ENVIRONMENTAL
LAND MANAGEMENT LLC
waste byproduct landspreading specialists

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Minneapolis, MN 55405

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www.landspread.com

Monday October 6, 2025

Theresa Stiner
Iowa Department of Natural Resources
Land Quality Bureau
502 E 9th Street
Des Moines, IA 50319-0034

RE: Smithfield Packaged Meats Corp.: Permit # 84-SDP-11-22
Permit Renewal Application

Ms. Stiner,

Attached is a permit renewal application for Smithfield Packaged Meats Corp: Permit # 84-SDP-11-22. This permit application is inclusive of three Smithfield facilities: Smithfield Sioux Center, Smithfield Orange City and Smithfield Sioux City. The facilities are in the process of acquiring the updated surety bond and that will be forwarded to you as soon as possible. All other permit renewal documents are included in this package.

If you have any questions, please do not hesitate to call.

Sincerely,

MI Klema

Michael Klema
Environmental Land Management, LLC

cc: IDNR FO #3, 1900 N Grand Ave, Ste E17, Spencer, IA 51301

Iowa Department of Natural Resources

Solid Waste Land Application Permit Application Form

Application for a solid waste land application must be accompanied by the plans, specifications and additional information required by the applicable solid waste rules under Iowa Administrative Code 567 Chapter 121.

Send completed applications with attached information to:

Iowa Department of Natural Resources
Land Quality Bureau
Solid Waste Section
502 E 9th St
Des Moines, IA 50319-0034

For questions concerning this application please contact the Department at (515) 725-8315.

☐ New Permit
☒ Permit Renewal # 84 -SDP- 11 - 22 -LAN

Section 1. Contact Information

Solid Waste Generator Name: Smithfield Packaged Meats Corp. Phone: 712-722-3675
Address: 251 15th St NE City, State, Zip: Sioux Center, IA 51250
Email: - Fax: -

Physical Location of Generating Facility:
Address: 251 15th St NE City, State, Zip: Sioux Center, IA 51250

Responsible Official Name: Nathan Frens, Plant Manager Phone: 712-722-3675
Address: 251 15th St NE City, State, Zip: Sioux Center, IA 51250
Email: nfrens@smithfield.com Fax: -

Certified Professional Agronomist Name: Jim Nesseth, Extended Ag Services Phone: 507-662-5005
Address: 507 Milwaukee St. City, State, Zip: Lakefield, MN 56150
Email: info@extendedag.com License #: 17118 Fax: 507-662-5105

Consultant Name (if any): Michael Klema, Environmental Land Management Phone: 612-353-6388
Address: 2305 Irving Avenue South City, State, Zip: Minneapolis
Email: michaelklema@landspread.com Fax: 612-284-8909

Section 2. Waste Type

Does the material to be land applied contain free liquids[1]? ☒ Yes ☐ No

If the material is a sludge, is it generated by a:

☒ Commercial or industrial wastewater treatment facility
☐ Water supply treatment facility
☐ Air pollution control facility
☐ Other; Please elaborate: _____

[1] The presence of free liquids is determined by the paint filter test. The paint filter test is done by placing a 100-milliliter or 100-gram representative sample of the material into a standard mesh number 60 (fine mesh size) conical paint filter for five minutes. Any free liquid visible below the funnel indicates sample failure.

Expected weight (tons) of solid waste to be land applied per year by the facility: 12,450 tons / 3,000,000 gallons

Section 3. Permit Application Checklist

The following items must be attached. If the permit is being renewed and there is no change from what was submitted with previous applications, the Doc Id# may be listed in lieu of resubmitting the document. Analytical results and a cost closure estimate (for facilities storing material at the application sites) must be submitted with each renewal. Checking the appropriate boxes below certifies that the documents submitted in conjunction with this application form are complete and in compliance with the applicable chapters of Iowa Administrative Code. If an application is found by the DNR to be incomplete, it may be denied and returned to the applicant.

Required Documents		Attached or Doc Id#	
Executive Summary *(permit renewals only)* • Summary of each special provision of the current permit to determine if it is to remain the same, be revised or be removed. • Summary of each permit amendment, if any, that occurred during the current permit cycle to determine if it shall be included with the renewed permit, be revised or be removed. • Provide documentation and certification as required for new permit amendment requests and new variance requests from Iowa Administrative Code, if any.			NA
Description of the material including source, quantity and method of treatment prior to land application	567 IAC 121.7(1)"a"(11)	☒	
Description of the land application process, including method of application, when application will take place, and equipment to be used	567 IAC 121.7(1)"a"(13) 567 IAC 121.7(1)"a"(14)	☒	
Analytical results	567 IAC 121.7(1)"a"(12)	☒	NA
Evidence waste application will not cause adverse effects	567 IAC 121.7(1)"a"(15) through 567 IAC 121.7(1)"a"(17)	☒	
Site Operation Plan	567 IAC 121.7(1)"a"(18)	☒	
Emergency Response and Remedial Action Plan	IAC 567 102.14	☒	
Site Closure Plan	IAC 567 102.12(10)	☒	
Proof of financial assurance and closure cost estimate (only if material will be stored at application sites)	567 IAC 121.8	☒	NA
Table of land application sites. Include the following for each application site: • Site ID • County and township • Legal description of site • Total acres in site • Acres eligible for land application • Name of landowner	567 IAC 121.7(1)"a"(4)	☒	
For each <u>new</u> application site, include the following:			
Aerial photograph with the application area(s) designated	567 IAC 121.7(1)"a"(1)	☒	NA
Soil map	567 IAC 121.7(1)"a"(2)	☒	NA
Water table levels	567 IAC 121.7(1)"a"(10)	☒	NA
Location of wells within one mile of the site	567 IAC 121.7(1)"a"(5)	☒	NA
Evidence of Natural Resources Conservation Service (NRCS) review and soil loss information	567 IAC 121.7(1)"a"(3) 567 IAC 121.7(1)"a"(6) through 567 IAC 121.7(1)"a"(8)	☒	NA
Site soil testing	567 IAC 121.7(1)"a"(9)	☒	NA
Proof of ownership or legal entitlement to use the site (agreement with the land owner)	567 IAC 121.7(1)"b"(6)	☒	NA

Section 4. Applicant Certification

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I further certify that the construction and operation of the above described facility will be in accordance with the plans, specifications, reports and related communications accepted by the Iowa Department of Natural Resources and on file in its office; and in accordance with conditions imposed in the permit issued by the Iowa Department of Natural Resources.

Signature: _____ Date: 10/06/23

Printed Name: Nathan Frens Title: Plant Manager - Sioux Center

Smithfield Packaged Meats Corp. – Sioux Center, IA
Orange City, IA, Sioux City, IA
Iowa DNR Land Application Permit Application
Application Checklist

- ## Executive Summary

1. Summary of Modifications to Facility

- There have been no modifications to the facilities.

2. Summary of Special Provisions

1. The permit holder is authorized to land apply up to 2.1 dry tons (5,000 gallons) per acre, per acre per year of sludge generated at the Smithfield Packaged Meats Corp facilities: Golden Crisp Premium Foods in Sioux Center Iowa, Premium Pet Health in Orange City Iowa, and Curley's Foods in Sioux City Iowa as indicated in the permit application dated October 10, 2022 (Document ID #104359) and the amendment request dated November 1, 2022 (Doc 104497).
2. The permit holder shall operate the site(s) in accordance with IAC 567 Chapter 121 and the approved Operations Plan dated March 22, 2022 (Document ID #104359) as submitted by Environmental Land Management. No provision in this permit or the approved site operation plan submitted constitutes a waiver or variance from 567 IAC 121 or the Code of Iowa. Any conflict between a provision of the permit or reference document and Iowa rules or statutes shall be resolved in favor of the duly adopted rules and statutes.
3. The permit holder is authorized to land apply only on DNR approved sites as shown on the attached Table 1 and the attached maps. Application will not take place on slopes greater than 9%. Application on drainage pathways where erosion would be likely to occur rainfall and snowmelt is prohibited.
4. At no time may land application occur on sites which will not normally sustain a crop or other soil-stabilizing vegetation or on land for which there is no intent to plant, cultivate and harvest a crop either the same year during the growing season or the year following land application activities. Smithfield Packaged Meats, nor the application contractor, nor the land owners are authorized to land apply wastes, or allow the application of wastes on land which will lie fallow the following growing season.
5. Land application sites shall have the pH of the surface horizon or plow layer adjusted to and maintained at or above 5.5.
6. Smithfield Packaged Meats industrial sludge must not be applied within 200 feet of occupied residences without written approval from the landowner of that residence. A 50 foot buffer must be maintained from a stream, drainange channel, waterway, tile-line surface inlet, or shoreline of a pond.
7. The permit holder is required to have a Certified Professional Agronomist perform an annual inspection of all sites utilized in the particular year to

ensure soil properties and constituents being applied are suitable and will meet agronomic rates for the crop that will be produced during that current year. The Agronomist will review soil test results to ensure that the application of the waste will not cause buildup of nutrients in the soil. The results of this inspection shall be submitted to the DNR Main Office by April 1st of each year.

8. The permit holder is required required to maintain records of the total amounts land applied at each application site. These records must be made available to the DNR upon request. An annual report summarizing the land application at each site shall be submitted to the DNR Main Office using Form 542-3276LAN. The report will be for July through June and due October 1st.
9. If applicable, Manure Management Plans must be followed to ensure compliance with Iowa manure regulations. Nutrients from Smithfield Packaged Meats sludge must be added into the rate calculations of the current Manure Management Plan.
10. Smithfield industrial sludge is hereby authorized to be stored at NE ¼ Section 8, T92N, R46W, Plymouth County and SE ¼ Section 32, T92N, R44W, Plymouth County. Storage of the Smithfield industrial sludge is subject to the following conditions:
    - The maximum amount of stored Smithfield industrial sludge must not exceed the amount that is to be land applied at the approved land application sites in Table 1. At no time will the amount stored exceed 1.36 million gallons.
    - Smithfield Packaged Meats is required to maintain records, including dates and daily volume of material hauled and deposited at the land application site on those dates to show compliance of the above requirement. Volume removed and spreading dates must also be tracked. Records must be available for inspection by the DNR upon request.
    - Odor from the stockpiling of Smithfield Packaged Meats sludge must be controlled at all times. When odor is evident, measures must be taken to remediate odor from the stockpiles. If odor of the stockpile is not remediated, the stockpile must be removed from the property and disposed of at a permitted Iowa sanitary disposal project (SDP) or hauled out of state on a schedule determined by the DNR.
11. The closure cost estimates dated July 28, 2022 in the amount of $134,500 as prepared by Thomas K. Madden, P.E., of SEH and initial proof of establishment of a financial assurance mechanism in the amount of $134,500 are hereby approved. The permit holder shall maintain surety bond #SUR0053672 dated August 9, 2022 established at Argonaut Insurance Company, Chicago IL as its financial assurance mechanism and agrees to comply with the requirement of all subrules within IAC 567 Chapter 121.8 (455B, 455D) “Financial assurance requirements for land application of wastes.”

