

THIS DESIGN IS FOR A SINGLE STAGE LAGOON

| | |
|--|----------------|
| CLIENTS NAME | STROTHER SWINE |
| COUNTY | FRANKLIN, NC |
| TODAYS DATE | MARCH 7, 1995 |
| DISTANCE TO NEAREST NONFARM RESIDENCE => | 1600 FEET |
| NUMBER OF PIGS WEANLING TO FEEDER => | 0 |
| NUMBER OF PIGS FEEDER TO FINISH => | 5760 |
| NUMBER OF SOWS FARROW TO WEANLING => | 0 |
| NUMBER OF SOWS FARROW TO FEEDER => | 0 |
| NUMBER OF SOWS FARROW TO FINISH => | 0 |
| DEGREE OF ODOR CONTROL => | 1.0 |
| (minimum 1.0 cu. ft. per lb SSLW) | |
| (maximum 3.0 cu. ft. per lb SSLW) | |
| NUMBER OF YEARS OF SLUDGE ACCUMULATION > | 6.3 YEARS |

| | |
|---|----------------------|
| TOP LENGTH AT NORMAL WATER LEVEL => | 420.0 FEET |
| TOP WIDTH AT NORMAL WATER LEVEL => | 300.0 FEET |
| NORMAL WATER LEVEL ELEVATION => | 117.0 FEET |
| SEASONAL HIGH WATER TABLE ELEVATION => | 111.0 FEET |
| LAGOON BOTTOM ELEVATION => | 104.0 FEET |
| Depth of Permanent Water | 13.0 feet |
| (minimum depth without sludge = 6 feet) | |
| (minimum depth with sludge = 8 feet) | |
| SIDE SLOPES => | 3.0:1 |
| Permanent Volume Required | 1166400.0 cubic feet |
| Permanent Volume Provided | 1299324.0 cubic feet |

| | |
|--|---------------------|
| ADDITIONAL DRAINAGE AREA IN SQUARE FEET> | 0 SQUARE FEET |
| (i.e. pumpout pond & other outside area) | |
| LENGTH OF PUMPING CYCLE => | 180 DAYS |
| GALLONS OF FRESH WATER ADDED DAILY => | 5184 GALLONS |
| EXCESS RAINFALL ABOVE EVAPORATION => | 7.0 INCHES |
| 25YR/24HR STORM RAINFALL => | 6.6 INCHES |
| FREEBOARD => | 2.0 FEET |
| Temporary Storage Volume | 486055.4 cubic feet |

| | |
|---|------------|
| Top of Dam Elevation = | 122.9 feet |
| Inside Dimensions of Lagoon at Top of Dam | |
| Length = | 456.6 feet |
| Width = | 336.6 feet |

| | |
|---------------------------|------------|
| Begin Pumping Elevation = | 120.2 feet |
| Stop Pumping Elevation = | 117.0 feet |

1. STEADY STATE LIVE WEIGHT

| | | |
|--|---|------------|
| 0 head weanling to feeder x 30 lbs. | = | 0 lbs |
| 5760 head feeder to finishing x 135 lbs. | = | 777600 lbs |
| 0 sows farrow to weanling x 433 lbs. | = | 0 lbs |
| 0 sows farrow to feeder x 522 lbs. | = | 0 lbs |
| 0 sows farrow to finish x 1417 lbs. | = | 0 lbs |
| TOTAL STEADY STATE LIVE WEIGHT (SSLW) | = | 777600 lbs |

2. SLUDGE ACCUMULATION

Sludge accumulates at the rate of 0.080 cu. ft. per year per pound of STEADY STATE LIVE WEIGHT in swine.

Years of sludge accumulation in design? 6.3

Sludge Volume = 388800.0 cubic feet

3. REQUIRED LIQUID VOLUME OF LAGOON

Design for 1.0 cu. ft. per pound SSLW

Total Volume = (SSLW * Design factor) + Sludge Volume

Total Volume = 1166400.0 cubic feet

4. NORMAL LAGOON LIQUID LEVEL

Maintain normal lagoon liquid level at elevation 117.0 feet
Construct lagoon bottom elevation 104.0 feet

Lagoon size for normal lagoon liquid volume using prismoidal formula

| SS/END1 | SS/END2 | SS/SIDE1 | SS/SIDE2 | DEPTH |
|---------|---------|----------|----------|-------|
| 3.0 | 3.0 | 3.0 | 3.0 | 13.0 |

AREA OF TOP
LENGTH * WIDTH =
420.0 300.0 126000.0 (AREA OF TOP)

AREA OF BOTTOM
Lb * Wb =
342.0 222.0 75924.0 (AREA OF BOTTOM)

AREA OF MIDSECTION
(Lm * Wm) =
381.0 261.0 99441.0 (AREA OF MIDSECTION)

CU. YD. = [AREA TOP + (4*AREA MIDSECTION) + AREA BOTTOM] * DEPTH/6
126000.0 397764.0 75924.0 2.167

VOLUME OF LAGOON AT NORMAL LAGOON LIQUID LEVEL = 1299324.0 CU. FT.

