Iowa DNR NPDES Permit Rationale for AFO Operations

Date: June 21, 2022

Facility Name: Gregory Feedlots, Inc (North)

Facility ID #: 56217 **NPDES #:** 6556217

Location of the Facility: E½ of SE¼ of Section 28, T71N, R42W, Rawles Township, Mills County

Source: Construction Permit CP-A2007-001 issued January 3, 2007 and Construction Completion Letter dated September 10, 2007, Design Report from Agricultural Engineering Associates dated October 3, 2005; Field Office #4 January 27, 2011 inspection report, page 2.

Description of the Operation & Manure Storage Structure(s) [Type, Capacity; Design]: The applicant currently operates a beef cattle Alternative Technology (AT) open feedlot operation on land owned by Mar-I-War Company. The west section consists of feedlot area of 6.3 acres and the east section feedlot area is 7 .5 acres. The open feedlot includes three solids settling basins (SSB) designed to conform to NRCS Conservation Practice Standard 350 as well as DNR requirements and one large vegetative treatment area (VTA). The site has been acting as a natural VTA system for several decades prior to the State requirements for greater control.

Effluent flows into one of three solids settling basins. Each settling basin has a controlled riser pipe that is designed to discharge the liquid into the VTA only when the need to dewater the basin arises. It should be noted that the solids settling basins are designed to hold the 25-year, 24-hour precipitation events. The liquid from the basins enters the VTA through a gated pipe to assure even distribution of effluent into the VTA. The VTA is completely bermed on all four sides. The west diversion berm has a height of 2 feet and the east diversion has a height of 2.5 feet for the upper portion and 3.5-foot on the lower flatter slopes. All storm water is diverted around the VTA. Additional spreaders were added to the VTA to help slow the flow of effluent. Perforated tile was installed along the perimeter of the VTA and only under the spreaders (mounded dirt not more than 6 inches tall). Non-perforated tile was added where the tile crosses under the VTA (see map on 2011 Inspection, page 2).

The VTA is be graded level from side to side and will have approximately a 1% slope from end to end. A gate valve is located at the outlet of the VTA and must be physically opened to allow a discharge. The solids settling basins used in AT system shall not be required to comply with the liner design and construction requirements of 567 IAC 65.109(7), provided the SSBs do not retain collected open feedlot effluent for more than seven consecutive days following a precipitation event during the growing season April 1 through October 31.

The alternative treatment system can serve as permitted a total maximum animal capacity of 2,000 head of beef cattle on 13.8 acres of open feedlot.

Generated manure must be land applied according to your DNR approved nutrient management plan (NMP).

Discharge Limitations [Rate & Frequency of the Proposed Discharge]: Because this is an AT System, it is allowed to discharge. If a discharge occurs, the permittee is required to seek technical services of a P.E. licensed in the State of Iowa or a certified AT modeler to perform required annual discharge modeling and, if required, modify the existing installed AT system to improve efficiency in order to meet required discharge performance. The AT system must provide equivalent performance to that achieved by a properly designed and operated 25-year, 24-hour runoff control system based on Environmental Protection Agency's (EPA) revised CAFO regulations from December 22, 2008. In accordance to Iowa Administrative Code (IAC) 567-65.110(1) "a" & "b" adequate capacity must be provided within the AT system and/or within the solids settling facility to contain expected open feedlot effluent during the winter time

“non-growing season from November 1 through March 31,” or to hold the 25-year, 24-hour precipitation event, whichever is greater. Controls on the entire AT system shall prevent release of collected open feedlot effluent to waters of the United States during the winter time.

Basis for Effluent Limitations: Federal Effluent Guidelines

Classification & Description Of The Receiving Stream: The designated stream that will be affected by any release from this operation is an Plum Creek which is designated as presumed Class “A1, B(WW-2)”. Class A1 waters are primary contact recreational use waters in which recreational or other uses may result in prolonged and direct contact with the water, involving considerable risks of ingesting water in quantities sufficient to pose a health hazard. Such activities would include, but not be limited to, swimming, diving, water skiing, and water contact recreational canoeing. Waters designated Class B(WW2) are those in which flow or other physical characteristics are capable of supporting a resident aquatic community that includes a variety of native nongame fish and invertebrate species. The flow and other physical characteristics limit the maintenance of warm water game fish populations. These waters generally consist of small perennially flowing streams.

