buffer might also be appropriate for lot 6, but no data is available on the topo map. No buffers are necessary on lots 1 or 2, because the flow from the culverts, as had been observed in 1996, will remain channelized to the river even across the lower ground. There may be some temporary storage in depressions in the lower ground, but it would be inconsequential.

55. Ms. Brynildson testified she did not put in any inputs for clean water entering the lots from adjacent areas, but that the lack of clean water diversions to prevent yard and roof runoff from flowing across the lots would increase the pollution potential rating because there would be a much greater volume of runoff from the sites.[96] This statement, while accurate, is a bit misleading. The purpose of the model run was primarily to show the BOD_5 concentration, not the runoff volume or mass load of BOD. Clean water entering a lot from a tributary adjoining area could, depending upon its volume, tend to mix with the rain falling on the lot itself and, at most, reach the same concentration as the rain on the lot. If the volume of tributary water were high, it would tend to channelize through the manure pack and not pick up as much pollution. It would then dilute the runoff from the rain directly on the lot. So, the BOD_5 concentration in the runoff at the edge of the feedlot would never increase and it might go down. The model makes this adjustment.[97] In any event, while the Dullea Co. has not built concrete curbs of the type often used at feedlots for water diversion, it ditched the driveway and directed some rain gutter downspouts into drain tiles to reduce the flow of rain onto the lots from adjacent areas. Therefore, it turned out to be appropriate not to have any inputs for adjoining area contribution.

56. The results for COD concentration produced by the Feedlot Evaluation Model for lots 3-5 are not reliable because of the input errors. The results for lot 1, 2, and 6 roughly indicate the volume of runoff from those lots and the concentration of COD in that runoff, from which the approximate level of BOD_5 in the runoff can be calculated. Moreover, because lot 6 is quite similar in size and slope to lots 3-5, the inputs for lot 6 are close enough to the proper inputs for lots 3-5 so that the lot 6 results can roughly be applied to lots 3-5. However, some adjustment is necessary for the difference in ground cover.[98] Applying the lot 6 results to lots 3-5, and reducing the results for all lots by 25 percent for a wide margin of error because of the adjustments and failure to divide the buffer areas, it is reasonably certain that the 25-year, 24-hour storm event runoff from lots 1 and 2 will each contain at least 740 mg/l of BOD_5 and the runoff from lots 3-6 will each contain at least 235 mg/l. That creates an unweighted average concentration for the entire feedlot of at least 400 mg/l— at least 16 times the 25 mg/l limit. If the runoff from lots 1 and 2 was contained and not allowed to reach the river, some runoff from lots 3-6 would still reach the river and the combined average BOD_5 in it would be at least 235 mg/l, still nine times the limit.

57. These adjusted model results are consistent with the information available on vegetative buffers and Ms. Brynildson's experience.[99] A buffer length of 100 feet is just too short to provide much treatment, particularly when part of the buffer is moderately steep. It is not sufficient to reduce the concentration of BOD_5 in runoff from a solid manure pack to below 25 mg/l.

58. The runoff volume results from Ms. Brynildson's runs of the model, as opposed to the COD concentration results, are generally accurate because they are not significantly affected by the feedlot size errors. Runoff is from the lots and buffer areas (and other adjoining areas). The total area was correct in the model inputs.

59. Dr. Brooks performed an analysis of the runoff potential from the Dullea Co. feedlot. He, too, adopted the descriptions of the lots on the DNR topo map and the Fact Sheet that incorrectly included the hillside and lower ground below lots 2-5. For example, at page 2 of his report, Dr. Brooks makes the following observation:

> (2) High water marks were evident from a flood event that occurred on 21 June 2000. A dike was present I lots 1 and 2, but did not extend into lots 3,4 and 5. There was evidence that the flood waters from the 21 June flood inundated large portions of lots 3, 4 and 5 (see survey map of 7/12/00 by the Minnesota DNR Division of Waters). The recurrence interval of this flood was not known at the time of the site visit, but after the survey was completed, the elevation of the high water mark corresponded to between 879 – 880 as per the debris line. The 10-year recurrence interval flood in this reach of river corresponds to 880.2 ft (based on Federal Flood Insurance studies as provided by Jeff Lewis in a phone discussion on 31 Aug., 2000). Therefore, there is greater than a 10% chance of having a flood of this height or greater in any given year. Over a period of 10 years, there is over a 65% chance of a flood of this height or greater occurring at the Dullea feedlot site. Over a 25 year period there is a 93% chance of a flood of this magnitude or greater. Therefore, the feedlots 3, 4 and 5 are vulnerable to frequent inundation by flood waters.[100]