VOLUME NEEDED = 1166400.0 CU. FT.

THE SURFACE DIMENSIONS OF THE LAGOON AT NORMAL LIQUID LEVEL
ARE 420.0 FEET LONG BY 300.0 FEET WIDE

5. DIKE

Place spoil as a continuous dike to elevation 122.9 feet.

6. TEMPORARY STORAGE REQUIRED

DRAINAGE AREA:

Lagoon (top of dike)

Length * Width = 456.6 * 336.6 = 153692 square feet

Additional Drainage Area

0 square feet

TOTAL DA 153692 square feet

Pumping cycle to be 180 days.

6A. Volume of waste produced

Volume = $777600 \text{ SSLW} * 0.01 \text{ gallon/lb. SSLW/day} * 180 \text{ days}$
in the pumping cycle / 7.48 gallons per cu. ft.

Volume = 187123.0 cubic feet

6B. Volume of wash water

This is the amount of fresh water used for washing floors or volume fresh water used for a flush system. Flush systems that recycle the lagoon water are accounted for in 6A.

Volume = $5184 \text{ gallons/day} * 180 \text{ days in the pumping}$
cycle divided by 7.48 gallons per cu. ft.

Volume = 124748.7 cubic feet

6C. Volume of rainfall in excess of evaporation

Use period of time when rainfall exceeds evaporation by largest amount.

Excess rainfall (difference) = 7.0 inches

Volume = $7.0 \text{ inches} * \text{DA} / 12 \text{ inches per foot}$

Volume = 89653.4 cubic feet

6D. Volume of 25 year - 24 hour storm

Volume = 6.6 inches * DA / 12 inches per foot

Volume = 84530.4 cubic feet

TOTAL REQUIRED TEMPORARY STORAGE

6A. 187123.0 cubic feet

6B. 124748.7 cubic feet

6C. 89653.4 cubic feet

6D. 84530.4 cubic feet

TOTAL TEMPORARY STORAGE 486055.4 cubic feet

7. DEPTH OF STORAGE REQUIRED (ABOVE NORMAL LIQUID ELEVATION OF LAGOON)

Depth required = Volume of temporary storage divided by surface area of lagoon.

Depth required = 486055 cu. ft. / 126000 sq. ft.
Depth required = 3.9 feet

Normal lagoon liquid elevation = 117.0 feet

Depth required = 3.9 feet

Freeboard = 2.0 feet

Top of Dam = 122.9 feet

THE DIMENSIONS OF THE INSIDE EDGE OF THE DAM AT ELEVATION 122.9
ARE 456.6 FEET BY 336.6 FEET

8. SET BEGIN PUMPING ELEVATION

PUMPED STORAGE VOLUME

6A. 187123.0 cubic feet

6B. 187123.0 cubic feet

6C. 187123.0 cubic feet

TOTAL PUMPED VOLUME = 401525.1 cubic feet

Depth required = Volume of pumped storage divided by surface area of lagoon at normal water level.

Depth required = 401525.1 cu. ft. / 126000 sq. ft.

Depth required = 3.2 feet

DESIGNED BY: *Frank Evans* APPROVED BY:

DATE: 3-7-95

DATE:

SPECIFICATIONS FOR CONSTRUCTION OF WASTE TREATMENT LAGOON

Producer: STROTHER SWINE

Clearing: All trees and brush shall be removed from the impoundment area before construction is started. The foundation of the lagoon shall be cleared of all trees, stumps, roots, brush, sod, organic soil, and debris. All stumps and all roots exceeding 1 inch in diameter shall be removed to a minimum depth of 1 foot. Satisfactory disposition will be made of all debris. After clearing is completed the foundation area shall be loosened thoroughly and roughly leveled, with suitable equipment, before placement of any embankment material.

Cutoff Trench: A cutoff trench shall be excavated to a minimum depth of ~~24-36~~ inches under the embankment. The exact depth shall be determined on site by SCS. The trench side slopes shall be 1:1 or flatter and the width will be a minimum of 6 feet, but will depend on the equipment being used. The cutoff trench shall be backfilled with CL material. The trench shall be backfilled in 9 inch layers and compacted with a sheepsfoot roller with a minimum of 4 passes per unit width of fill lift. ~~If sheepsfoot roller is not used, the trench shall be backfilled in 4 inch layers and compaction shall be equivalent to or better than the routing of the hauling and spreading equipment over the fill in such a manner that every point on the surface of each layer of fill will be traversed by not less than one tread track of the loaded equipment traveling in a direction parallel to the main axis of the fill.~~ All standing water shall be removed from the trench before backfilling is started.

Existing Tile Drains: When tile drains are encountered, the tile will be dug up and removed. The tile trench shall be backfilled with a compacted layer of CL or CH material.