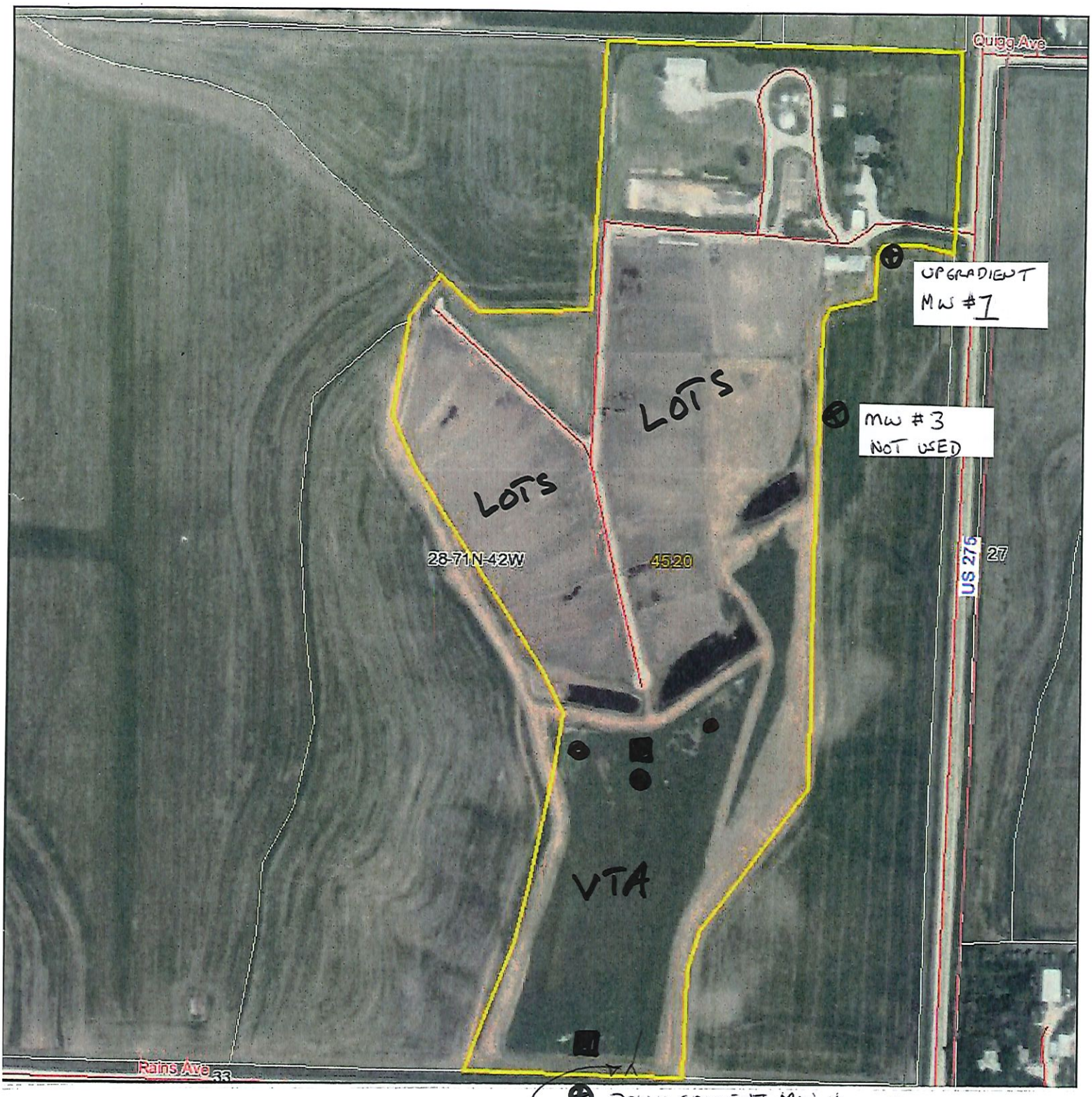
Soil & Water Sample Collection During Monitoring Process: Surface and groundwater sample collection (exact place, date, and time of measurement) preservation and analysis shall be in accordance with those prescribed in subrule 567 IAC 63.1(1) which adopts by reference 40 CFR Part 136, revised as of July 1, 2007. Soil samples must be collected, handled and analyzed according to procedural details from Iowa State University extension publication PM 287, “Take a Good Soil Sample to Help Make Good Decisions.” or other credible soil sampling publications.