Even during the hearing, Dr. Brooks continued to describe lot 3 and 4 as including the lower fenced areas and being very near or on the river's edge.[101] He testified that he was not certain where cattle were confined on lots 3, 4, and 5, and that because he was not sure of where the bottom portion of the lots were, he did his slope calculations looking at general conditions from the top of the hill down to the water.[102] Since all of lots 3, 4, and 5 as applied for are above 880 feet, Dr. Brooks' starting premise was in error and his conclusion that the lots are "vulnerable to frequent inundation" is a substantial overstatement of the facts.

60. Dr. Brooks performed several calculations of runoff from the lots for several rainfall amounts. He used the Soil Conservation Service Runoff Curve Number (CN) method to do so.[103] The Curve Number method is commonly used to estimate the amount of precipitation falling on a certain soil type that will infiltrate into soil and the amount that will become runoff. The SCS developed a table of numbers for various soils based upon land use and drainage characteristics. An impenetrable surface would have a CN of 100, meaning all of the rainfall would run off. The more absorbent the soil type, the lower the CN number.[104]

61. For high CNs and high rainfall amounts, the percentage of rainfall that will run off is close to the CN. The equation for calculating runoff is $Q = (P - 0.2\ S)^2 / (P + 0.8\ S)$, where Q is runoff, P is precipitation amount, and S is a value calculated from CN using the formula $S = (1000/CN) – 10$.[105] Applying the formula to CNs from 100 down to 86, the runoff in inches and percent of precipitation for 4.2, 4.1, and 0.5 inches of

precipitation, as calculated on a spreadsheet by the Administrative Law Judge, are as follows:

CN	S	Runoff if P equals 4.2		Runoff if P equals 4.1		Runoff if P equals 0.5	
100	0	4.20	100%	4.10	100%	0.50	100%
99	0.10101	4.08	97%	3.98	97%	0.40	79%
98	0.204082	3.96	94%	3.86	94%	0.32	64%
97	0.309278	3.85	92%	3.75	91%	0.26	51%
96	0.416667	3.74	89%	3.64	89%	0.21	42%
95	0.526316	3.63	86%	3.53	86%	0.17	34%
94	0.638298	3.52	84%	3.42	83%	0.14	27%
93	0.752688	3.41	81%	3.32	81%	0.11	22%
92	0.869565	3.31	79%	3.21	78%	0.09	18%
91	0.989011	3.21	76%	3.11	76%	0.07	14%
90	1.111111	3.11	74%	3.01	74%	0.06	11%
89	1.235955	3.01	72%	2.92	71%	0.04	9%
88	1.363636	2.92	69%	2.82	69%	0.03	6%
87	1.494253	2.82	67%	2.73	67%	0.02	5%
86	1.627907	2.73	65%	2.64	64%	0.02	3%

62. The Feedlot Evaluation Model also uses the SCS Curve Number method to estimate the runoff, not just from the feedlot, but also from the adjacent and buffer areas.[106] Exhibit 10, the article on the Feedlot Evaluation Model, shows the CN numbers, also called “soil cover complex numbers,” in Table 4 on page 23. The Feedlot Evaluation Model does not use the SCS CN numbers for the feedlot itself. Instead it assigns a value from 91 to 94 based on the percentage of the feedlot that is paved. Those values were determined from previous research results.[107]

63. Dr. Brooks calculated the amount of runoff from each of the six lots for four levels of rainfall: 1.2 inches of rain, an amount that is likely to occur at least once each year in the months the feedlot would be in operation; 1.45 inches, the maximum recently measured in October or May; the 5-year, 24-hour recurrence interval event of 3.1 inches; and the 25-year, 24-hour storm event, which he determined to be 4.2 inches.[108]