Excavation: Topsoil shall be stocked piled separately for later use. The bottom of the lagoon shall be excavated as shown on the plans. Where pervious material (SP, ^{5"}quartz veins, etc.) is exposed during excavation, it shall be undercut and backfilled with a compacted layer of highly plastic (CL, CH) material approximately ~~2~~³ feet in thickness. Scarify and compact the bottom and, where practicable, the side slopes of the lagoon to decrease the permeability of the soil in the lagoon.

Embankment Construction: The material placed in the embankment shall be free of sod, roots, stones over six (6) inches in diameter, and other objectionable materials. Pervious material shall not be used in the embankment. ~~Construction of the embankment shall be made in layers not to exceed 4 inches in thickness. Compaction shall be equivalent to or better than the routing of the hauling and spreading equipment over the fill in such a manner that every point on the surface of each layer of fill will be traversed by not less than one tread track of the~~

SPECIFICATIONS FOR CONSTRUCTION OF WASTE TREATMENT LAGOON

~~loaded equipment traveling in a direction parallel to the main axis of the fill. If pans are not used,~~ Construction of the embankment shall be made in layers not to exceed 9 inches in thickness and compacted with a sheepsfoot roller with a minimum of 4 passes per unit width of fill lift. At any time the embankment surface becomes "slickened" such that the succeeding layer will not bond to the previous layer, scarify the previous layer sufficiently to assure bonding of the surfaces before continuing with the fill operation. Construction of the fill shall be undertaken only at such times that the moisture content of the fill material will permit a reasonable degree of compaction. Construction of the embankment shall allow an additional 5 % for settlement. Stock piled topsoil shall be spread over top of embankment and outside side slopes for the establishment of vegetation.

Pollution Control During Construction: Stripping of embankment and borrow areas shall be done as they are needed in a normal sequence of construction. Use temporary mulch protection on all disturbed areas that are subject to erosion and will not have substantial additional work performed for 30 days.

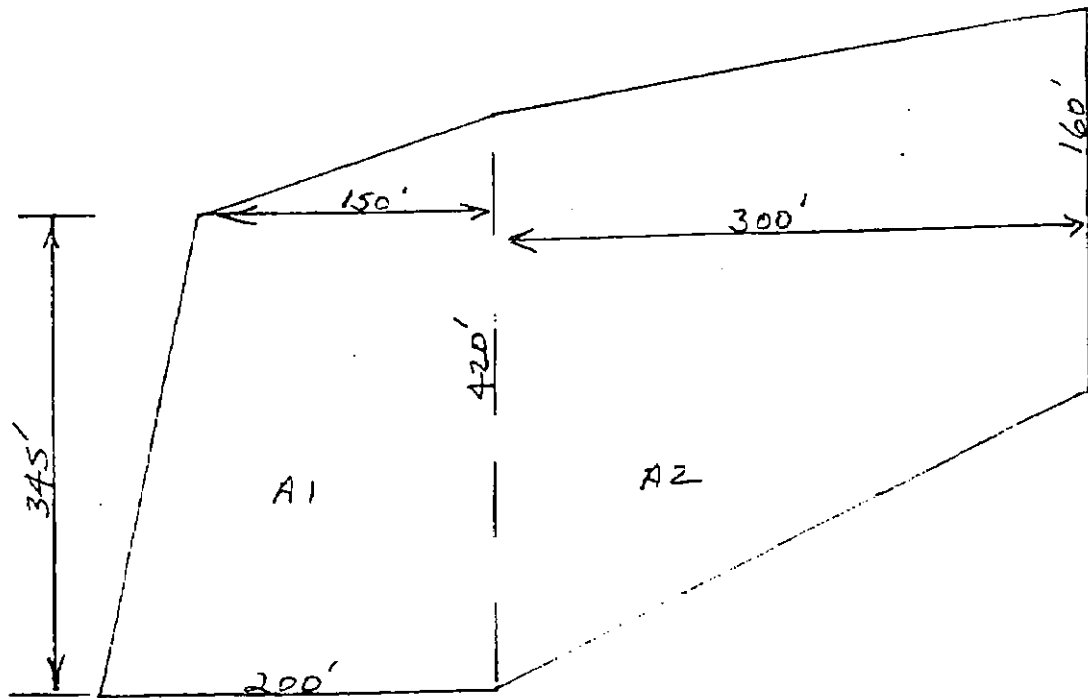
Vegetation: Vegetation shall be established on the slopes, embankment top and all other disturbed areas, except the area that will be inundated, as specified in the plans as soon as possible after construction. Necessary steps shall be taken to ensure that a good stand of vegetation is established in a reasonable amount of time.

Seeding rates are:

| | |
|------------------|----------------------------|
| <u>60</u> | lb. <u>TALL FESCUE</u> |
| <u>30</u> | lb. <u>RYE GRASS</u> |
| <u>1000</u> | lb. 10-10-10 |
| <u>2</u> | tons lime |
| <u>100 Bales</u> | 100 wheat straw |

Permanent Stake: A permanent stake (CCA salt treated 4"x4" post or 1 inch diameter PVC pipe with tee) marked to indicate pumping level elevations, shall be placed in the inside slope at one end of the lagoon.