3. Summary of Permit Amendments and New Variance Requests

- **Permit Amendments**
    1. The permit holder is authorized to land apply up to ~~1.71~~ 2.1 dry tons (5,000 gallons) per acre, per acre per year of sludge generated at the Smithfield Packaged Meats Corp facilities: Golden Crisp Premium Foods in Sioux Center Iowa, Premium Pet Health in Orange City Iowa, and Curley's Foods in Sioux City Iowa as indicated in the permit application dated October 10, 2022 (Document ID #104359) and the amendment request dated November 1, 2022 (Doc 104497)
    2. In accordance with the April 7, 2023 request submitted by Environmental Land Management, the permit holder is authorized to add the following site(s). All information submitted, including plat and soil maps (Doc# 106292), is hereby incorporated as provisions of the permit. See attached Table 1 for complete information.
        - Ken Less North
        - Langel Garfield 8
        - Langel Henry 28
    3. In accordance with the November 13, 2023 request submitted by Environmental Land Management, the permit holder is authorized to add the following site(s). All information submitted, including plat and soil maps (Doc# 108204), is hereby incorporated as provisions of the permit. See attached Table 1 for complete information.
        - Kent Allen 155
    4. In accordance with the April 4, 2024 request submitted by Environmental Land Management, the permit holder is authorized to add the following site(s). All information submitted, including plat and soil maps (Doc# 109753), is hereby incorporated as provisions of the permit. See attached Table 1 for complete information.
        - Vandershaaf
    5. In accordance with the November 5, 2024 request submitted by Environmental Land Management, the permit holder is authorized to add the following site(s). All information submitted, including plat and soil maps (Doc# 111257), is hereby incorporated as provisions of the permit. See attached Table 1 for complete information.
        - Site 11 Krienert Home
    6. In accordance with the December 18, 2024 request submitted by Environmental Land Management, the permit holder is authorized to add the following site(s). All information submitted, including plat and soil maps (Doc# 111518), is hereby incorporated as provisions of the permit. See attached Table 1 for complete information.
        - Tentingers

- **New Variance Requests**
    1. Request to include additional land application site included in the permit renewal application. Site has been added to Table 1 and all mapping and information included in the application. Site name:
        - Weidauer Home
    2. Request to include all storage locations from the engineer's closure cost estimate including maximum storage volume of 2,720,000:
        - NE ¼ Section 8, T92N, R46W, Plymouth County – 1,200,000 gallons
        - SE ¼ Section 28, T91N, R43W, Plymouth County – 830,000 gallons
        - SE ¼ Section 32, T92N, R44W, Plymouth County – 160,000 gallons
        - SE ¼ Section 18, T92N, R45W, Plymouth County – 525,000 gallons

▪ Description of Material

Smithfield Sioux Center Wastewater Process:

All plant water that goes down the drain (sanitation water and daily production water) goes to the wastewater influent pit. The water is pumped into a rotary screener that removes the solids (these solids fall into a roll off tub that is taken to the landfill) and the water is gravity fed into PIT 1, the PIT then pumps into the EQ tank (Equalization Tank).

The water is pumped out of the EQ tank into the DAF1 (Dissolved Air Flotation) unit where chemicals (a GRAS approved flocculent and coagulant are added to the water) removing Fats, Oil and Grease (FOG) along with some solids. The solids float to the top of the water in DAF1 where it is scraped off and pumped to a holding tank. These solids are pumped from holding tank into a tanker truck and hauled off site.

The remaining water and solids flows into the MBBR (Moving Bed Biochemical Reactor). From the MBBR the remaining solids and deactivated sludge flows into DAF2 where they mix with a flocculent. The cleaned water is then sent to the city of Sioux Center. The solids float to the top of the water in DAF2 where it is scraped off and pumped to a holding tank. These solids are pumped from holding tank into a tanker truck and hauled off site.

Smithfield Orange City Wastewater Process:

All plant water that goes down the drain (sanitation water and daily production water) goes to the wastewater influent pit. The water is pumped into a screener that removes the solids (these solids fall into a roll off tub that is taken to the landfill) and the water is transferred into the EQ tank (Equalization Tank). The water is pumped out of the EQ tank to the DAF (Dissolved Air Flotation) unit where chemicals (a GRAS approved flocculent and coagulant are added to the water) remove the remaining solids from the water as it

flows through the unit. The solids float to the top of the water in the DAF where it is scraped off and pumped to a holding tank. These solids are pumped from holding tank into a tanker truck and hauled off site.

Smithfield Sioux City Wastewater Process:

All plant water that goes down the drain (sanitation water and daily production water) goes to the wastewater influent pit. The water is pumped into a screener that removes the solids (these solids fall into a roll off tub that is taken to the landfill) and the water is pumped into the EQ tank (Equalization Tank). The water is pumped out of the EQ tank to the DAF (Dissolved Air Flotation) unit where chemicals (a GRAS approved flocculent and coagulant are added to the water) remove the remaining solids from the water as it flows through the unit. The solids float to the top of the water in the DAF where it is scraped off and pumped to a holding tank. These solids are pumped from holding tank into a tanker truck and hauled off site.

▪ Description of the Disposal Process and Equipment

Phil Krienert will perform the hauling as well as the land application work. Typical hauling will consist of approximately 14 loads per week out of the three facilities using semi and tanker trailer, at roughly 5,000-7,000 gallons of material per load. Material will be hauled to a storage lagoon or tank until seasonal limitations allow application (cropping season, winter). The maximum stockpile will be approximately 2,720,000 gallons, as described in the Closure Cost Estimate by Tom Madden, PE of SEH. After seasonal limitations, the material will be land applied and injected to the field site using a pull-type rear liquid manure applicator at appropriate agronomic rates as recommended by Extended Ag Services.

▪ Analytical Results

Attached are the most recent analytical results from Midwest Labs. Also attached is an agronomist's recommendation of that analysis performed by Extended Ag Services.

▪ Evidence That Waste Application Will Not Cause Adverse Affects

The industrial sludge does not contain any toxic materials. Proper land application processes will be adhered to in order to minimize any chance of adverse affects. To reduce the chance of runoff, land application will be suspended when precipitation is imminent or during other adverse weather conditions. All specific setbacks will be adhered to during storage and application operations. Recommended application rates will be followed and adjusted according to the agronomic limits of the particular sites. Cumulative metal loading rates have been analyzed in the agronomist recommendations. Therefore, no adverse affects are anticipated from the land application program.

- **Site Operation Plan**

See attached Operation Plan.

- **Emergency Response and Remedial Action Plan (ERRAP)**

See attached ERRAP.

- **Site Closure Plan**

During the life of a specific site, setbacks and application rates guidelines will be followed. By applying the material at appropriate agronomic rates the crops will utilize the nutrients within a year or shortly thereafter as it breaks down and no over fertilization will occur. However, upon the closing of a site, the Department will be notified in writing. If the site is deemed compromised it will be monitored and any corrective measures to return that site normalcy will be detailed to the Department.

- **Proof of Financial Assurance and Closure Cost Estimate**

Thomas Madden, P.E., of SEH in Mason City, IA has completed the closure cost estimate attached with the permit renewal application. Smithfield will be providing proof of financial assurance by way of surety bond for the updated closure cost estimate amounts.

- **Table of Land Application Sites (Table 1)**

See attached Table 1 for site specific information.

- **Site Maps and Aerial Photographs**

See all submitted site maps for all sites listed on Table 1.

- **Soil Maps**

See all submitted soil maps for permitted sites on Table 1.

- **Site Water Table Levels**

Site water table level information has been attached to this permit application for all sites on Table 1.

- **Well Specifications**

An Iowa DNR well search has been completed for all sites on Table 1 and is attached to this permit application.

- **Evidence of NRCS Review & Soil Loss Information**

Jim Nesseth, Certified Professional Agronomist, along with Andrew Nesseth, Environmental Consultant, of Extended Ag Services, have reviewed the site information and have summarized their findings in a review attached to this permit application. Soil loss mapping information for all sites on Table 1 has also been attached to this permit application.

- **Site(s) Soil Testing**

Initial site soil sampling will be completed for all sites on Table 1 in which application will take place for the upcoming cropping season. Soil test results will be further examined and discussed for sites applied to in the annual agronomist report.

- **Proof of Ownership/Local Zoning Requirements**

See Table 1 identifying farmers and land operators. Also attached are the signed contractual consent forms for each individual.

Midwest Laboratories
13611 B Street
Omaha, NE 68144
P 402-334-7770
F 402-334-9121

ENVIRONMENTAL LAND MGMT LLC - 16041
PO BOX 50004
MINNEAPOLIS, MN 55405

Project: Golden Crisp/Prem Pet Health

Project Manager: LEE HANSEN

Reported:
2025-06-12 08:26

Sample ID: Industrial Sludge
Laboratory ID: 1615982-01
Sampled Date/Time: 2025-05-15 17:00

Analyte	Result	Qualifier	MDL	Reporting Limit	Units	Method	Prepared	Analyzed	Analyst/ Container
Total Metals									
Arsenic	<			5.5	mg/kg dry	EPA 6020	2025-05-22	2025-05-28	nto7 / (C)
Barium	7.0			2.7	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Cadmium	<			1.1	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Calcium	8003			137.3	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Chromium	13.4			5.5	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Copper	17.5			5.5	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Iron	456.9			54.9	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Lead	<			27.5	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Magnesium	1393			54.9	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Manganese	20.2			5.5	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Mercury	<			0.41	mg/kg dry	EPA 7471	2025-05-22	2025-05-30	mab7 / (C)
Molybdenum	<			5.5	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Nickel	5.6			5.5	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Phosphate (P2O5)	27040			125.8	mg/kg dry	Calculation	2025-05-23	2025-05-27	erw9
Phosphorus	11810			54.9	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Potash (K2O)	7876			131.8	mg/kg dry	Calculation	2025-05-23	2025-05-27	erw9
Potassium	6564			109.9	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Selenium	<			5.5	mg/kg dry	EPA 6020	2025-05-22	2025-05-28	nto7 / (C)
Silver	<			5.5	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Sodium	20030			109.9	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Sulfur	2458			80.1	mg/kg dry	EPA 6010D	2025-06-04	2025-06-05	erw9 / (C)

Work Order: 1615982

The result(s) issued on this report only reflect the analysis of the sample(s) submitted. For applicable test parameters, Midwest Laboratories is in compliance with NELAC requirements. Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced in whole or in part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.