Permit Writer: Marlon Mueller

GREGORY NORTH Aerial Map

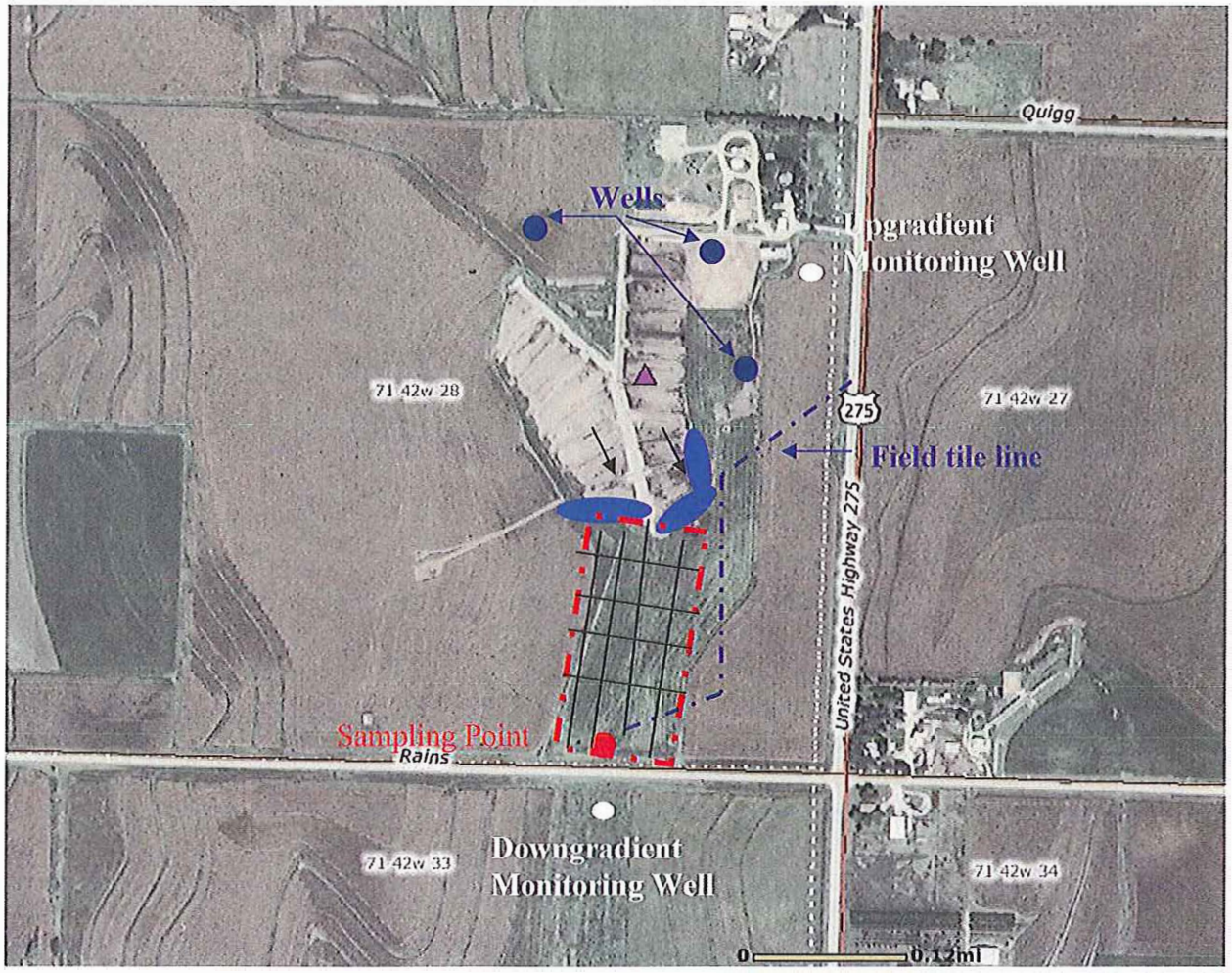
Gregory North

2022



GENERAL FACILITY DESCRIPTION

This facility consists of an alternative technology (AT) system consisting of three solids settling basins and one VTA. Tile lines were recently installed to prevent ponding in the VTA. The field tile is connected to the tiles in the VTA just prior to leaving the system. The aerial photo below documents the layout of this feedlot.



All manure is directed to the manure controls. The VTA was snow covered during this inspection.