64. Dr. Brooks used the same numbers as Ms. Brynildson for the sizes of the lots. He considered each lot to be a combination of concrete (CN = 98), poor pasture on soil group C (CN = 86), and poor pasture on soil group D (CN = 89). He weighted those CNs in proportion to the area in each category.[109] The following table shows Dr. Brooks’ area and CN inputs and his calculations for the amount of precipitation necessary to cause one-tenth of an inch of runoff and the amount of runoff from a 4.2 inches over 24 hours rainfall event.[110] The sixth column multiplies column two by

column five to show the runoff volume in acre-inches. The seventh column restates the volumes calculated by Ms. Brynildson with the Feedlot Evaluation Model.[111]

Lot #	Area (acres)	CN	Precip. Needed to cause 0.1" runoff	Q (4.2" P: 25-yr RI)	Brooks Runoff Volume (ac-in)	Brynildson Discharge Volume (ac-in)
1	0.46	86	0.50"	2.7"	1.24	1.48
2	0.22	98	0.15"	3.9"	0.86	0.71
3	0.92	97	0.20"	3.8"	3.50	3.15
4	0.73	90	0.45"	3.1"	2.26	2.56
5	0.74	90	0.45"	3.1"	2.29	2.73
6	0.37	95	0.25"	3.6"	1.33	2.3

65. Dr. Brooks' calculations are roughly consistent with Ms. Brynildson's volume of discharge calculations. Dr. Brooks was of the opinion that all of the runoff from the lots would reach the river, mostly because he included most of the hillside and lower area as part of the lots. Dr. Brooks used an unusually low CN number for lot 1 to show that even then there would be substantial runoff. He used the CN number for concrete for lot 2, for unknown reasons. Without some adjustment, the runoff volume numbers produced by Dr. Brooks are not accurate enough to be relied upon here. They do, however, provide support for the Feedlot Evaluation Model volumes. Dr. Brooks provides no evidence as to the pollution content of the runoff other than to say that the runoff would transport significant amounts of manure particles from the feedlot to the river.[112]

66. David Maschwitz, Ph.D., along with Ms. Brynildson, Ronald Jacobson, a Senior Engineer, and Gerald Blaha, a Research Scientist, all of the MPCA, prepared a report entitled Assessment of Potential Impacts of the Dullea Co. Feedlot on the Buffalo River, dated January 23, 2001 (Maschwitz Report).[113] Such analysis is rare, particularly since 1972. At that time, the Clean Water Act was amended to change the approach used in cleaning up the nation's waters from demonstrating that a polluter was causing downstream water quality violations to a program of permits and technology-based effluent limits.[114]

67. The Maschwitz Report relies heavily upon assessment and modeling tools because of the lack of opportunity to obtain actual data on runoff specific to the Dullea Co. feedlot. Despite some factual errors, again based upon the feedlot operation in the past rather than the current application, the report accurately describes the feedlot, the Buffalo River, rainfall in the area, and the pollution from the feedlot likely to result from rainfall, snow, and flooding.

68. The Maschwitz Report relies upon Ms. Brynildson's runs of the Feedlot Evaluation Model for runoff volumes and BOD_5 concentrations. These values are used along with river flow and upstream river pollution to predict the in-stream concentration of BOD_5.[115] As found above in Finding 56, the BOD_5 concentration from a 4.1 inch rainfall is at least 400 mg/l, not the 588 mg/l figure used by the Maschwitz Report.

Similar adjustments should be made to all the values in the mass balance calculator in Tables 15 and 16 of the Maschwitz Report. These adjustments would somewhat reduce the predicted BOD_5 concentrations in the river, but not eliminate them. The adjustments would not affect the findings in the Maschwitz Report.

69. The Maschwitz Report credibly finds a very high probability that runoff from the feedlot would cause severe harm to the chemical, physical, and biological integrity of the Buffalo River and concludes that the feedlot is a pollution hazard to the Buffalo River.