N.C. STROTHER SWINE
 JE 8-8-94
 AREA OF LAGOON SURFACE



$$A1 = \left(\frac{345 + 420}{2} \right) \left(\frac{150 + 200}{2} \right) = (382.5)(175) = 66,937.5 \text{ ft}^2$$

$$A2 = \left(\frac{420 + 160}{2} \right) (300) = (290)(300) = 87,000 \text{ ft}^2$$

$$\text{TOTAL AREA} = \underline{153,937.5 \text{ ft}^2}$$

$$\text{USE } (456')(336') = 153,216 \text{ ft}^2$$

J. Evans, C. E.T.
 8-8-94

STROTHER SWINE
FRANKLIN COUNTY, N.C.

REVISED EARTH WORK SUMMARY

| <u>ESTIMATED</u> | QUANTITIES | |
|--|--------------------|--------------------|
| | EXCAVATION | EARTH FILL |
| LAGOON ^{Top @ 123.1} _{Bottom @ 104.0} | 36,178 C.Y. | 43,725 C.Y. |
| PAD (131.7-130.3) | 29,722 C.Y. | 10,735 C.Y. |
| CUT-OFF TRENCH | 1391 C.Y. | 1391 C.Y. |
| CLAY LINER | <u>7874 C.Y.</u> | <u>7874 C.Y.</u> |
| | <u>75,165 C.Y.</u> | <u>63,725 C.Y.</u> |

CUT/FILL RATIO = 1.18 : 1

NOTE:

LAGOON AND PAD QUANTITIES FROM
GRID SURVEY (50 ft spacing)

CUT-OFF TRENCH AND CLAY LINER
QUANTITIES MAY VARY ACCORDING
TO TYPE SOILS ENCOUNTERED.

Frank Eward

C.E.T.

3-28-95

OH-IRM 2/15/88

US Department of Agriculture
Soil Conservation Service

PLANNED

QUANTITY CALCULATIONS

prepared for

STROTHER SWINE

in

FRANKLIN County, North Carolina

Designer : FRANK EVANS
Date : 03/28/95
Job Number 022

Checker _____
Date _____

PAD EXCAVATION

| lot dth | Left SS | Right SS | Off-CL (ft) | CL Sta | Dist (ft) | ** EXCAVATION ** | | ** FILL ** | |
|------------|------------|-------------|----------------|-----------|--------------|------------------|--------------------|----------------|--------------------|
| | | | | | | Area (SqFt) | Volume (Cu.Yds) | Area (SqFt) | Volume (Cu.Yds) |
| | | | | 0+44 | 36 | 0 | + 2187.1 | | |
| 120 | 3:1 | 3:1 | 100.0 | 0+50 | 20 | 3280.6 | 2336.8 | 0.0 | 0.0 |
| 120 | 3:1 | 3:1 | 100.0 | 1+00 | 50 | 3028.6 | 7549.8 | 0.0 | 0.0 |
| 120 | 3:1 | 3:1 | 100.0 | 1+50 | 50 | 2601.5 | 12033.3 | 0.0 | 0.0 |
| 120 | 3:1 | 3:1 | 100.0 | 2+00 | 50 | 2240.7 | 16151.0 | 0.0 | 0.0 |
| 120 | 3:1 | 3:1 | 100.0 | 2+50 | 50 | 2206.4 | 19879.9 | 0.0 | 0.0 |
| 420 | 3:1 | 3:1 | 100.0 | 3+00 | 50 | 1820.7 | 22946.7 | 0.0 | 0.0 |
| 420 | 3:1 | 3:1 | 100.0 | 3+50 | 50 | 1491.4 | 25211.1 | 0.0 | 0.0 |
| 420 | 3:1 | 3:1 | 100.0 | 4+00 | 50 | 954.1 | 26608.5 | 0.0 | 0.0 |
| 420 | 3:1 | 3:1 | 100.0 | 4+50 | 50 | 555.2 | 27321.4 | 0.0 | 0.0 |
| 420 | 3:1 | 3:1 | 100.0 | 5+00 | 50 | 214.7 | 27534.6 | 0.0 | 0.0 |
| 420 | 3:1 | 3:1 | 100.0 | 5+50 | | 15.6 | 2187.1 | 0.0 | 0.0 |
| | | | | | | <u>29,721.2</u> | | | |