Manure flows into one of three solids settling basins. The settling basins have controlled riser pipes that are designed to discharge the liquid into the VTA only when the need to dewater the basins arises. It should be noted that the solids settling basins are designed to hold the 25-year, 24-hour precipitation events. The liquid from the basins enters the VTA through a gated pipe. The VTA is completely bermed on all four sides. All stormwater is diverted around the VTA.

Spreaders were added to the VTA to help slow the flow of water down. Perforated tile was installed along the perimeter of the VTA and under the spreaders. Non-perforated tile was added where the tile crosses under the VTA. There is about 60-70 feet between the tile lines and they are about four feet deep from the ground level.

The outlet at the VTA must be physically opened to allow a discharge. The monitoring station currently being used by the facility is called a Global Water Monitor (WL16). This type of system is removed during the winter months. It measures the depth of the water traveling through the outlet pipe and is battery operated.

Gregory_North_VTA Area

Aerial Map

Map Center: 40° 55' 4.75, -95° 40' 26.88

0ft 229ft 458ft

28-71N-42W
Mills County
Iowa

N
W E
S

2/22/2021

Natural Fertilizer Products

Maps Provided By:
surety® CUSTOMIZED ONLINE MAPPING

 www.AgriDataInc.com

1/3/07

STATE OF IOWA
DEPARTMENT OF NATURAL RESOURCES (IDNR)
HENRY A. WALLACE BUILDING
DES MOINES, IOWA 50319

CONSTRUCTION PERMIT

Gregory Feedlot
Jim Gregory, Owner
1164 305th Avenue
Tabor, IA 51653

Permit No.: **CP-A2007-001**
File: Agriculture
RE.: Gregory Feedlot
Project No.: 2-65-00-0-03

In accordance with the provisions of Iowa Code Section 459A.201 and 567 Iowa Administrative Code (IAC) 65.105(455B), the Director of the Department of Natural Resources does hereby issue a permit for:

Construction of two (2) vegetative treatment areas (VTAs),

VTA	Dimensions (ft.)	VTA/Feedlot
Section A	965 x 258	0.91
Section B	1380 x 240	1.00

including all necessary effluent conveyance structures, spreaders, flow measurement devices, and sampling stations in the E½ of the SE¼ of Section 28, T71N, R42W, Rawles Township, Mills County, Iowa. The maximum animal capacity of this feedlot is 2,000 head of beef cattle (2,000 animal units).

This permit is issued subject to the following conditions and requirements:

1. This construction permit is issued based on the apparent compliance of the design with DNR AT guidelines, the requirements of Iowa State University (ISU) approved AT Model dated May 31, 2005, applicable standards of IAC Chapter 65, and good engineering practices. However, due to the experimental nature of the AT system, if the system fails to perform as good or better than the conventional control system as defined in the conditional NPDES permit, then the applicant shall be required by the department either to modify the AT system, or to install a conventional control system.

2. No material change in the construction of this project shall be undertaken, unless first authorized by this Department.

3. The construction of this project shall be initiated within one year and completed within three (3) years of the issuance of this permit or this permit is no longer valid.

4. The design capacity of the open feedlot is for a total animal capacity of 2,000 head of beef cattle and a feedlot area of 13.8 acres.

5. The solids settling basin for this AT project is designed to store feedlot runoff from a 25 year 24 hour storm event, and the VTA is designed based on the AT Model which has predicted to have either no release at all in most years or small amount releases under a very low frequency storm event or chronic wet weather conditions. **Any release (runoff) exiting the VTA must be directed through a flow measuring device and sampling station.** In the case of discovering that any component of the system is malfunctioning or undersized during operation, the permittee shall take the necessary corrective action in consultation with his consulting engineers or Iowa DNR.

6. The permittee shall install and maintain the VTA runoff flow volume measuring devices and water quality sampling stations in functioning mode at all times by performing the routine inspections, services, and calibrations as required by the manufacturers, consulting engineers, and NPDES permit.

7. Within thirty days after completion of construction, your engineer shall submit a certification that the VTAs were:
   - Supervised by the engineer or his designee during critical points of construction.
   - Inspected by the engineer after completion of construction.
   - Constructed in accordance with the approved design plans and specifications. If actual construction deviates from the approved plans, identify all changes and certify that the changes were consistent with the standards of DNR rules or statute.
   - Constructed in accordance with the drainage tile removal standards of the 567 Iowa Administrative Code (IAC) Chapter 65.15 (1), and including a report of the findings and action taken to comply with the subrule.
   - Constructed in accordance with the minimum separation distances of the Iowa Code section 459.310.