Based upon the foregoing Findings of Fact, the Administrative Law Judge makes the following:

CONCLUSIONS

1. The Administrative Law Judge and the MPCA have jurisdiction to consider this matter under Minn. Stat. §§ 14.50 and 116.07 and Minn. R. 7000.1750 to 7000.2200 and 7001.0130 to 7001.0140.

2. The Dullea Co. received due, proper and timely notice of the time and place of the hearing. This matter is, therefore, properly before the MPCA and the Administrative Law Judge.

3. As an applicant for a permit, the Dullea Co. has the burden of demonstrating that it meets the requirements for a permit and of proving any facts at issue by a preponderance of the evidence.[116]

4. Minn. Stat. § 116.07, subd. 7c(a) provides, in relevant part, as follows:

> The agency must issue National Pollutant Discharge Elimination System permits for feedlots with 1,000 animal units or more and that meet the definition of a "concentrated animal feeding operation" in Code of Federal Regulations, title 40, section 122.23, . . .

This statute is vague and requires interpretation. It may be read to mean that an NPDES permit is required where a particular feedlot has 1,000 or more animal units and also meets the definition of a CAFO, in other words, that any feedlot with less than 1,000 is not a CAFO. The statute may also be read to mean that NPDES permits are required for feedlots with 1,000 or more animal units and for feedlots that meet the definition of a CAFO. The second interpretation creates a very large redundancy because the definition of a CAFO already includes any feedlot with more than 1,000 feeder cattle.[117] Nonetheless, the second interpretation is the more correct interpretation because it is more consistent with the history and purpose of the statute.

The second clause, "and that meet the definition of a 'concentrated animal feeding operation' in Code of Federal Regulations, title 40, section 122.23," was added to the statute by Minn. Laws 2000, ch. 435, § 5.[118] Chapter 435 amended several provisions in the statutes regarding feedlots and manure handling.[119] Since Minnesota

participates in the NPDES process under a delegation from the U.S. Environmental Protection Agency, Minnesota must ensure that any feedlot required by federal law to obtain an NPDES permit is also required to do so under state law.[120] It is most likely that the amendment was intended to assure that this requirement was met.[121] If the amended statute were read not to require NPDES permits for CAFOs with less than 1,000 animal units, the state would not meet federal requirements, contrary to very clear legislative intent. Thus, despite the imprecise draftsmanship, Minn. Stat. § 116.07, subd. 7c(a), means that an NPDES permit is required for feedlots that meet the definition of a CAFO under the cited federal regulation or that have 1,000 animal units or more.

This interpretation has been adopted by the MPCA in Minn. R. 7020.2003, which states, in relevant part:

> An owner of an animal feedlot that is a CAFO or is capable of holding 1,000 animal units or more, or a manure storage area capable of holding the manure produced by 1,000 animal units or more, shall comply with the effluent limitation requirements of Code of Federal Regulations, title 40, part 412.

Contrary to assertions by the Dullea Co., this rule is not inconsistent with Minn. Stat. § 116.07, subd. 7c(a). It implements the proper interpretation of the statute and is binding in this matter.

5. Under Minnesota law, CAFOs must comply with the effluent limitations set forth in federal regulations.[122] Under federal regulations, CAFOs must be designed, constructed, and operated to contain all waste, plus the runoff from a 25-year, 24-hour storm event for the site.[123] In other words, there can be no discharge of pollutants, including precipitation runoff, except when precipitation is greater than the amount of such a storm event at the site.

6. 40 C.F.R. § 122.23 sets forth regulations applicable to state NPDES programs. 40 C.F.R. § 122.23(a) makes CAFOs "point sources" by definition and, as such, subject to the NPDES permit program. If the Dullea Co. feedlot is a CAFO and thus required to obtain an NPDES permit, it could not do so because, as designed, there will be precipitation runoff of some amount whenever there is a 25-year, 24-hour storm event, as well when there are lesser precipitation amounts.

7. As applicable here, 40 C.F.R. § 122.23(b) first defines an "animal feeding operation" and then a "concentrated animal feeding operation." An "animal feeding operation" is a lot where animals are confined and fed for 45 or more days per year and where crops or vegetation forage growth do not grow. Adjoining animal feeding operations under common ownership are considered to be one animal feeding operation.