Frank Evans
C.E.T.
3-28-95

OH-IRM 2/15/88

US Department of Agriculture
Soil Conservation Service

PLANNED

QUANTITY CALCULATIONS

prepared for

STROTHER SWINE

in

FRANKLIN County, North Carolina

Designer : FRANK EVANS
Date : 03/28/95
Job Number 023

Checker _____
Date _____

PAD EARTH FILL

| Top dth | Left SS | Right SS | Off-CL (ft) | CL Sta | Dist (ft) | ** EXCAVATION ** | | ** FILL ** | |
|------------|------------|-------------|----------------|-----------|--------------|------------------|--------------------|----------------|--------------------|
| | | | | | | Area (SqFt) | Volume (Cu.Yds) | Area (SqFt) | Volume (Cu.Yds) |
| .20 | 3:1 | 3:1 | 100.0 | 1+50 | 50 | 0.0 | 0.0 | 82.4 | 344.3 |
| .20 | 3:1 | 3:1 | 100.0 | 2+00 | 50 | 0.0 | 0.0 | 289.5 | 866.1 |
| .20 | 3:1 | 3:1 | 100.0 | 2+50 | 50 | 0.0 | 0.0 | 274.0 | 1415.9 |
| .20 | 3:1 | 3:1 | 100.0 | 3+00 | 50 | 0.0 | 0.0 | 319.8 | 1979.5 |
| .20 | 3:1 | 3:1 | 100.0 | 3+50 | 50 | 0.0 | 890.6 | 288.9 | 2513.0 |
| .20 | 3:1 | 3:1 | 100.0 | 4+00 | 50 | 961.9 | 2301.4 | 287.3 | 3287.7 |
| .20 | 3:1 | 3:1 | 100.0 | 4+50 | 50 | 561.7 | 3025.3 | 549.4 | 4586.5 |
| .20 | 3:1 | 3:1 | 100.0 | 5+00 | 50 | 220.2 | 3245.2 | 853.3 | 6396.8 |
| .20 | 3:1 | 3:1 | 100.0 | 5+50 | 50 | 17.3 | 3261.2 | 1101.9 | 8692.3 |
| .80 | 3:1 | 3:1 | 120.0 | 6+00 | 30 | 0.0 | 3261.2 | 1377.3 | 10209.1 |
| .25 | 3:1 | 3:1 | 150.0 | 6+30 | 21 | 0.0 | 1352.9 | | |
| | | | | 6+51 | | | | | |

526.1
10,735.2
Cu. Yds.

Frank Evans
C-E-T.
3-28-95

COMPUTATION SHEET

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

| | | | | |
|---|------------------------|----------------------------------|------|--------------------|
| STATE <i>NORTH CAROLINA</i> | | PROJECT <i>STROTNER SWINE</i> | | |
| BY <i>FRANK EVANS</i> | DATE <i>3-28-95</i> | CHECKED BY | DATE | JOB NO. |
| SUBJECT <i>ESTIMATED CUT-OFF TRENCH QUANTITY</i> | | | | SHEET ____ OF ____ |

ACTUAL QUANTITY WILL DEPEND ON TYPE MATERIALS ENCOUNTERED AND SIZE OF EQUIPMENT USED - USED 10' BOTTOM AND 2:1 SIDE SLOPES IN ESTIMATE.

| STATION | ESTIMATED DEPTH | END AREA SQ. FT. | SUM OF END AREAS SQ. FT. | DISTANCE IN FEET | SECTION PRODUCTS CU. FT. | VOLUME CU. YD. | REMARKS |
|--|-----------------|------------------|--------------------------|------------------|--------------------------|----------------|----------------|
| <i>0+00</i> | <i>2.0</i> | <i>28.0</i> | | | | | |
| <i>3+60</i> | <i>3.0</i> | <i>48.0</i> | <i>76.0</i> | <i>360</i> | <i>27,360</i> | | |
| <i>5+35</i> | <i>3.0</i> | <i>48.0</i> | <i>96.0</i> | <i>175</i> | <i>16,800</i> | | |
| <i>8+50</i> | <i>2.0</i> | <i>28.0</i> | <i>76.0</i> | <i>315</i> | <i>23,940</i> | | |
| <i>9+75</i> | <i>2.0</i> | <i>28.0</i> | <i>56.0</i> | <i>125</i> | <i>7,000</i> | | |
| | | | | | <i>75,100 =</i> | <i>1391</i> | <i>Cu. Yds</i> |
| | | | | | <i>54</i> | | |
| <i>NOTE: THIS IS ESTIMATED QUANTITY FOR EXCAVATION AND EARTH FILL.</i> | | | | | | | |
| <i>Frank Evans</i> | | | | | | | |
| <i>C.E.T.</i> | | | | | | | |
| <i>3-28-95</i> | | | | | | | |