8. All manure removed from the feedlot and the solid settling basins shall be disposed of by land application in a manner which will not cause surface or groundwater pollution and in accordance with the requirements of rule 567 IAC 65.3(459).

9. No construction activities shall be initiated unless a National Pollutant Discharge Elimination System (NPDES), General Permit No. 2, for Storm Water Discharge is obtained from this department if the required site disturbance and preparation **equals or exceeds one (1) acre**.

10. If water quality standard violations occur, the Department may impose additional manure control requirements upon this feedlot, as specified in subrule 65.101(2) "b".

11. The issuance of this permit in no way relieves the permittee of the responsibility for complying with all local, state and federal laws, ordinances, regulations and other requirements applying to the construction and operation of this facility.

You have the right to appeal any condition of this permit as provided in 561 IAC 7.2 and 7.5. Please contact the reviewer, Douglas Opheim, P.E., at 712/262-4177 with any questions or comments.

For the Department of Natural Resources: JEFFREY R. VONK, DIRECTOR

Robert Galla

for By: Wayne Farrand

ENVIRONMENTAL SERVICES DIVISION

Date: January 3, 2007

c: Agricultural Engineering Associates, Inc., Attn.: L. Frank Young, PE, 1000 Promontory Drive, PO Box 4, Uniontown, KS 66779
DNR - Field Office 6
DIO/CP File #2-65-00-0-03

RECORD COPY

File Name Ag 56217

Sender's Name RJP

CURRY - WILLE & ASSOCIATES
CONSULTING ENGINEERS P.C.
425 S. 2nd ST.
P. O. BOX 1732
AMES, IOWA 50010
PH. 515-232-9078

September 10, 2007

Iowa Department of Natural Resources
Animal Feeding Operations
502 E. 9th Street
Des Moines, IA 50319-0034

Re: Gregory Feedlot, Mills County 56217

To Whom It May Concern:

This letter is to certify that Gregory Feedlots, Inc has completed construction (Construction Permit #CP-A2007-001) of their open beef feedlot AT runoff control system, originally designed by Agricultural Engineering Associates of Uniontown, KS, and taken over by Curry-Wille & Assoc. of Ames, IA. Construction was supervised by me or my designee during critical points and was personally inspected by me after construction was completed.

- The project was completed in accordance with the plans with the following changes:
  - Replaced center settling bench with settling basin as submitted to DNR 6/25/07
  - Moved east settling basin slightly to avoid cuts over an underground pipeline
- The drainage tile investigation per IAC 567 65.15(1) resulted in finding no outside tile
- The system was built in accordance with minimum separation distances per IAC 567-65.11(3)

I certify to the best of my knowledge that the above is true and correct.

Sincerely,

Jeff Lorimor, PE #7223
Curry-Wille & Associates Consulting Engineers, P.C.

LICENSED PROFESSIONAL ENGINEER
JEFFERY C. LORIMOR
07223
IOWA

cc: Gregory Feedlots 1164 305th Ave, Tabor, IA 51653

9/10/07

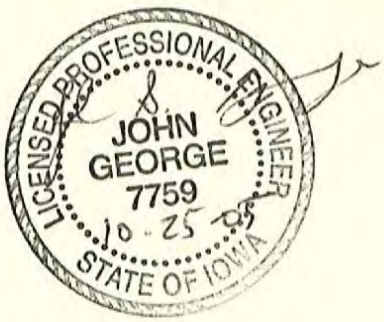
74109 SEP13'07 AM 8:47

Agricultural
Engineering
Associates
1000 Promontory Drive
PO Box 4
Uniontown Kansas 66779
Phone: 620-756-1000
Fax: 620-756-4600

VTA SYSTEM

Gregory Feedlot (North Feedlot)

Tabor, Iowa



October 3, 2005

Agricultural Engineering Assoc., Inc.

Planning, design, construction supervision and management of agricultural production facilities and pollution control systems

NARRATIVE DESIGN REPORT

Existing site. The Gregory North Feedlot Site consists of pens located on the west and east side of an elongated hill. This layout results in essentially two feedlots in regards to drainage. The west section consists of feedlot area of 6.3 acres; the east section feedlot area is 7.5 acres. The feedlot slopes vary with an average of approximately 6.5%. At the base of each feedlot area is the flow path of drainages. The drainages drain to the south 950 feet to a small pond with culvert drain and embankment. This drainage serves as the primary VTA. South of the pond and culvert drain is a road. Under this road is a second culvert at a higher elevation than the culvert drain. South of the road the drainage follows a shallow grassed waterway for approximately 1100 feet. This waterway will act as a secondary VTA for the system.