Midwest Laboratories
13611 B Street
Omaha, NE 68144
P 402-334-7770
F 402-334-9121

ENVIRONMENTAL LAND MGMT LLC - 16041
PO BOX 50004
MINNEAPOLIS, MN 55405

Project: Golden Crisp/Prem Pet Health

Project Manager: LEE HANSEN

Reported:
2025-06-12 08:26

Sample ID: Industrial Sludge
Laboratory ID: 1615982-01
Sampled Date/Time: 2025-05-15 17:00

Analyte	Result	Qualifier	MDL	Reporting Limit	Units	Method	Prepared	Analyzed	Analyst/ Container
Total Metals									
Zinc	117.9			11.0	mg/kg dry	EPA 6010D	2025-05-23	2025-05-27	erw9 / (C)
Environmental Chemistry									
Ammonia-N	25200			165	mg/kg dry	SM 4500-NH3 C-2021	2025-05-22	2025-05-22	pes0 / (B)
Chloride	20700			826	mg/kg dry	SM 4500-Cl- E-2021	2025-05-27	2025-05-27	kjp4 / (A)
Hexane Extractable Material (HEM)	825000			13200	mg/kg dry	EPA 9071B	2025-05-28	2025-05-28	atk5 / (A)
Total Kjeldahl Nitrogen	43500			826	mg/kg dry	PAI-DK 01	2025-05-22	2025-05-22	pes0 / (B)
Nitrate/Nitrite Nitrogen	<			3.3	mg/kg dry	EPA 353.2	2025-05-23	2025-05-23	NAM7 / (A)
Organic Nitrogen	18300			826	mg/kg dry	Calculation	2025-05-22	2025-05-22	pes0
pH @ 19.1°C	5.75				S.U.	EPA 9045D	2025-05-22	2025-05-22	ppj2 / (A)
Percent Solids	6.05			0.01	%	SM 2540 G-2015	2025-05-21	2025-05-23	kpl8 / (A)
Percent Volatile Solids	88.96			0.01	%	SM 2540 G-2015	2025-05-21	2025-05-23	kpl8 / (A)
Total Carbon	77.23			1.65	% dry	ASTM D5373-08(mod)	2025-05-22	2025-05-22	krg0 / (B)

Work Order: 1615982

The result(s) issued on this report only reflect the analysis of the sample(s) submitted. For applicable test parameters, Midwest Laboratories is in compliance with NELAC requirements. Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced in whole or in part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.

EXTended Ag Services, Inc.

202 South Highway 86
Lakefield, MN 56150
507.662.5005 phone
507.662.5105 fax
info@extendedag.com

September 24, 2025

Environmental Land Management

1602 11th Drive NE

Austin, MN 55912

RE: Smithfield Sioux Center & Smithfield Orange City (formerly Golden Crisp Foods and Premium Pet Health) By-product review

We have completed your request to review the liquid by-product(s) for Smithfield Sioux Center & Smithfield Orange City. The extent of our review focused on ten (10) samples taken from October 2021 through June 2025.

The extent of this review focused on those constituents pertinent to human health, crop production and agronomic value. It is our understanding that the combined by-product from the two Smithfield facilities is combined with a third waste stream. This review reflects this change and the updated testing and shall constitute our opinions on the by-products in their entirety. The analysis from Midwest and Minnesota Valley Testing Laboratory(s) indicates that the product will be handled as a liquid material at approximately 9.2% solids. The test results indicated a total Nitrogen content, measuring 26.9 lbs. per 1,000 gallons. The measured Phosphorus, reported as P2O5, was approximately 6.1 lbs. per 1,000 gallons and the Potassium, reported as K2O, was measured at 3.3 lbs. per 1,000 gallons. Lastly, Sodium was reported to be about 9.9 lbs. per 1,000 gallons.

Nutrient availability depends on application methods and environmental conditions (soil pH, temperature and precipitation). Estimates for nutrient availability are historically derived from research conducted by the Land Grant college system. Little research exists on the typical nutrient availability of biosolids. However, due to the similarity in how nutrients become available through mineralization in the soil, using crop available nutrient estimates for liquid manure is acceptable. The University of Nebraska and Iowa State University are used as references for estimating plant available nutrients for the Smithfield by-product.

We would expect 70-80% of the Phosphorus to immediately available for plant use and 70-90% of the Potassium to be available in the first year.

Determining nitrogen availability is complex. The sooner the material is incorporated into the soil the profile, the higher the expected plant available nitrogen (other nutrient availabilities will remain the same). Ammonium Nitrogen (NH4+) in the byproduct will be protected from volatilization by assimilating it with negatively charged clay particles in the soil profile. However, the Organic Nitrogen availability is subject to environmental conditions that influence its conversion to Ammonium Nitrogen or Nitrate (NO3-), namely soil temperature, soil moisture, aeration, drainage management and microbial activity. Iowa State University and University of Nebraska-Lincoln estimate that approximately 30-35% of the organic nitrogen in the by-product will be plant available in year one. Due to the ratio of Ammonium Nitrogen and Organic Nitrogen in the material, a conservative estimate of total Nitrogen availability – if incorporated within 24 hours – would be *approximately* 60% in the first year.

Sodium applications should be limited to less than 170 lbs. per year to avoid toxicity issues (9.9 lbs. per 1,000 gallons was measured). Sodium loading must be managed to preclude a reduction in infiltration (surface crusting), dispersion and migration of clay particles into soil pores, swelling of expandable clays, and a reduced ability of a cover crop to take up water. Sodium is considered de-stabilizing with respect to soil structure. The sodium adsorption ratio (SAR) is the ratio between sodium, and calcium plus magnesium in the effluent. For fine to medium textured soils, a SAR above 8.5 in the effluent can negatively affect the soil structure and/or infiltration rates of the soil. In these instances, calcium and magnesium (gypsum) should be added to reduce the SAR. An evaluation of this material indicates an adjusted SAR value of 10.1 on an as-received basis. In addition, the electrical conductivity of the soils should be monitored to maintain less than 4 mmhoms/cm. If land applications follow recommendations by appropriately managing frequency and rate of application, no sodium issues are likely.

The density of Nitrogen is the limiting factor in determining the application rate. Our recommendation of this material is to land apply it at a rate of approximately 5,470 gallons per acre with immediate incorporation. This translates to approximately 2.1 dry tons per acre. A first-year plant available analysis of 84 – 61 – 20 lbs. /acre (N-P2O5-K2O) can be expected based on this rate. An estimated 35% of the total organic nitrogen and 80% of the ammonia nitrogen applied will be available to plants in the first year. If the material is applied at the same rate without incorporating within 48 hours, we estimate plant availability at of 62 – 61 – 20 lbs. /acre (35% of organic and 50% ammonia nitrogen). We estimate that 25% of the total organic nitrogen will be available to plants in the 2nd year following application and 15% would be available in the 3rd year following any application. The remaining amount would be lost to volatilization or leaching. If applications will be made in successive years, proper crediting of residual nitrogen should be employed based on crop removal, application rate, timing and total pounds applied.

This recommended application rate will supply a significant portion of the Nitrogen of non-legume crop needs (depending on actual Nitrogen mineralization rates). Therefore, nitrogen from other sources should be managed accordingly. If the land application site has soil tests exceeding the very high range for phosphorus, applications at the recommended rate should be limited to once every two years. Fields

with Phosphorus soil tests below the very high range can be applied at an annual basis if crop yields warrant it. Based on the analysis, the land application rate will not exceed the cumulative loading rates outlined in the Region VIII EPA's Biosolids Management Handbook for determining compliance with 40 CFR Part 503.

The material has a favorable nutrient density and as such, it can be utilized on a wide range of soils but should be targeted on soils testing in the very low to Optimum range for Phosphorus when planning annual land applications to achieve the greatest agronomic benefit. Supplemental phosphorus applications should follow Iowa State University Guidelines in PM 1688. Adequate soil conservation measures should be utilized to prevent phosphorus movement offsite in addition to following allow required setbacks and best management practices for application. Regular soil testing should be conducted following applications to monitor changes in soil characteristics.

This review is independent of any restrictions pertinent to specific field conditions (slope, erosion potential, etc.) and should be considered as such. Specific conditions in each land application site may require lower application rates to protect the public health, safety and welfare. Please refer to any land application site reviews for further recommended land application restrictions.

This product has the potential to provide significant agronomic benefit to landowners. Please feel free to contact us with any questions or concerns. Thank you for the opportunity to provide our input on your Project.

Sincerely,

Jim Nesseth

Certified Agronomist/CCA
License#: 17118

Andrew Nesseth

Environmental Consultant

Smithfield Packaged Meats Corp. – Sioux Center, IA
Orange City, IA, Sioux City, IA

Land Application Site Operation Plan

October 3, 2025

Land Application Permit Application Checklist Item 'P'
IDNR 567, Chapter 121.7(1)

a. Operation Plan Outline

1) See submitted aerial maps and well search maps.
2) See submitted soil maps.
3) See submitted reviews of sites.
4) See submitted master site list table for site acres.
5) See submitted well search reports.
6) See submitted soil map tables and reviews.
7) See submitted soil map tables and reviews.
8) See submitted soil map tables and reviews.
9) Site soil sampling will be completed at each specific site used for land application in a season. Soil data will be analyzed and discussed in the annual agronomist reports.
10) See submitted soil map tables.
11) See attached Permit Application form, and Application Checklist: Description of Material.
12) See attached analysis report from Midwest Labs.
13) See attached Permit Application form, Application Checklist: Description of Disposal Process and Equipment, and byproduct review from Extended Ag Services.
14) See attached Permit Application form, Application Checklist: Description of Disposal Process and Equipment, and byproduct review from Extended Ag Services.
15) See byproduct review by Extended Ag Services. Annual agronomist reports will discuss site soil information.
16) See byproduct review by Extended Ag Services. See analytics from Midwest Labs.
17) See submitted aerial and soil maps along with land application site reviews.
18) **Operational requirements of 121.7(1) "c" & "d".**
    c. Operating requirements for land application sites
        1) The general public and livestock will not be given access to the land application sites for two months after application.