SCS-ENG-538
Rev. 5-70

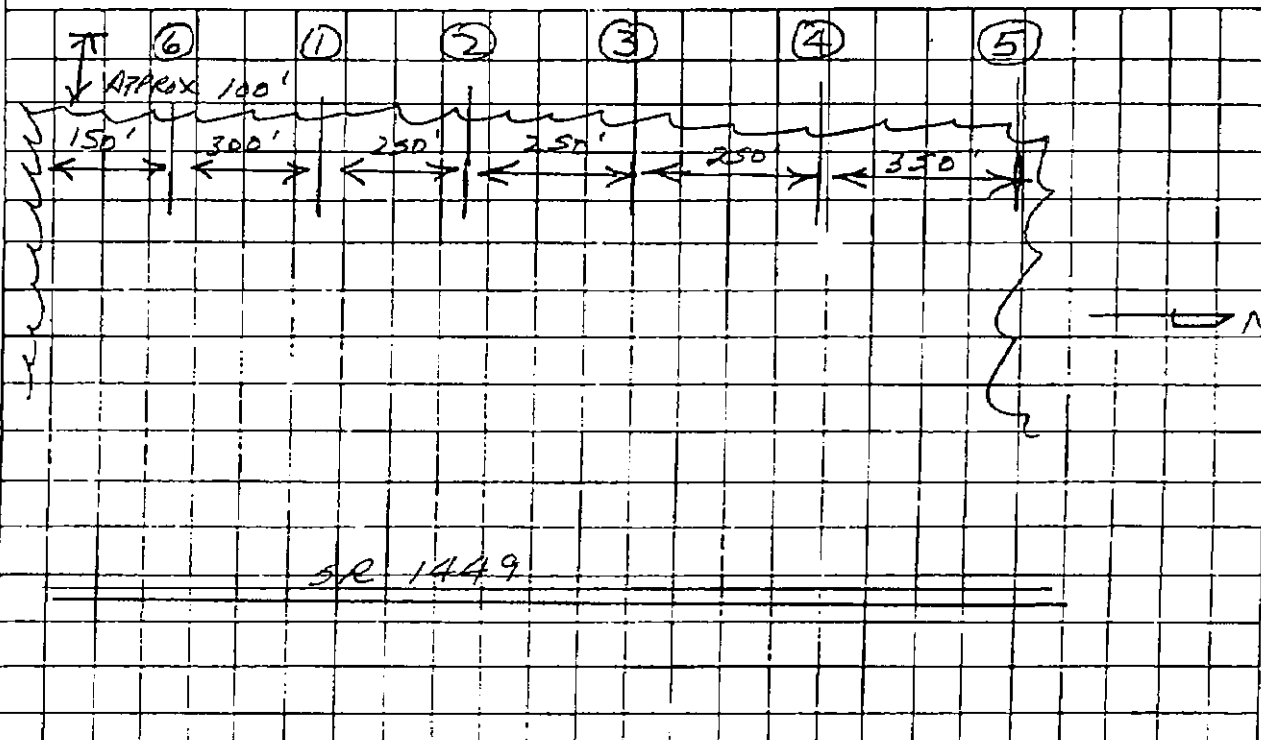
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL INVESTIGATION TO DETERMINE SUITABILITY OF PROPOSED POND SITE

FARMER'S NAME Neil Strothais DISTRICT FRANKLIN
 DATE 5-23-74 COUNTY FRANKLIN
 S. C. S. PHOTO SHEET NO. _____ WORK UNIT LOUISBURG

WATERSHED AREA MEASUREMENTS
 CROPLAND _____ ACRES PASTURE _____ ACRES 600 Sows
 WOODLAND _____ ACRES TOTAL _____ ACRES FAREW-FINCH John Parrish - Acting DC
 POND CLASS _____ WORK UNIT CONSERVATIONIST

SKETCH OF PROPOSED POND SHOWING WHERE BORINGS WERE MADE (Approx. scale 1" = _____ feet)
 Locate reference point in center line of dam and identify on sketch.



TRACK BACKHOE USED
 NO CULTURAL RESOURCES WERE OBSERVED

| SHOW DEPTH SCALE | BORING NUMBER AND PROFILE | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|
| | Make and list dam-site and spillway borings first - then ponded area and borrow pit borings - separate with vertical red line. (Continued on back where necessary) Show water table elevations on dam-site borings. | | | | | | | | | | | | | | | | | | | | | | | |
| | ① | 2 | 3 | 4 | ⑤ | 6 | 7 | 8 | ⑨ | 10 | 11 | 12 | ⑬ | 14 | 15 | 16 | ⑰ | 18 | 19 | 20 | ⑳ | 21 | 22 | 23 |
| 0-12" | SM | | 0-6" | SM | 0-12" | SM | 0-12" | SM | 0-12" | SM | 0-12" | SM | 0-12" | SM | 0-12" | SM | 0-12" | SM | 0-12" | SM | 0-12" | SM | 0-12" | SM |
| 12-128" | CL | | 6-65" | CL | 12-90" | CL | 12-96" | CL | 12-96" | CL | 12-96" | CL | 12-96" | CL | 12-96" | CL | 12-80" | CL | 12-80" | CL | 12-80" | CL | 12-80" | CL |
| 128-186" | ML | | 65-209" | ML | 90-180" | ML | 96-209" | ML | 96-209" | ML | 96-168" | ML | 96-168" | ML | 96-168" | ML | 80-180" | ML | 80-180" | ML | 80-180" | ML | 80-180" | ML |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| AG @ | 121.1 | | 130.6 | | 137.1 | | 132.8 | | | | | | | | | | | | | | | | | |
| SHWT @ | | | | | | | | | | | | | | | | | | | | | | | | |
| BOTTOM PIT @ | 105.6 | | 113.6 | | 122.1 | | 119.8 | | | | | | | | | | | | | | | | | |

BORINGS MADE BY WALLMARK-KUNICKS Evans SIGNATURE & TITLE Caund Evans, C.E.T.