Soils as mapped in the Mills County, Iowa Soil Survey were listed as Napier silt loam. From a detailed soil survey the soils observed and examined were similar to Nodaway soils in the upper stratified layers and similar to Colo/Kennebec in the lower dark colored silty material. See the Soils Report. Model runs were made using Kennebec soil as a worst-case scenario.

The site has been acting as a natural VTA system for several decades. The west feedlot area has natural settling benches that have been constructed through feedlot grading operations. The feedlot has shaped the pens over the years to promote sheet flow. This enhances the settlement of solids near the base of the slopes. The west side has natural settling benches that have been enhanced by pen grading activities.

Vegetative Treatment Area Enhancement. Settling basins and a settling bench are planned for solids removal from the feedlot slopes. The settling bench has a slope parallel to the flow lines of 0.002 feet per foot. Perpendicular to the flow line the benches are flat. The flow length of the settling bench is 50 feet.

Two settling basins are planned for the site. One will be used for feedlot area A on the west side and another for the northeast portion of feedlot area B.

The settling basins are outletted through 8 inch diameter Hickenbottom type outlets. The discharge is distributed for sheet flow on the upper ends of the VTA with perforated pipe buried in course washed gravel.

The VTA system was modeled as two separate VTA's, one for each feedlot area. The modeling was completed assuming settling benches for all the feedlot. There should be little variation however with the addition of settling basins. Irrigation borders placed at 100 feet north and south along the VTA will effectively divide the treatment area to correspond with the modeling. Spreaders are placed about 100 feet along the length of the VTA. Modeling was completed with spreaders placed at 207 feet. The VTA for the west feedlot area is approximately 965 feet long by 260 feet in width. The VTA for the east feedlot area is approximately 1380 feet long by 240 feet wide. The average slope of the VTA's are approximately 1 percent. As the contours are relatively smooth in the VTA area, grading is not proposed. In the lower end of the VTA where the small pond was located, fill is proposed to eliminate the depression.

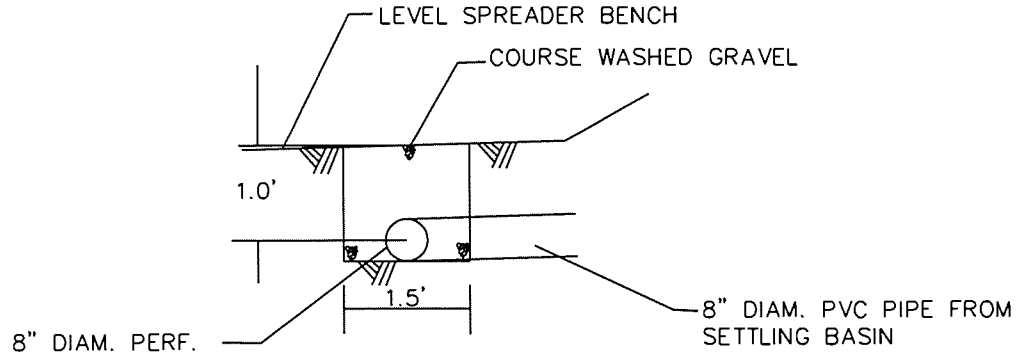
Diversions are designed for the west and east side of the site. The drainage area for the west diversion is 33.5 acres and the drainage area for the east diversion is 113 acres. The west diversion berm has a height of 2 feet. The east diversion has a depth of 2.5 feet for the upper portion and has a 3.5-foot depth on the lower flatter slopes.

Monitoring Wells. Three groundwater monitoring wells have been established onsite. Depth to water for the two upslope monitoring wells are 13.4 and 18.5 feet. Depth to water for the monitoring well south of the primary VTA is 8.8 feet. Laboratory chemical analysis for the three monitoring wells is within this report.