2) Land application sites will be soil tested and those results will be analyzed and discussed by the agronomist in the annual agronomist report.
3) Land application will cease prior to a rain event or other runoff possibility.
4) Land application sites will not be used when frozen or snow covered conditions prohibit unless precautions are taken to avoid runoff.
5) If the department requires, a groundwater-monitoring program could be implemented.
6) In the event of significant leachate, the department will be notified and a plan for controlling that leachate will be submitted.
7) Sludge sampling will be performed annually at a minimum for all constituents required by the permit application. Additional sampling will be done as necessary.
8) All site application records will be maintained and submitted to the department on quarterly report forms and will be discussed further on annual agronomist reports.
9) If sites are no longer in use, the department will be notified to remove them from the Table 1.
10) If the department requires, closed sites will be monitored.

d. Additional operating requirements for land application. If any of the following additional operating items are required by the department, all efforts will be made to comply with those requests:
   1) Telephone on site.
   2) Sanitary facilities on site.
   3) Fence to control access to site.
   4) Permit copy on site.
   5) Signage containing name, permit number, closed to public and the owner's name and phone number.

Emergency Response and Remedial Action Plan for Smithfield Packaged Meats Corp. – Sioux Center, IA Orange City, IA, Sioux City, IA Prepared by: Environmental Land Management

A. Facility Information

***Permitted Agency**:* Smithfield Packaged Meats Corp., Sioux Center, IA, Orange City, IA, Sioux City, IA

***DNR Permit Number**:* 84-SDP-11-22P-LAN

***Facility Description**:* Phil Krienert will land apply industrial sludge generated by Smithfield Packaged Meats Corp. in Sioux Center, IA, Orange City, IA, and Sioux City, IA. Land application site locations are on agricultural land in Plymouth County.

Responsible Official and Contact Information:
Nathan Frens, Smithfield Sioux Center: 712-722-3675
Jamie Maxwell, Smithfield Sioux Center: 712-722-3675
Jeremy Schatz, Smithfield Orange City: 712-737-5726
Erik Kafka, Smithfield Sioux City: 712-224-2384
Phil Krienert: 712-540-3197

***Project Location*:** Land application sites in Plymouth, IA.

***Site and Environs Map**:* See submitted maps for permitted sites listed on Table 1.

B. Regulatory Requirements: Smithfield in Sioux Center, IA, Orange City, IA, and Sioux City, IA are seeking to acquire a permit to operate an industrial sludge land application project at different spreading sites in Iowa in accordance with Chapter 455B of the code. This ERRAP has been developed by Environmental Land Management (ELM) and is being submitted with other permit application documentation.

C. Emergency Conditions – Response and Remedial Action

1. Failure of Utilities: During the land application process, there is no reliance upon natural gas, liquid propane or electricity. All of the trucks and application equipment operate on gas or diesel engines.

2. Weather Related Events: In the case of violent weather or a natural disaster event (tornado, flood, intense rainfall), delivery of the material to land application sites would cease for the duration of the event and no land application would take place during such an event. Stored material should not be affected by tornado or wind events due to in-ground or covered storage. Storage will not take place in flood

zones. In all weather conditions and events land application or delivery can be discontinued until conditions improve or the event is over.

3. **Fire and Explosions**: The by-products are not known to have any history of catching on fire or exploding and they do not contain anything flammable or toxic. All trucks are equipped with fire extinguishers and radios/cell phones to summon assistance. If there was a disabled vehicle on the road, the truck can be towed back to the facility where the by-product can be transferred to a working vehicle. There are no fuels or utilities associated with this waste material. The material is loaded and unloaded outside and all working areas are outside, there are no indoor facilities associated. The by-product is cool when it leaves the production site and there are no gases associated with the by-products. There are no buildings associated with the transportation or stockpiling of this material so there are no evacuation procedures.

4. **Regulated Waste Spills and Releases:** The by-product materials consists of DAF sludge. All stored material will be contained within the storage lagoon or tank. There are no gases associated with theses by-products. It will be transported daily in a semi and tanker trailer and stored on approved land for storage until seasonal conditions allow for land application. There is no litter or airborne particulates associated with this material. There are no drainage systems associated with the land application sites. If an off-site release occurred during transport, equipment and personnel would need to be notified for clean up and transfer. The IDNR spill response team as well as Smithfield personnel will be notified in a timely manner.

5. **Hazardous Material Spills and Releases:** The by-products are not hazardous.

6. **Mass Movement of Land and Waste:** In the event of an earthquake, delivery would be ceased until conditions normalized. An earthquake should not affect an existing stockpile. Slope failure should not affect a stockpile of material due to the limitation of a stockpile being on a slope of 9% or less. If waste were to shift or subside due to an earthquake, slope failure, sinkhole, etc., machinery (excavators, loaders, or bulldozer) can be employed to recapture any material shifted.

7. **Emergency and Release Notifications and Reporting**:
   Nathan Frens, Smithfield Sioux Center: 712-722-3675
   Jamie Maxwell, Smithfield Sioux Center: 712-722-3675
   Jeremy Schatz, Smithfield Orange City: 712-737-5726
   Erik Kafka, Smithfield Sioux City: 712-224-2384
   Phil Krienert: 712-540-3197
   Michael Klema, ELM: 203-506-1814
   Local Fire Department: 911
   Local Police Department: 911
   Theresa Stiner, Iowa DNR: 515-725-8315
   Iowa DNR Office #3: 712-262-4177
   Iowa DNR Spill Response: Tel. 515-725-8694

Iowa DNR Spill Response notification due within 6 hours of spill/release
Iowa DNR Spill Report due within 30 days of spill/release

8. Emergency Waste Management Procedures: All transportation machinery is equipped with radios and/or operator cell phones and can immediately make contact for assistance in an emergency. Deliveries to land application sites can be ceased at any time if necessary or wastes can be diverted to secondary options.

9. Primary Emergency Equipment Inventory: The trucks are equipped with communication devices, first aid and fire extinguishers. Other water sources and hydrants will be available in certain locations.

10. Emergency Aid: Truck and machinery operators are equipped with communication devices if emergency aid is needed. In a medical emergency local emergency services would be contacted through 911.

11. ERRAP Training Requirements: Annual ERRAP training will be provided to personnel involved in the hauling and land application activities by ELM management and attendees will be recorded. Training will include proper handling of the byproduct from the plant to the eventual land application site as well as emergency operations.

12. Reference Tables, Figures and Maps: Table 1 maps show the locations of the sites. Primary contacts are listed in the "Emergency and Release Notifications and Reporting".

Building a Better World
for All of Us®

September 15, 2025

RE: Environmental Land Management
Engineer's Opinion of Probable Cost For
Industrial Sludge By-Product Disposal Land
Application Project – Smithfield Foods:
- Golden Crisp Premium Foods
  Sioux Center, Iowa
- Premium Pet Health
  Orange City, Iowa
- Curley's Foods
  Sioux City, Iowa

Theresa Stiner
IDNR Land QUality Bureau
6200 Park Ave.
Suite 200
Des Moines, Iowa 50321

Dear Ms. Stiner:

The following engineer's estimate is to be used for the basis of financial assurance as required in IAC 567-121.8. The costs detailed below are based on a third-party land application of stored solid waste due to the permit holders failure to properly land apply wastes in accordance with 567-121.7. We have taken into consideration location, materials and the volume of storage available based on the information provided by Environmental Land Management.

The Smithfield Foods facilities that this correspondence covers are:
- Golden Crisp Premium Foods
  Sioux Center, Iowa
- Premium Pet Health
  Orange City, Iowa
- Curley's Foods
  Sioux City, Iowa

The byproduct from these facilities is a liquid material as described in the attached Exhibit A. The material is stored at 4 storage facilities as follows:
- Primary location – NE ¼ Section 8, T92N, R46W, Plymouth County – 1.2 million gallons
- Primary location #2 – SE ¼ Section 28, T91N, R43W, Plymouth County – 830,000 gallons
- Secondary location – SE ¼ Section 32, T92N, R44W, Plymouth County – 160,000 gallons
- Secondary location #2 – SE ¼ Section 18, T92N, R45W, Plymouth County – 525,000 gallons

The maximum estimated storage volume of material is practically limited to the volume of the storage tanks, for a total of 2.72 MG. The typical land application procedure consists of liquid land application (injection) to the application sites within an approximate radius of 2 miles from each storage site, all in Plymouth County. Application occurs after harvest.

Based on the production volume and the reporting and auditing requirements, it seems unlikely that vast amounts of material could accumulate without intervention. It is reasonable to assume that it is possible for all storage tanks to become full and require disposal. The following opinion of cost is based on the information above, and the notes on the following page:

Engineer's Estimate of Probable Cost

Item	Quantity	Cost	Total
Mobilization[1]	1 LS	$30,000	$ 30,000
Material Application[2]	2.72 MG	$0.11/gal	$299,200
Management[3]	1 LS	$8,000	$ 8,000
TOTAL			$337,200

[1] Mobilization includes all costs associated with transportation of equipment, material and workers to multiple sites. Costs also include obtaining land, easements and soil tests necessary for application.
[2] Application includes pumping and drag line application costs are based on information submitted by contract liquid applicators.
[3] Management includes all reporting requirements.

Please call if you have any questions.

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.

Thomas K. Madden, PE
Project Engineer

c: Mike Klema, Environmental Land Management, 1602 – 11th Drive NE, Austin, MN 55512

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Iowa.

Thomas K. Madden, PE 9/15/2025 (Date)

My License renewal date is: December 31, 2026
License Number: P15573
Responsible for the following sections:
All sections

Exhibit A

Golden Crisp Premium Foods (Smithfield) Sioux Center Wastewater Process:

All plant water that goes down the drain (sanitation water and daily production water) goes to the wastewater influent pit. The water is pumped into a rotary screener that removes the solids (these solids fall into a roll off tub that is taken to the landfill) and the water is gravity fed into PIT 1, the PIT then pumps into the EQ tank (Equalization Tank).

The water is pumped out of the EQ tank into the DAF1 (Dissolved Air Flotation) unit where chemicals (a GRAS approved flocculent and coagulant are added to the water) removing Fats, Oil and Grease (FOG) along with some solids. The solids float to the top of the water in DAF1 where it is scraped off and pumped to a holding tank. These solids are pumped from holding tank into a tanker truck and hauled off site.

The remaining water and solids flows into the MBBR (Moving Bed Biochemical Reactor). From the MBBR the remaining solids and deactivated sludge flows into DAF2 where they mix with a flocculent. The cleaned water is then sent to the city of Sioux Center. The solids float (from DAF2) to the top of the water and it is scraped off and pumped to a holding tank. The solids float to the top of the water in DAF2 where it is scraped off and pumped to a holding tank. These solids are pumped from holding tank into a tanker truck and hauled off site.