SCS-ENG-538
Rev. 3-70

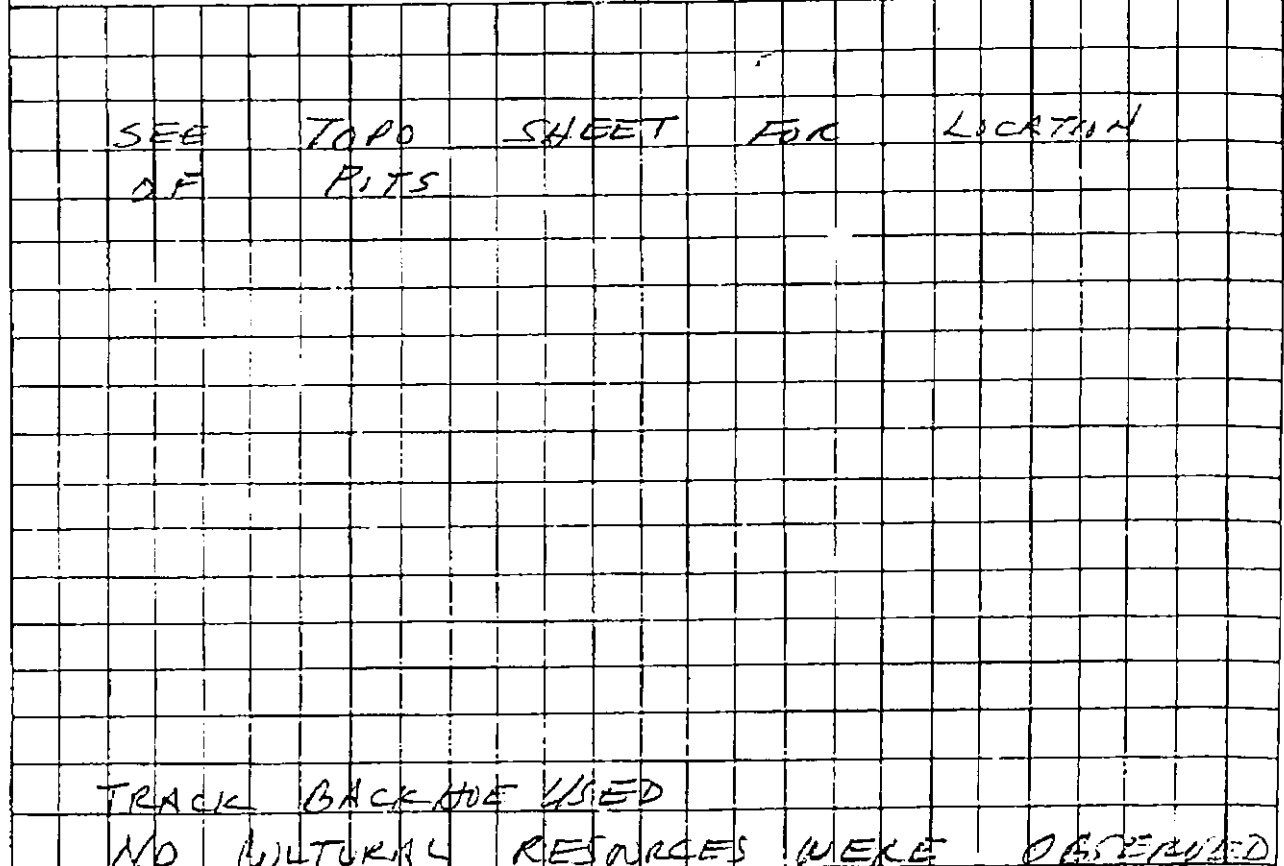
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL INVESTIGATION TO DETERMINE SUITABILITY OF PROPOSED POND SITE

FARMER'S NAME Neil Strothers DISTRICT FRANKLIN
 DATE 7-26-94 COUNTY "
 S. C. S. PHOTO SHEET NO. _____ WORK UNIT LOUISBURG

WATERSHED AREA MEASUREMENTS 600 SQ
 CROPLAND _____ ACRES PASTURE _____ ACRES Farrow Finish Kim York, D.C.
 WOODLAND _____ ACRES TOTAL _____ ACRES POND CLASS _____ WORK UNIT CONSERVATIONIST

SKETCH OF PROPOSED POND SHOWING WHERE BORINGS WERE MADE (Approx. scale 1" = _____ feet)
 Locate reference point on center line of dam and identify on sketch.