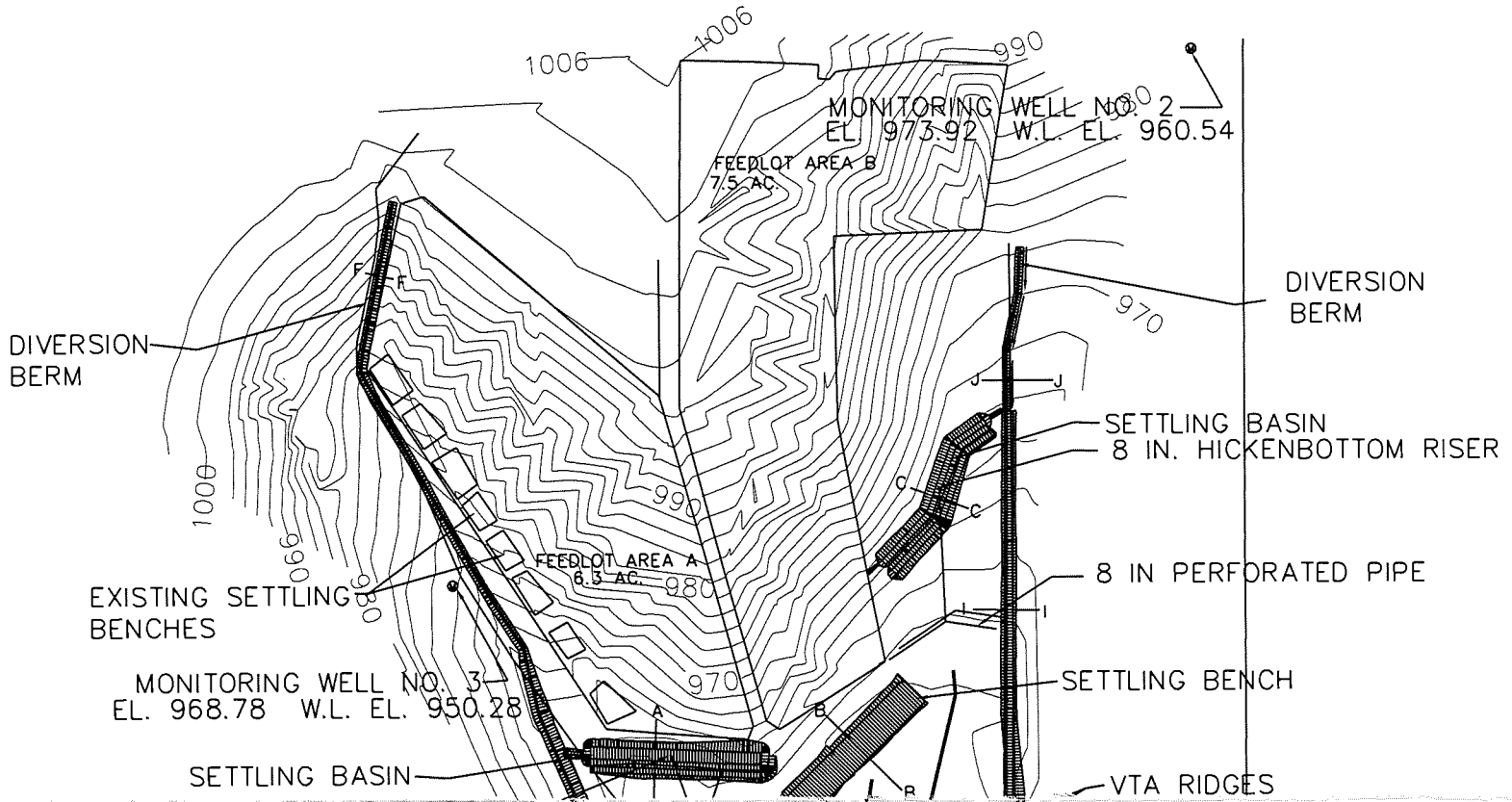
Storage For 25-Year 24-Hour Storm. The 25-year 24-hour precipitation for the site is 5.6 inches. For feedlot there is 14.0 acres. With a runoff curve number of 90 the runoff for the storm is 4.46 inches. For 14.0 acres the runoff is 5.20 acre-feet. For the upper