8. Under the Dullea Co. application, cattle would be confined and fed on lots 1-6 more than 45 days per year. The ground in lots 1-6 is partially concrete-covered

and partially barren ground packed hard by the cattle; nothing grows within the lots. Thus, the proposed feedlot is an "animal feeding operation."

9. Under 40 C.F.R. § 122.23(b)(3) a "concentrated animal feeding operation," or CAFO, is an "animal feeding operation" the meets the criteria in Appendix B of the regulation or that is designated as such on a case-by-case basis under § 122.23(b)(3).

10. As far as is applicable here, Appendix B to 40 C.F.R. Part 122 first states that an animal feeding operation is a CAFO if more than 1,000 slaughter and feeder cattle[124] are confined, regardless of any other condition. That prong of the Appendix B criteria does not fit because there would be 300 to 999 feeder cattle in the Dullea Co. feedlot.

11. The second prong of Appendix B states that an animal feeding operation is a CAFO if more than 300 slaughter or feeder cattle are confined and either of two situations exist: (1) Pollutants are discharged into navigable waters[125] through a manmade ditch, flushing system or other similar device; or (2) pollutants are discharged directly[126] into waters that pass over, across, or through the facility. Appendix B does not refer to discharge of pollutants by any other method. Appendix B states that no animal feeding operation is a CAFO if it discharges only in the event of a 25 year, 24-hour storm event.[127]

12. If any of the culverts are open and there are cattle in the corresponding lots, the Dullea Co. feedlot is a CAFO as defined by Appendix B of 40 C.F.R. Part 122 because there will be a discharge of pollutants through the culverts, across the ground, and to the river. The culverts are manmade devices for transporting waste similar to a ditch, as is the concrete spillway below the lot 1 culvert outlet. The manure deposits left on the ground from the outlets of the culverts to the river channel in 1996 demonstrate that manure-contaminated runoff flowed through the culverts, across the ground, and then into the Buffalo River. There is no evidence that the discharges in 1996 were caused only by one or more 25 year, 24-hour storm events and that is highly unlikely. Ms. Brynildson's calculations for storm events less severe and more frequent than a 25-year, 24-hour event demonstrate that at least some of the manure-contaminated rainfall runoff from lots 1 and 2 from such events, all of which will flow through the two culverts to the slopes, will not be absorbed or retained on the slopes and will flow to the river. The language of Appendix B does not require that the discharge be directly from the culverts to the river, it need only pass through the culverts.[128]

13. Even if the culverts are plugged or removed from any lot in which cattle would be fed, the Dullea Co. feedlot would still be a CAFO as defined by Appendix B of 40 C.F.R. Part 122. There would be no discharge through a manmade ditch, flushing system, or other similar device, but the river would pass over, across, and through all or parts of lots 3-6 during a 100-year flood.

There is no direct correlation between a precipitation event and flooding of the river, so it is difficult to apply the storm event standard to the second prong of the

Appendix B test. It all depends upon conditions existing at the time of the rain. A 25 year, 24-hour storm event in the area is 4.1 inches in a day. If the ground has been dry for several days, that will likely only cause the river to rise to the top of its channel at about 869 feet. If it happens four times in a week, it can cause the river to rise to almost 880 feet, as it did in the spring of 2000. If it happens during spring snow melt, it could rise above the 885 feet level the snow melt itself caused. The lots are all above 880 feet and mostly above 885 feet. The 10-year flood level is 880.2 feet. Flooding of the lots is possible when a 25-year, 24-hour storm event is combined with other heavy precipitation events or other unusual conditions. The question is whether the Appendix B requirement for "waters that pass over, across, or through the facility" is met by such conditions occurring once every ten years on average, or, otherwise stated, with a ten percent likelihood of occurring in a given year. Like the storm event exception for unusually high rainfall, there must be some reasonable exception for unusually high flood levels. The language of the regulation is not clear on this point, and the parties argue that it favors their own position. No case interpreting Appendix B in this regard has been cited.