Premium Pet Health (Smithfield) Orange City Wastewater Process:

All plant water that goes down the drain (sanitation water and daily production water) goes to the wastewater influent pit. The water is pumped into a screener that removes the solids (these solids fall into a roll off tub that is taken to the landfill) and the water is transferred into the EQ tank (Equalization Tank). The water is pumped out of the EQ tank to the DAF (Dissolved Air Flotation) unit where chemicals (a GRAS approved flocculent and coagulant are added to the water) remove the remaining solids from the water as it flows through the unit. The solids float to the top of the water in the DAF where it is scraped off and pumped to a holding tank. These solids are pumped from holding tank into a tanker truck and hauled off site.

Curly's Foods (Smithfield) Sioux City Wastewater Process:

All plant water that goes down the drain (sanitation water and daily production water) goes to the wastewater influent pit. The water is pumped into a screener that removes the solids (these solids fall into a roll off tub that is taken to the landfill) and the water is pumped into the EQ tank (Equalization Tank). The water is pumped out of the EQ tank to the DAF (Dissolved Air Flotation) unit where chemicals (a GRAS approved flocculent and coagulant are added to the water) remove the remaining solids from the water as it flows through the unit. The solids float to the top of the water in the DAF where it is scraped off and pumped to a holding tank. These solids are pumped from holding tank into a tanker truck and hauled off site.

Smithfield Master Site List (Table 1): Permit 84-SDP-11-22

Site Name	Farmer	Landowner	County	Township	T, R	Section	Section Description	Total Acres	Acceptable Land Application Acres
Ken Less Home	Ken Less	Ken Less	Plymouth	Johnson	T92N, R47W	32, 33	N 1/2 SE 1/4 Sec 32, NW 1/4 SW 1/4 Sec 33	100	80
Site 10 Krienert	Stan Krienert	Stan Krienert	Plymouth	Washington	T92N, R46W	8	NE 1/4	154	140
Site 11 Krienert Home	Dan Langel	Dan Langel / Phil Krienert	Plymouth	America	T92N, R45W	18	E 1/2 of SW 1/4, SE 1/4, SE 1/4 of NE 1/4	200	190
Site 12 Krienert	Phil Krienert	Phil Krienert	Plymouth	Washington	T92N, R46W	5	S 1/2 of NW 1/4	57	48
Site 13 Krienert	Ed Krienert	Arlene Boysen Trust	Plymouth	Washington	T92N, R46W	9	NW 1/4	156	156
Site 14 Krienert	Ed Krienert	Ed Krienert	Plymouth	Grant	T93N, R46W	21	S 1/2 NW 1/4, SW 1/4, W 1/2 SE 1/4	275	176
Site 17 Krienert	Ken Krienert	Ken Krienert	Plymouth	Washington	T92N, R46W	8	N1/2 of NW 1/4	66	66
Site 18 Krienert	Ed Krienert	Julie Bell	Plymouth	Grant	T93N, R46W	31, 32	S 1/2 of SE 1/4 Sec 31; S 1/2 of SW 1/4 Sec 32	153	153
Ken Less North	Ken Less	Greg Brown	Plymouth	Johnson	T92N, R47W	33	SW 1/4 of NW 1/4	53	53
Langel Garfield 8	Cole Langel	Dan & Cole Langel	Plymouth	Garfield	T90N, R43W	8	E 1/2	315	315
Langel Henry 28	Dan Langel	D&JL LLC	Plymouth	Henry	T91N, R43W	28	S 1/2 of NW 1/4, N 1/2 of SW 1/4, SE 1/4	309	266
Kent Allen 155	Kent Allen	Sue Ann Wilms Trust	Plymouth	Johnson	T92N, R47W	32	SW 1/4	155	103
Tentingers	Jim Tentinger	GMT Properties	Plymouth	Johnson	T92N, R47W	32	NE 1/4 & E 1/2 of NW 1/4	185	173
Vanderschaaf	Wally Vanderschaaf	Jacob Griend & Jeanette Vande Trust	Sioux	Holland	T95N, R44W	5	SE 1/4	140	140
Weidauer Home	Jeff Weidauer	Jeff Weidauer	Plymouth	America	T92N, R45W	19	E 1/2 of NW 1/4 and W 1/2 of NE 1/4	112	112

Farmer Information

Name	Phone	Address	City	State
Philip Krienert	712-540-3197	18493 Lake Ave	Le Mars	IA
Ed Krienert	712-533-6125	13328 Iris Ave	Le Mars	IA
Ken Less	712-548-8623	21601 Fir Ave	Merrill	IA
Ken Krienert	712-533-6400	PO Box 116	Brunsville	IA
Dan Langel	712-540-9956	35855 C-38	Le Mars	IA
Cole Langel	712-540-9253	20921 Nature Ave	Le Mars	IA
Kent Allen	712-548-6080	21448 190th St	Arkon	IA
Wally Vanderschaaf	712-395-1726	PO Box 213	Sioux Center	IA
Jim Tentinger	712-660-0982	24332 220th St	Merrill	IA
Jeff Weidauer	712-548-4746	31371 195th St	Le Mars	IA

Smithfield New Site List 10/3/25: Permit 84-SDP-11-22

Site Name	Farmer	Landowner	County	Township	T, R	Section	Section Description	Total Acres	Acceptable Land Application Acres
Weidauer Home	Jeff Weidauer	Jeff Weidauer	Plymouth	America	T92N, R45W	19	E 1/2 of NW 1/4 and W 1/2 of NE 1/4	112	112

Farmer/Owner Information

Name	Phone	Address	City	State
Jeff Weidauer	712-548-4746	31371 195th St	Le Mars	IA

ENVIRONMENTAL LAND MANAGEMENT LLC
waste byproduct landspreading specialists

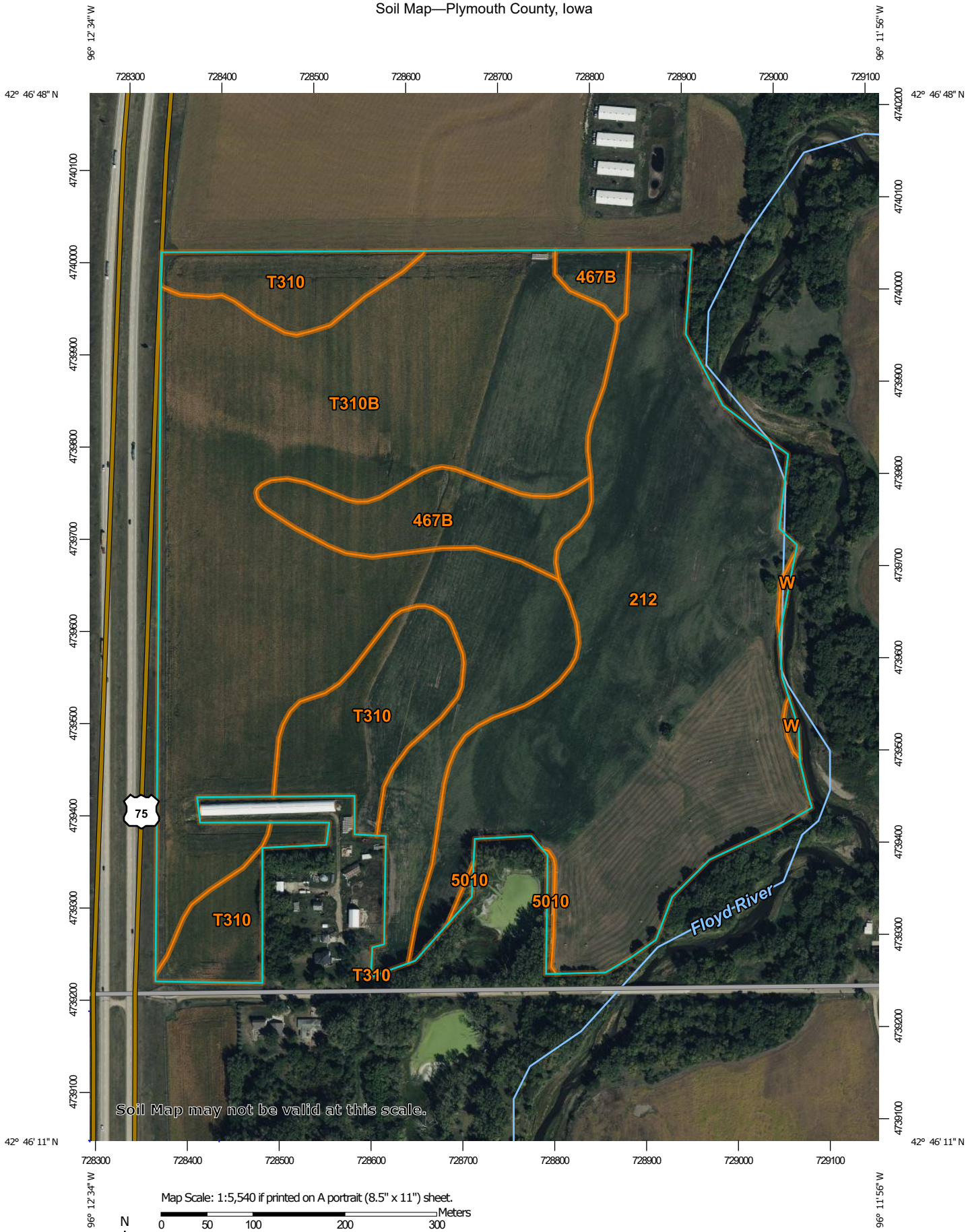
Site Name: Weidauer Home

Unsuitable for Land Application

Jeff Weidauer Phone: (712)540-7567 Spreadable Acres: 98 Deliverable Tons:

I certify I have followed all stockpiling and spreading rules provided by ELM.