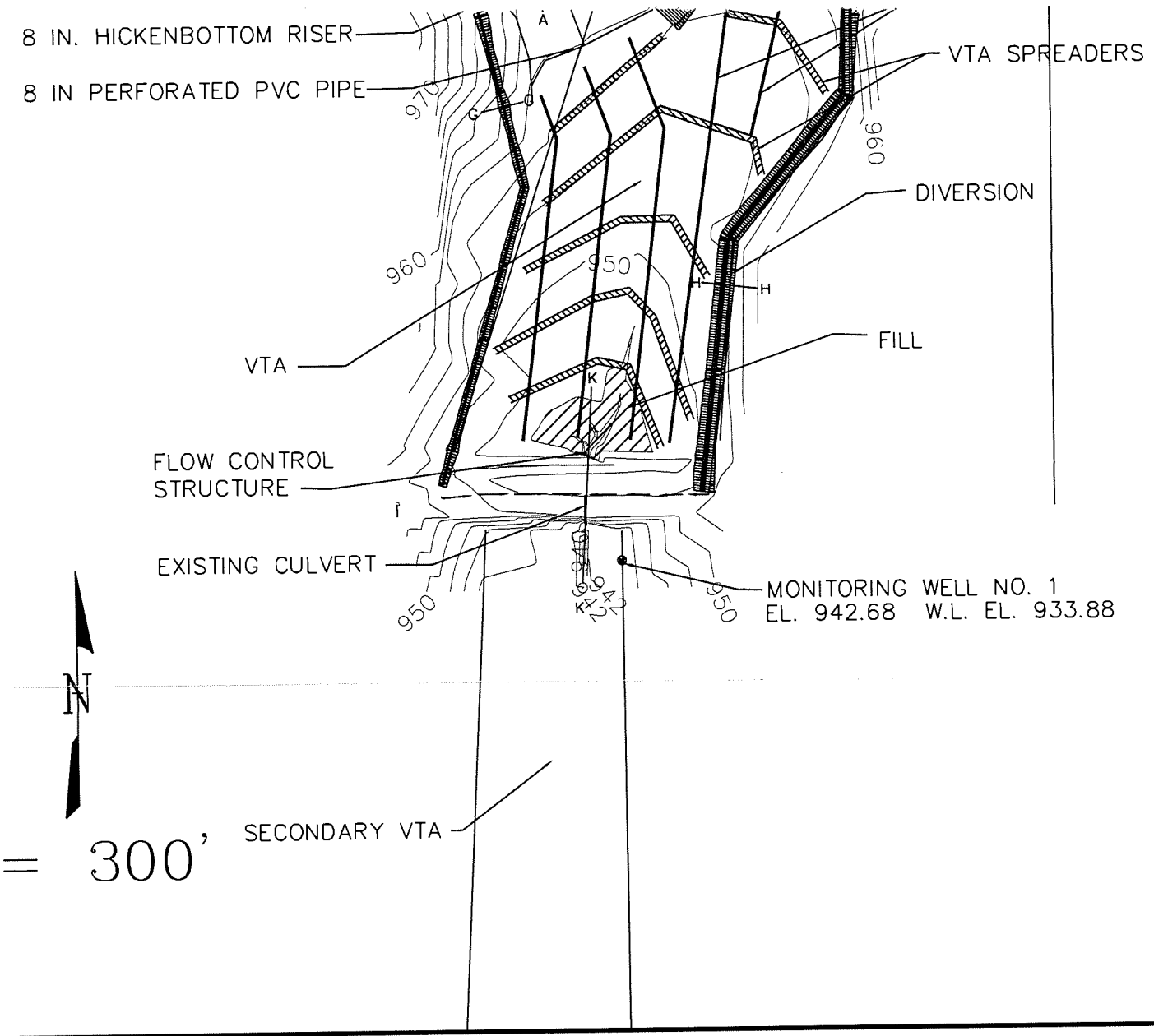
VTA the runoff curve number would be 61. The runoff for the storm would be 1.74 inches for 17.3 acres for a total of 2.50 acre-feet. For the ponded area of the VTA the runoff curve number would be 100 for a runoff of 5.60 inches on 4 acres. This runoff would be 1.87 acre-feet. The total runoff for the storm would be 9.57 acre-feet. The available storage at elevation 952.0 is 10.8 acre-feet.


Gregory North
Mills County
Up GW
SSB
VTA
N
SSB
SSB
Hwy 275
VTA
Down GW



PVC PIPE OUTLET DETAILS





1'' = 300'

Agricultural Engineering Associates 1000 Promontory Dr. Uniontown, KS 66779 Phone: 620-756-1000 Fax: 620-756-4600	GREGORY FEEDLOT 1164 305th AVE TABOR, IA 51653	ENGINEER EGC DATE 08/08/05 DRWN BY EGC CHK'D BY JAG DATE 08/08/05	NORTH SITE PROPOSED SITE MAP	REV# / DATE / DESCRIPTION 0	PROJECT NO. 02787 DRAWING NO. 01003 Rev. # 0 Date 08/08/05	North.dwg