Minn. Stat. § 116.07, subd. 7(b), provides guidance for applying flood levels to the discharge of pollutants. It states that for state feedlot permit purposes, a discharge caused by an extraordinary natural event such as a precipitation event of greater magnitude than the 25-year, 24-hour event, tornado, or flood in excess of the 100-year flood is not a direct discharge of pollutants. Thus, direct discharges in the event of such very high floods are excused. But the statute must also be read to say that a direct discharge is not excused if it occurs at the 100-year flood level or less. At the 100-year flood level at the site of 889.1 feet, flooding of the feedlot is a certainty. In fact, much of the farm outside the dike would be flooded.[129] Anywhere above 880 feet, part of lot 5 would be covered. If the river rose to 887 feet or more, the river would cover all of lots 3-6, as it did in 1969, 1975, and 1997. Therefore, whether or not the culverts are plugged or removed, the feedlot is a CAFO under Appendix B.

14. 40 C.F.R. § 122.23(c)(1) permits the "Director," which means the MPCA in this case,[130] to designate any animal feeding operation as a CAFO if it is a significant contributor of pollution to the waters of the United States considering such things as the size of the operation, amount of wastes reaching the waters, proximity of the operation to the waters, the means of conveyance of the wastes to the waters, factors affecting the likelihood or frequency of discharge of animal wastes into waters, and other relevant factors. The designation shall not be made until the "Director" has conducted an on-site inspection of the operation and determined that the operation should and could be regulated under the NPDES permit program.[131]

15. MPCA staff has made on-site inspections of the Dullea Co. feedlot and determined that the operation should and could be regulated under the NPDES program. Despite some factual errors, the Maschwitz Report credibly finds a very high probability that runoff from the feedlot would cause severe harm to the chemical, physical, and biological integrity of the Buffalo River and concludes that the feedlot is a pollution hazard to the Buffalo River. This and other similar evidence in this case demonstrates that the Dullea Co. feedlot would be a significant contributor of pollution to

the Buffalo River. Therefore, it is also appropriate in this proceeding to designate the feedlot as a CAFO under the case-by-case determination criteria of 40 C.F.R. § 122.23(c).

16. As a CAFO, the Dullea Co. feedlot would be required to obtain an NPDES permit. However, the feedlot as designed cannot meet the NPDES permit requirement of containing all of its waste and runoff for all rainfall events up to and including the 25-year, 24-hour storm event. Therefore, an NPDES permit cannot be issued for the Dullea Co. feedlot.

17. If the feedlot were not a CAFO and therefore did not require an NPDES permit, it would still require a state permit.[132] Feedlots in Minnesota that are not regulated as CAFOs may discharge pollutants to surface waters of the state, but the discharge cannot have a five-day biochemical oxygen demand level in excess of 25 milligrams per liter.[133]

18. As proposed, the Dullea Co. feedlot will discharge pollutants into the Buffalo River during rainfall events equal to or less than the 25-year, 24-hour storm event at the site and that discharge will have a BOD_5 concentration in excess of 25 mg/l. Thus, the feedlot will violate Minn. R. 7050.0215, subp. 2. Therefore, no state permit may be issued for the feedlot.

19. The application of the Dullea Co. for a feedlot permit must be denied because the feedlot as proposed cannot meet the pollutant discharge requirements for either a CAFO or for a non-CAFO feedlot.

Based upon the foregoing Conclusions, the Administrative Law Judge makes the following:

RECOMMENDATION

IT IS HEREBY RECOMMENDED: that the Commissioner of the Pollution Control Agency deny the Dullea Co.'s application for a feedlot permit.

Dated December 2, 2002.

Steve M. Mihalchick
Administrative Law Judge

Reported: CATS Reporting Service (two volumes)

NOTICE

Under Minn. Stat. § 14.62, subd. 1, the agency is required to serve its final decision upon each party and the Administrative Law Judge by first class mail or as otherwise provided by law.