Signature_____ Date_____



Map Scale: 1:5,540 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Plymouth County, Iowa
Survey Area Data: Version 36, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 19, 2022—Sep 20, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
212	Kennebec silt loam, 0 to 2 percent slopes, occasionally flooded	40.6	35.4%
467B	Radford silty clay loam, 2 to 5 percent slopes	7.0	6.1%
5010	Pits, sand and gravel	0.4	0.3%
T310	Galva silty clay loam, terrace, 0 to 2 percent slopes	13.6	11.8%
T310B	Galva silty clay loam, terrace, 2 to 5 percent slopes	53.0	46.1%
W	Lakes and Ponds	0.3	0.2%
Totals for Area of Interest		**114.9**	**100.0%**

T Factor

Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
212	Kennebec silt loam, 0 to 2 percent slopes, occasionally flooded	5	40.6	35.4%
467B	Radford silty clay loam, 2 to 5 percent slopes	5	7.0	6.1%
5010	Pits, sand and gravel		0.4	0.3%
T310	Galva silty clay loam, terrace, 0 to 2 percent slopes	5	13.6	11.8%
T310B	Galva silty clay loam, terrace, 2 to 5 percent slopes	5	53.0	46.1%
W	Lakes and Ponds		0.3	0.2%
Totals for Area of Interest			**114.9**	**100.0%**

Description

The T factor is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Rating Options

Units of Measure: tons per acre per year

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
212	Kennebec silt loam, 0 to 2 percent slopes, occasionally flooded	122	40.6	35.4%
467B	Radford silty clay loam, 2 to 5 percent slopes	30	7.0	6.1%
5010	Pits, sand and gravel	>200	0.4	0.3%
T310	Galva silty clay loam, terrace, 0 to 2 percent slopes	>200	13.6	11.8%
T310B	Galva silty clay loam, terrace, 2 to 5 percent slopes	>200	53.0	46.1%
W	Lakes and Ponds	>200	0.3	0.2%
Totals for Area of Interest			**114.9**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Having issues? A prototype of a new version of Facility Explorer is available at **https://facilityexplorer.iowadnr.gov/FacilityExplorer4/** x

Well Search

Well Search Report

Site: Weidauer Home

Included in search	No. of wells	Database
X	17	IGS well database General well database maintained by IGS, location accuracy varies 3,730 to 25 ft., last updated 8/2005.
X	0	Public wells Muncipal and nonmunicipal public well databases maintained by IGS, location varies 3,730 to 25 ft., under development.
X	0	SDWIS public wells Public well database developed from the Safe Drinking Water Information System database maintained by IDNR, estimated locational accuracy varies from 15m. to 3300m. Created from 5/2005 data.
X	0	Private well tracking system IDNR database management system for Grants-to-counties-covered wells. Locational accuracy unknown, assumed to be +/- 17 m., Last update 7/2005.
X	9	Wells registered for testing Wells tested under Grant-to-Counties program. Locational accuracy varies 1150 to 150 m.; Last update 9/2001, no future updates planned.
X	0	Permitted private wells Wells permitted under Grant-to-Counties program. Locational accuracy varies 1150 to 150 m.; Last update 9/2001, no future updates planned.
X	4	Registered abandoned wells Wells abandoned under Grant-to-Counties program. Locational accuracy varies 1150 to 150 m.; Last update 9/2001, no future updates planned.
X	0	Water use facilities Wells used by facilities permitted to withdraw >25,000 gallons per day, locational accuracy is +/-20m to 1150 m. Created from 7/2005 data.
X	0	Municipal wells and intakes Locational accuracy 220 m., last updated 8/96.
X	0	Ag drainage wells Locational accuracy 100 m., last updated 4/98.

Well Search Detail

Subject: XY UTM Coordinates: 237846/4740923
Search Radius (mi): 1

IGS Well Database

Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
197902	23977	T92N, R45W, 19, SE NE NW	Calc. +/- 470 ft.	787 (m)	55	8/25/1976	Igs-Usgs	Bedrock Depth: 24 Well Type: Exploration (Other)
197903	23978	T92N, R45W, 19, NE SW SE	Calc. +/- 470 ft.	513 (m)	35	8/25/1976	Igs-Usgs	Bedrock Depth: 11 Well Type: Exploration (Other)
155944	23980	T92N, R45W, 20, NW SW NW	Calc. +/- 470 ft.	896 (m)	80		Igs-Usgs	Bedrock Depth: 68 Well Type: Exploration (Other)
155945	23981	T92N, R45W, 20, NW NW	Calc. +/- 930 ft.	975 (m)	56		Igs-Usgs	Bedrock Depth: 35 Well Type: Exploration (Other)
155946	23982	T92N, R45W, 20, NW NW	Calc. +/- 930 ft.	975 (m)	30		Igs-Usgs	Bedrock Depth: 26 Well Type: Exploration (Other)
155947	23983	T92N, R45W, 19, NE SE SE SE	Calc. +/- 230 ft.	860 (m)	40		Igs-Usgs	Bedrock Depth: 35 Well Type: Exploration (Other)
155948	23988	T92N, R45W, 19, NW SE SE	Calc. +/- 470 ft.	428 (m)	20		Igs-Usgs	Bedrock Depth: 18 Well Type: Exploration (Other)
155954	23999	T92N, R45W, 19, SE SE SE	Calc. +/- 470 ft.	1396 (m)	51		Igs-Usgs	Bedrock Depth: 34 Well Type: Exploration (Other)
155955	24000	T92N, R45W, 30, NE NE NE	Calc. +/- 470 ft.	1575 (m)	40		Igs-Usgs	Bedrock Depth: 38 Well Type: Exploration (Other)
161427	23984	T92N, R46W, 24, NE NE SE NE	Calc. +/- 230 ft.	784 (m)	40		Igs-Usgs	Bedrock Depth: 35 Well Type: Exploration (Other)
161428	23985	T92N, R45W, 20, NW SW SW	Calc. +/- 470 ft.	964 (m)	30		Igs-Usgs	Bedrock Depth: 26 Well Type: Exploration (Other)
161429	23986	T92N, R45W, 19, SE SE NE	Calc. +/- 470 ft.	1224 (m)	39		Igs-Usgs	Bedrock Depth: 23 Well Type: Exploration (Other)
161430	23987	T92N, R45W, 30, NE NW	Calc. +/- 470 ft.	1540 (m)	25		Igs-Usgs	Bedrock Depth: 22 Well Type: Exploration (Other)
192902	40590	T92N, R45W, 20, NE SW SW	GPS	(m)	354	11/12/1969	Le Mars, City Of	Bedrock Depth: 73 Well Type: Public Supply
189775	18832	T92N, R45W, 20, NW SE SE	GPS	1563 (m)	345	3/1/1967	Le Mars, City Of	Bedrock Depth: 50 Well Type: Municipal

189776	18832	T92N, R45W, 20, NW SE SE	GPS	1563 (m)	345	3/1/1967	Le Mars, City Of	Bedrock Depth: 50 Well Type: Public Supply
206777	40593	T92N, R45W, 20, SW NE NE	GPS	(m)	337	1/1/1990	Le Mars, City Of	Bedrock Depth: 0 Well Type: Public Supply

Public Wells

Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
No records found from this data source								

SDWIS public wells

Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
No records found from this data source								

Private Well Tracking System

Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
No records found from this data source								

Wells Registered For Testing

Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
2077	40583	T92N, R45W, Sec. 18, SE, SW, NE	Calc. +/- 285m.	537 (m)	32	1961	Hoss, Donald C.	Drilling method: Drilled; Known well depth
2078	40585	T92N, R45W, Sec. 18, SE, SW, SE	Calc. +/- 285m.	533 (m)	29	1936	Hoss, Donald C.	Drilling method: Drilled; Known well depth
2225	17254	T92N, R45W, Sec. 20, SW, NW, SW	Calc. +/- 285m.	1203 (m)	35	1940	Karli, Gary	
2219	33506	T92N, R45W, Sec. 20, SW, NW, NW	Calc. +/- 140m.	1065 (m)	unkn	unkn	Killeas, Helen M	
2272	80308	T92N, R45W, Sec. 29, NW, NW, NE	Calc. +/- 285m.	(m)	47	1991	Palmer, Dave	Drilling method: Drilled; Known well depth
2274	80299	T92N, R45W, Sec. 29, NW, NW, SE	Calc. +/- 285m.	(m)	47	1991	Palmer, Dave	Drilling method: Drilled; Known well depth
2181	34938	T92N, R45W, Sec. 19, SW, NE, NW	Calc. +/- 285m.	738 (m)	unkn	unkn	Sigler, Carla & Donna	
2032	19146	T92N, R45W, Sec. 18, SE, NW, NW	Calc. +/- 1135m.	1084 (m)	40	1940	Thommes, William	Drilling method: Bored; Known well depth

2035	8004	T92N, R45W, Sec. 18, NE, SE, NW	Calc. +/- 285m.	1439 (m)	40	1940	Thommes, William	Drilling method: Bored; Known well depth

Permitted Private Wells

Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
No records found from this data source								

Abandoned Wells (plugged)

Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
2146	13282	T92N, R46W, Sec. 24, SE, NE, NE	Calc. +/- 140m.	1052 (m)	unkn	n.a.	Iowa Dnr, Dnr-Gsb	Well plugged: 2/28/1991; Well type: < 18" dia.
2161	3161	T92N, R45W, Sec. 20, NW, NW, NW	Calc. +/- 285m.	968 (m)	unkn	n.a.	Iowa Dnr, Dnr-Gsb	Well plugged: 12/12/1990; Well type: < 18" dia.
2244	3163	T92N, R45W, Sec. 19, SE, SE, SE	Calc. +/- 140m.	1406 (m)	unkn	n.a.	Iowa Dnr, Dnr-Gsb	Well plugged: 12/12/1990; Well type: < 18" dia.
2175	13289	T92N, R45W, Sec. 19, NE, SE, NW	Calc. +/- 140m.	660 (m)	26	n.a.	Lemars Airport, Lemars Airport	Well plugged: 10/20/1993; Well type: > 18" dia.