| SHOW DEPTH SCALE | BORING NUMBER AND PROFILE | | | | | | | | | | | | | | | | | | | | |
|--------------------|---|---|---|---|---|---|---|------------------------|---|----|----|----|----|----|----------------------|----|----|----|----|----|------------------------|
| | Make and list dam-site and spillway borings first; then ponded area and burrow pit borings; separate with vertical red line. (Continued on back where necessary) Show water table elevations on dam-site borings. | | | | | | | | | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
| 0-8" SM w/gravel | | | | | | | | 0-6" SM w/gravel | | | | | | | 0-4" SM w/gravel | | | | | | 0-4" SM w/gravel |
| 8-48" CL | | | | | | | | 6-38" CL | | | | | | | 4-30" CL | | | | | | 4-56" CL |
| 48-66" CL w/gravel | | | | | | | | 78-102" ML | | | | | | | 30-90" ML-Decomposed | | | | | | 56-108" ML |
| 66-120" ML | | | | | | | | 102-210" ML-Decomposed | | | | | | | 90-228" SM | | | | | | 108-140" ML-Decomposed |
| 40" = SHWT | | | | | | | | 38" = SHWT | | | | | | | 90" = SHWT | | | | | | 108" = SHWT |
| A6@ 100.1 | | | | | | | | 113.0 | | | | | | | 118.0 | | | | | | 117.0 |
| SHWT@ 96.8 | | | | | | | | 109.8 | | | | | | | 110.5 | | | | | | 110.0 |
| BOTTOM PIT@ 90.1 | | | | | | | | 95.5 | | | | | | | 99.0 | | | | | | 100.0 |

BORINGS MADE BY Hallmark-Kunicki's Evans SIGNATURE & TITLE Cons. Eng. Evans C.E.T.

BROCK GRAIN SYSTEMS
A DIVISION OF CTB, INC.
611 NORTH HIGBEE STREET
E-MAIL: brock@brockgrain.com
INTERNET: www.brockgrain.com

P.O. BOX 2000
MILFORD, IN 46542-2000
PHONE 574 658 4191
FAX 574 658 4133



7400 EAST 13TH STREET
KANSAS CITY, MO 64126
PHONE 816 968 6101
FAX 816 968 6272

1750 W. STATE ROAD 28
FRANKFORT, IN 46041-9146
PHONE 765 654 8517
FAX 765 654 8510

1/11/2012

Air permit data for Brock Commercial Tower Dryer

*** Make & model of the dryer.**

BCT7000

Manufactured by Brock Grain Systems, Frankfort, IN
Cross flow column type dryer

*** Rated capacity in BTU/Hr. and firing rate**

| | | | Natural Gas | |
|------------|----------------------|--------|-------------|--|
| 75,044,900 | max btu/hr | 75,045 | cfh | - @100% rate (200°F temp rise) |
| 43,526,000 | typical btu/hr | 43,526 | cfh | - @ 50° amb, 34°F reclaim, 200°F plenum temp |
| 66,290 | therms per 1,000,000 | | | wet bu dried |

*** Maximum through-put of grain in Tons/Hr.**

| | | | | |
|-------|-------------|-------|-----|---|
| 245.5 | dry tons/hr | 8,768 | bph | max unload rate |
| 183.8 | dry tons/hr | 6,566 | bph | typical unload rate (20-15% corn @ 200°F plenum temp) |
| 195.3 | wet tons/hr | 6,976 | bph | typical unload rate (20-15% corn @ 200°F plenum temp) |

*** Dimension of unit and exhaust height above ground.**

24 ft diameter X 121.3 ft tall
exhaust occurs between 37.1 ft & 110.7 ft above foundation

*** Dimension of exhaust vents.**

| | surface area | %open | perf openings |
|-----------------------|--------------|-------|---------------|
| .078 dia perforations | 2,337 sqft | 35.3% | 825 sqft |
| .062 dia perforations | 3,214 sqft | 25.3% | 813 sqft |
| Total area | 5,551 sqft | | 1,638 sqft |

*** Exit temperature.**

Average exhausted air temperature = 101 °F (20-15%, 50°F ambient, 200°F plenum temp.)

*** Exhaust flow (acfm) and velocity (ft/sec).**

| | | |
|---------|------------------------|--------------------------------------|
| 341,113 | acfm exhausted airflow | |
| 1.024 | ft/sec | based on exhaust surface |
| 3.470 | ft/sec | based on exhaust perforated openings |

*** Capture efficiency of screen.**

See perf size above

PM-10 method

| Model | bph | emissions .078 lbs/hr | emissions .078 lbs/hr |
|----------------|------------|----------------------------------|----------------------------------|
| .055 lb/ton | | Press cool | Suction cool |
| BCT3000 | 3,000 | | 2.93 |
| BCT3500 | 3,500 | | 3.41 |
| BCT4000 | 4,000 | | 3.90 |
| BCT4700 | 4,700 | | 4.58 |
| BCT5000 | 5,000 | | 4.88 |
| BCT6000 | 6,000 | | 5.85 |
| BCT7000 | 7,000 | | 6.83 |