[1] Ex. 37; Transcript (T.) 284-286.
[2] In August, 2002, Dullea Land Company gave Ideal Ag Corporation a quit claim deed to its property in Clay County. Ex. 37. This was given as a financing device to secure an operating loan from Ideal Ag to Dullea Co. Ex. 38. Such use of quit claim deeds is not uncommon. *See, Evans v. Slage,* 197 Minn. 310, 267 NW 220 (1936); *Redmond v McClelland*, unreported, 2000 WL 1015774 (Minn. App. July 25, 2000). Dullea Co. apparently defaulted on the loan, then sought bankruptcy protection to void the conveyance. Ultimately the matter was settled by having another creditor purchase the property from Ideal Ag and then sell it back to Dullea Land Company on a contract for deed. Throughout the process Dullea Co. continued to operate the farm. Ex. 38.
[3] Ex. 11, fig. 2.
[4] Exs. 6; 11, fig. 1;13.
[5] Exs. 11, fig. 1;15; 16; 18.
[6] Ex. 13.
[7] Exs 6 and 7.
[8] T. 304-05.
[9] T. 39-40.
[10] Ex. 3.
[11] Ex. 13.
[12] T. 306.
[13] T. 50.
[14] Ex. 10 at 22.
[15] Ex. 12.
[16] T. 35-36.
[17] T. 323-327.
[18] T. 291-92.
[19] Mr. Dullea guessed that the photo might have been taken in 1988 because that was one of the years they had extra silage stored on the ground. T. 281
[20] Ex. 5.
[21] Cattle are kept in groups in separate pens for health, safety, and other reasons. T. 320-21.
[22] Ex. 3.
[23] T. 32.
[24] The shed on the lot was also described as “50 x 100,” so the error is obvious.
[25] Ex. 32. The Dullea Co. filed a second application on February 26 or 27, 1998, which did not contain the dimensions of the individual lots. Ex. 33.
[26] Ex. 13.
[27] T. 300-03.
[28] Ex. 3.
[29] T. 302-304.
[30] Ex. 3.
[31] T. 56.
[32] The Soil Conservation Service is now the Natural Resources Conservation Service of USDA.
[33] The Soil Survey Manual is available at http://www.statlab.iastate.edu/soils/ssm/gen_cont.html.
[34] Ex. 13.
[35] T. 313.
[36] Exs. 3 and 13.
[37] T. 316-17.
[38] Ex. 13.
[39] Ex. 13.
[40] Ex. 3.
[41] Exs. 30 and 31.
[42] Ex. 13.
[43] Exs. 15, 16, and 18.

[44] Exs. 21-24.
[45] T. 34-35.
[46] T. 22 and 29.
[47] Ex. 13; T. 352.
[48] T. 349-55.
[49] Ex. 3.
[50] T. 23 and 39.
[51] Ex. 2.
[52] T. 379, 381-85.
[53] Ex. 32.
[54] Notice of and Order for Hearing, Ex. B
[55] Actually, the Petition was submitted in the name of the Dullea Cattle Company and referred to the permit application of the Dullea Land Company. Those names were incorrect.
[56] The Dullea Co. apparently meant the lower fenced portion of lot 4, because that is the portion that was subject to spring flooding and what it later deleted at the hearing.
[57] Notice of and Order for Hearing, Ex. B.
[58] T. 30.
[59] Exs. 8, 9, and 11, Appendix A.
[60] Ex. 4.
[61] Ex. 11.
[62] Ex. 34.
[63] T. 394.
[64] T. 404.
[65] Ex. 34 at 18.
[66] See, Findings No. 51 and 64.
[67] Ex. 34 at 21.
[68] Ex. 34 at 23.
[69] Ex. 34 at 24;T. 409.
[70] Ex. 34 at 24; T. 410.
[71] T. 401 and 434.
[72] T. 129.
[73] Ex. 10 at 9.
[74] Ex. 10 at 2-3.
[75] Ex. 10 at 7.
[76] Ex. 10 at 4-5.
[77] Exs. 10 and 11 at A-3; T. 129-30.
[78] Ex. 10 at 6.
[79] Ex. 10 at 6.
[80] A milligram per liter of water is equivalent to 1 ppm (part-per-million) because a liter of water weighs 1000 grams and a milligram is 1 one thousandth of a gram. See, http://wow.nrri.umn.edu/wow/under/units.html.
[81] Ex. 10 at 78.
[82] Ex. 10 at 8.
[83] T. 124, 155, 164, 169-70.
[84] T. 170.
[85] Ex. 11 at A-4.
[86] Exs. 8 and 11 at A-5.
[87] Ex. 10 at 22.
[88] Ex. 11 at F-1 to F-3.
[89] Exs. 9 and 10 at A-6 and F-4.
[90] Ex. 11 at A-4.
[91] T. 322-23. The application, Ex. 32, had slightly different numbers.
[92] T. 326-27.
[93] Ex. 10 at 4-5.
[94] Ex. 10 at 5.