Water Use Facilities

Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
No records found from this data source								

Municipal Wells And Intakes

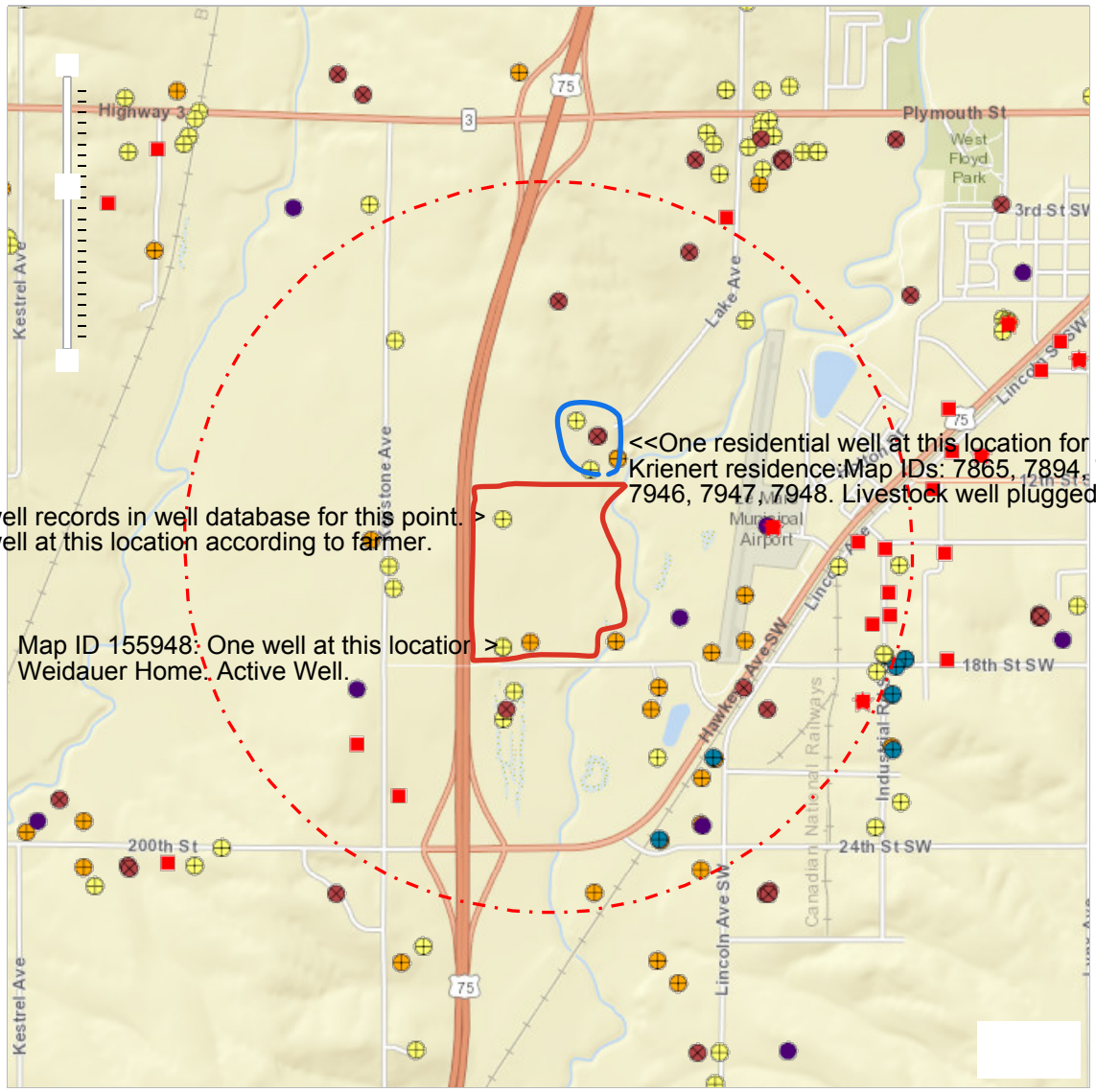
Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
No records found from this data source								

Ag Drainage Wells

Map ID	Well No.	Location	Accuracy	Dist. From Point	Well Depth	Construction/ Permit Date	Owner/ Permittees	Other Information
No records found from this data source								

Well Search Buffered Map

Subject: XY UTM Coordinates: 237846/4740923
Search Radius (mi): 1



Map Notes:

- UST
- LUST
- Wells

Please refer to the Accuracy column in Well Search Detail.
Since multiple points can be at the same spot (as those located to the center of a quarter section), points were randomly dispersed within 10 meters around that spot so all points can be seen.

EXTended Ag Services, Inc.

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info@extendedag.com

July 2, 2025

Environmental Land Management

1602 11th Drive NE

Austin, MN 55912

RE: Review of Potential Land Application Sites – Smithfield Foods (Plymouth County, Iowa)

Michael,

We have completed our review of the proposed land application site for the Smithfield Foods facilities in Orange City & Sioux Center, Iowa. Thank you for the opportunity to provide our input on this project. The following fields were included in this review, all acres are approximate:

Site Name	Acres
Smithfield SC-OC-SC Weidauer Home	112.5
Grand Total	**112.5**

Imagery provided by the National Ag Imagery Program (2021) was utilized to determine whether land application sites were in crop production, pasture/hay or non-farmed land. Overall, the land application site has few limitations regarding slope steepness and length and general erosion potential.

There are approximately 112.5 acres available for land application of the industrial by-product. The land application site is dominated by silt loams and silty clay loams. All soils have an acceptable soil texture for land application.

According to the NRCS, 100% of the sites have acceptable slopes for the land application the Smithfield byproducts (0-9%). Despite the acceptable slopes, approximately 63.9% of the soils are classified as having slight concerns regarding erosion potential, the remaining acres have no concerns regarding erosion potential. According to the NRCS, 0% of the soils are classified as a Highly Erodible Map Unit.

Field specific planning and/or residue management should be utilized when applying the byproduct to reduce the potential for movement offsite, on all sites. Application can and should be limited to areas with the lowest slope first and then be directed to areas the furthest from sensitive features such as water. The

application of the byproduct is not expected to conflict with any Conservation Plans associated with the observed soils. A summary of slope ratings for the potential land application sites is included below:

Slope Range	Acres
------	0.3
0-2%	52.9
2-5%	59.2
Grand Total	**112.5**

None of the soils in the potential land application site are listed by the NRCS soil survey as commonly or frequently flooded. Still, it is assumed that agricultural drain tile has been installed, to varying degrees, on soils with poor or somewhat poor drainage. Flooding frequency is not expected to be a limiting factor for land application. However, land application on saturated soils should be avoided at all times. Further, land application on fields with higher slope ranges and predicted rainfall within 24 hours should be limited. A complete breakdown of flooding frequency ratings is shown below:

NRCS Flooding Frequency	Acres
------	0.3
NONE	65.1
RARE	6.8
OCCASSIONAL	24.1
COMMON	16.2
Grand Total	**112.5**

Determining appropriate land application rates for any by-product is dependent on the most restrictive variable. This can be either slope, erosivity, flooding potential, soil fertility levels, soil texture or byproduct characteristics, to name a few. The recommendations given herein are independent of any byproduct reviews and only consider the known field characteristics discussed in this review.

Application rates of approximately 15 Wet Tons per acre are appropriate for the field conditions of the land application sites discussed in this review. Appropriate measures should be taken to ensure minimal movement of the waste respect to adequate setbacks from sensitive features (surface water, karst features, conduits to water and high slopes) and land application rates. Special care should be given to applying wastes no less than 48 hours prior to rainfall events of greater than 0.5 inches. Wastes should be incorporated whenever possible, if such practices do not conflict with existing NRCS conservation plans. Applications of organic by-products can result in improved soil fertility, tilth and structure, if properly managed. The soils and parent material on the proposed land application site are naturally acidic in nature. Agricultural lime should be applied to ensure the soil pH is above 6.0 prior to land application of any byproducts.

Summary

The specified land application material should be evaluated for constituents that pose a risk to the general health and welfare of the public. In general, land utilized for the land application of solid waste containing nutrients needed for pasture or crop production will benefit from such applications. Careful consideration should be taken to ensure nutrients are not applied at levels greater than crop need, once soils have reached the high fertility range as defined by Iowa State University.

In summary, we believe the field conditions are very suitable for land application of solid wastes if done in accordance with all applicable rules, permits and laws. If you have any questions, please do not hesitate to contact us.

Sincerely,

Jim Nesseth
Certified Agronomist
License #: 17118

Andrew Nesseth
Environmental Consultant
NRCS Technical Service Provider

America Township of Plymouth County

Section 19

Customer Name	WEIDAUER, JEFF
Farm Name	HOME
Field Name	HOME ALL
Field Code	AME19N
Sampled	Spring 2025
Field Acres	107.46 acres
Acres per Sample	4.48

SOIL ANALYSIS REPORT

CLIENT: 57837 39248	REMSEN FARMERS COOP - RETAIL 6 S WASHINGTON ST REMSEN, IA 51050

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LAB NO:	51912 - 51935
INVOICE NO:	175483
DATE RECEIVED:	04/14/2025
DATE REPORTED:	04/15/2025

* Test Rating based on 8 inch sample | VERY LOW | LOW | MEDIUM | OPTIMUM | HIGH | VERY HIGH | * General Guidelines (not crop specific)

SOIL ANALYSIS RESULTS FOR: REMSEN FARMERS COOP **FARM:** JEFF WEIDAUR **FIELD ID:** AME19N

METHOD USED:			1:1 (v) Water:Soil	Sikora 2		KCl(t)	LOI			Mehlich 3 (colorimetric)	Mehlich 3 ICP						Chelated DTPA	Mehlich 3 ICP			
Lab Number	Sample ID	Sample Depth	Soil pH	Buffer pH		Excess Lime	% Organic Matter			Phosphorus ppm P	Potassium ppm K	Sulfur ppm	Sulfur lb./A	Calcium ppm Ca	Magnesium ppm Mg	Sodium ppm Na	Zinc ppm Zn	Iron ppm Fe	Manganese ppm Mn	Copper ppm Cu	Boron ppm B
51912	1	0 - 7	6.3			No	2.9			61	133	7	15	2710	400	12	1.2	197	101	3.0	0.8
51913	2	0 - 7	6.4			No	2.1			65	95	8	17	1810	200	12	1.5	221	102	2.2	0.8
51914	3	0 - 7	6.5			No	2.4			68	128	7	15	2600	368	9	1.9	182	114	2.6	0.8
51915	4	0 - 7	6.2	7.3		No	1.4			101	214	5	13	2120	282	5	1.9	221	129	2.4	0.7
51916	5	0 - 7	5.7	7.0		No	2.5			61	103	8	17	2400	372	10	1.0	205	74	2.5	0.5
51917	6	0 - 7	5.5	6.8		No	3.1			53	206	11	23	1940	270	8	1.0	196	96	2.5	0.4
51918	7	0 - 7	6.3			No	2.9			61	128	8	17	2630	412	8	1.4	205	90	2.5	0.7
51919	8	0 - 7	6.2	7.2		No	2.6			24	93	6	13	2720	388	10	0.8	153	101	2.3	0.6
51920	9	0 - 7	6.3			No	2.5			84	294	7	15	2780	456	8	1.4	175	112	2.3	0.7
51921	10	0 - 7	5.5	6.8		No	3.3			53	178	10	21	2350	362	9	0.9	238	81	2.6	0.5
51922	11	0 - 7	5.5	6.8		No	3.6			140	379	14	29	1840	322	10	1.7	228	97	2.5	0.5
51923	12	0 - 7	5.5	6.9		No	2.9			117	295	13	27	2000	400	11	1.2	215	74	2.1	0.4
51924	13	0 - 7	5.7	7.0		No	3.5			125	237	14	29	2310	425	15	2.0	194	70	2.8	0.4
51925	14	0 - 7	6.5			No	3.4			162	690	9	19	3000	554	14	3.1	147	158	3.3	0.8
51926	15	0 - 7	5.4	6.5		No	3.0			97	348	14	29	1730	329	13	1.3	200	86	2.1	0.4
51927	16	0 - 7	5.6	6.6		No	3.2			115	358	12	25	1820	298	8	1.8	202	90	2.4	0.5
51928	17	0 - 7	5.9	6.9		No	3.7			121	651	10	21	2430	340	9	2.2	209	101	2.5	0.4
51929	18	0 - 7	5.6	6.8		No	3.0			143	438	13	27	1870	304	11	2.2	238	100	2.9	0.5
51930	19	0 - 7	5.4	6.6		No	3.4			110	363	14	29	1730	326	11	1.5	227	103	2.7	0.6
51931	20	0 - 7	4.9	6.4		No	3.1			110	429	16	34	1540	278	8	1.0	243	103	2.3	0.5
51932	21	0 - 7	6.6			No	3.2			94	219	9	19	3470	379	8	1.8	146	101	2.6	0.8
51933	22	0 - 7	6.1	7.0		No	3.2			90	219	12	25	2960	414	12	1.9	161	71	2.2	0.8