[95] It is possible that the runoff from the lots would become channelized before reaching the river, but it does not appear that the buffer lengths were set shorter on this basis.
[96] T. 135-36.
[97] Ex. 10 at 5.
[98] The surface constant for permanent meadow is twice that of woodland. However, the "soil cover complex number" (the Curve Number) for permanent meadow is just slightly less than for woodland. Ex. 6 at 23.
[99] Exs. 10 at 78; Ex. 11 at A-2.
[100] Ex. 4 at 2.
[101] T. 65.
[102] T. 90, 115.
[103] T. 51; Ex. 4 at 4.
[104] Ex. 10 at 23.
[105] Adjustments may be made for antecedent moisture conditions. See, e.g., http://www.bsyse.wsu.edu/saxton/spaw/appendices/appendixI.htm.
[106] Ex. 10 at 3.
[107] Ex. 10 at 4, 21, and 23.
[108] T. 59-60; Ex. 4 at 4-5.
[109] Ex. 4 at 4.
[110] Ex. 4 at 5.
[111] Ex. 9.
[112] Ex. 4 at 7.
[113] Ex. 11.
[114] Ex. 11 at 2-3.
[115] Ex. 11 at 29-31, 40, 41.
[116] Minn. R. 1400.7300, subp. 5.
[117] Feeder cattle are counted as one animal unit each.
[118] The parties have stipulated that the revised statute applies to the Dullea Co. application.
[119] The changes are described in a column in the Minnesota Bar Association's magazine Bench & Bar, July 2000, *Notes & Trends, Environmental Law.* Such columns are prepared by practitioners in the area of the law. The column adopts the first interpretation of § 116.07, subd. 7c(a).
[120] Minn. Stat. § 115.03, subd. 5, requires the MPCA to perform any and all acts minimally necessary to maintain the state's NPDES delegation.
[121] By not deleting the "1,000 or more" requirement or changing it to "more than 1,000," state law now minimally exceeds the federal requirement, contrary to legislative intent stated elsewhere throughout Minn. Stat. chs. 115 and 116.
[122] Minn. R. 7020.2003, subp. 2.
[123] 40 C.F.R. § 412.13.
[124] Different numbers are given for other animals.
[125] The Buffalo River is a "navigable water" because it flows into the Red River.
[126] Under 40 C.F.R. § 122.2, "discharge" and "direct discharge" both are defined to mean "discharge of a pollutant." "Discharge of a pollutant" means any addition of any pollutant to waters of the United States from any point source. To determine whether an animal feeding operation is a CAFO, the "from any point source" clause must be ignored, otherwise no feedlot with 300 to 999 animal units could ever be a CAFO.
[127] The EPA has proposed amending 40 C.F.R. Part 122 to eliminate the 25 year, 24-hour storm event provision and to add a provision excluding animal feeding operations more than 100 feet from the water.
[128] *See, Concerned Area Residents for the Environment v. Southview Farms*, 34 F.2d 114, 118-19 (2^{d} Cir. 1994).
[129] Mr. Dullea testified that the MPCA had announced it wanted no feedlots in the Red River Valley. The Floodway Map of Clay County shows that everything between the Dullea Co. farm and the Red River is within the 100-year flood boundary. At least to the extent of that large area of the Valley, it seems Minn. Stat. § 116.07, subd. 7(b), requires such a position, unless flood protection can be provided.
[130] 40 C.F.R. §122.2
[131] 40 C.F.R. §122.23(c)(3).
[132] Minn. R. 7020.0405.
[133] Minn. R. 7050.0215, subp. 2.