Analyses are representative of the samples submitted   Samples are retained 30 days after report of analysis   Explanations of soil analysis terms are available upon request

Reviewed and Approved By: Amy Meier, Data Review Coordinator

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SOIL ANALYSIS REPORT

CLIENT:	REMSEN FARMERS COOP - RETAIL
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39248	REMSEN, IA 51050

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LAB NO:	51912 - 51935
INVOICE NO:	175483
DATE RECEIVED:	04/14/2025
DATE REPORTED:	04/15/2025

* Test Rating based on 6 inch sample

VERY LOW | LOW | MEDIUM | OPTIMUM | HIGH | VERY HIGH

* General Guidelines (not crop specific)

SOIL ANALYSIS RESULTS FOR: REMSEN FARMERS COOP **FARM:** JEFF WEIDAUR **FIELD ID:** AME19N

METHOD USED:			1:1 Water-Soil	Sikora 2		KCl	LOI			Mehlich 3 colorimetric	Mehlich 3 ICP						Chelate DTPA	Mehlich 3 ICP			
Lab Number	Sample ID	Sample Depth	Soil pH	Buffer pH		Excess Lime	% Organic Matter			Phosphorus ppm P	Potassium ppm K	Sulfur ppm	Sulfur lb S/A	Calcium ppm Ca	Magnesium ppm Mg	Sodium ppm Na	Zinc ppm Zn	Iron ppm Fe	Manganese ppm Mn	Copper ppm Cu	Boron ppm B
51934	23	0 - 7	5.6	6.8		No	2.8			82	189	12	25	2030	353	12	1.5	195	64	2.2	0.3
51935	24	0 - 7	5.7	6.7		No	3.4			126	303	11	23	2340	380	12	1.7	251	92	2.7	0.6

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Reviewed and Approved By: Amy Meier, Data Review Coordinator

04/15/2025 4:15 pm

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SOIL ANALYSIS REPORT

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LAB NO:	51912 - 51933
INVOICE NO:	175483
DATE RECEIVED:	04/14/2025
DATE REPORTED:	04/15/2025

* Test Rating based on 6 inch sample

VERY LOW	LOW	MEDIUM	OPTIMUM	HIGH	VERY HIGH

* General Guidelines (not crop specific)

SOIL ANALYSIS RESULTS FOR: REMSEN FARMERS COOP **FARM:** JEFF WEIDAUR **FIELD ID:** AME19N

METHOD USED: Bray P1

Lab Number	Sample ID	Sample Depth	Date Sampled	Bray Phosphorus ppm P
51912	1	0 - 7	04/08/25	54
51913	2	0 - 7	04/08/25	58
51914	3	0 - 7	04/08/25	53
51915	4	0 - 7	04/08/25	59
51916	5	0 - 7	04/08/25	45
51917	6	0 - 7	04/08/25	47
51918	7	0 - 7	04/08/25	54
51919	8	0 - 7	04/08/25	21
51920	9	0 - 7	04/08/25	76
51921	10	0 - 7	04/08/25	47
51922	11	0 - 7	04/08/25	134
51923	12	0 - 7	04/08/25	108
51924	13	0 - 7	04/08/25	118
51925	14	0 - 7	04/08/25	144
51926	15	0 - 7	04/08/25	66
51927	16	0 - 7	04/08/25	101
51928	17	0 - 7	04/08/25	107
51929	18	0 - 7	04/08/25	127
51930	19	0 - 7	04/08/25	97
51931	20	0 - 7	04/08/25	97
51932	21	0 - 7	04/08/25	84
51933	22	0 - 7	04/08/25	79

Analyses are representative of the samples submitted. Samples are retained 30 days after report of analysis. Explanations of soil analysis terms are available upon request.

Reviewed and Approved By: Amy Meier, Data Review Coordinator

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SOIL ANALYSIS REPORT

CLIENT: 57837 38248	REMSEN FARMERS COOP - RETAIL 6 S WASHINGTON ST REMSEN, IA 51050

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LAB NO:	51912 - 51935
INVOICE NO:	175483
DATE RECEIVED:	04/14/2025
DATE REPORTED:	04/15/2025

* Test Rating based on 8 inch sample

VERY LOW	LOW	MEDIUM	OPTIMUM	HIGH	VERY HIGH

* General Guidelines (not crop specific)

SOIL ANALYSIS RESULTS FOR: REMSEN FARMERS COOP **FARM:** JEFF WEIDAUR **FIELD ID:** AME19N

METHOD USED:

Lab Number	Sample ID	Sample Depth	Date Sampled	Bray P1 ppm P
51934	35	0 - 7	04/08/25	72
51935	24	0 - 7	04/08/25	94

Analyses are representative of the samples submitted. Samples are retained 30 days after report of analysis. Explanations of soil analysis terms are available upon request.

Reviewed and Approved By: Amy Meier, Data Review Coordinator

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SOIL ANALYSIS REPORT

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LAB NO:	51912 - 51935
INVOICE NO:	175483
DATE RECEIVED:	04/14/2025
DATE REPORTED:	04/15/2025

* Test Rating based on 6 inch sample | VERY LOW | LOW | MEDIUM | OPTIMUM | HIGH | VERY HIGH | * General Guidelines (not crop specific)

SOIL ANALYSIS RESULTS FOR: REMSEN FARMERS COOP **FARM:** JEFF WEIDAUR **FIELD ID:** AME19N

FERTILIZER RECOMMENDATIONS: POUNDS ACTUAL NUTRIENT PER ACRE

Lab Number	Sample ID	Crop To Be Grown	Yield Goal	Lime: ECC Tons/A to raise pH to: 6.0	6.5	7.0	N	P2O5	K2O	Zn	S	Mn	Cu	MgO	B	Ca	Cl
51912	1																
51913	2																
51914	3																
51915	4			0.0	0.2	0.5											
51916	5			0.3	1.0	1.6											
51917	6			0.9	1.7	2.5											
51918	7																
51919	8			0.0	0.3	0.8											
51920	9																
51921	10			0.9	1.8	2.5											
51922	11			1.0	1.8	2.5											
51923	12			0.8	1.5	2.1											
51924	13			0.4	1.0	1.7											
51925	14																
51926	15			1.6	2.7	3.7											
51927	16			1.1	2.3	3.2											
51928	17			0.2	1.1	1.9											
51929	18			0.8	1.6	2.4											
51930	19			1.4	2.4	3.3											
51931	20			2.6	3.5	4.1											
51932	21																
51933	22			0.0	0.6	1.4											

Cation Exchange Capacity

CEC	%H	%K	%Ca	%Mg	%Na
17	0	2	78	19	0
12	0	2	79	19	0
18	0	2	79	19	0
13	0	4	79	16	0
15	0	2	78	20	0
15	16	4	65	15	0
17	0	2	78	20	0
17	0	1	80	19	0
18	0	4	76	20	0
15	14	3	67	17	0
15	16	6	60	18	0
15	8	5	65	22	0
16	0	5	73	22	0
21	0	8	70	22	0
18	33	5	47	16	0
17	28	5	52	14	0
18	7	9	68	16	0
15	16	7	61	16	0
17	28	5	51	16	0
18	39	6	42	13	0
21	0	3	82	15	0
19	0	3	78	18	0

Analyses are representative of the samples submitted. Samples are retained 30 days after report of analysis. Explanations of soil analysis terms are available upon request.

Reviewed and Approved By: Amy Meier, Data Review Coordinator

The reported analytical results apply only to the sample as it was supplied. The report may not be reproduced, except in full, without permission of ServiTech.
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SOIL ANALYSIS REPORT

CLIENT:	REMSEN FARMERS COOP - RETAIL 6 S WASHINGTON ST REMSEN, IA 51050
57837	
39248	

servi tech
www.servitech.com
6921 S. Bell
Amarillo, TX 79109
800.567.7509
806.677.0093
Fax 806.677.0329

LAB NO:	51912 - 51935
INVOICE NO:	175483
DATE RECEIVED:	04/14/2025
DATE REPORTED:	04/15/2025

* Test Rating based on 8 inch sample | VERY LOW | LOW | MEDIUM | OPTIMUM | HIGH | VERY HIGH | * General Guidelines (not crop specific)

SOIL ANALYSIS RESULTS FOR: REMSEN FARMERS COOP **FARM:** JEFF WEIDAUR **FIELD ID:** AME19N

FERTILIZER RECOMMENDATIONS: POUNDS ACTUAL NUTRIENT PER ACRE

Lab Number	Sample ID	Crop To Be Grown	Yield Goal	Lime: CCE Target pH to raise pH to			N	P_2O_5	K_2O	Zn	S	Mn	Cu	MgO	B	Ca	Cl
				6.3	6.5	7.0											
51934	23			1.0	2.2	3.2											
51935	24			0.7	1.5	2.6											

Cation Exchange Capacity

CEC	%H	%K	%Ca	%Mg	%Na
18	26	3	55	16	0
19	19	4	60	17	0

SPECIAL COMMENTS AND SUGGESTIONS:

Lab Number(s): 51912, 51913, 51914, 51915, 51916, 51917, 51918, 51919, 51920, 51921, 51922, 51923, 51924, 51925, 51
Servi-Tech Laboratory fertilizer recommendations were not requested.

Lab Number(s): 51912, 51913, 51914, 51915, 51916, 51917, 51918, 51919, 51920, 51921, 51922, 51923, 51924, 51925, 51
Nutrient analyses determined using the Mehlich 3 extraction.

Lab Number(s): 51912, 51913, 51914, 51915, 51916, 51917, 51918, 51919, 51920, 51921, 51922, 51923, 51924, 51925, 51
ZINC: The "c-DTPA-Zinc" equivalent was calculated from the Mehlich-3 ICP zinc value. Zinc fertilizer recommendations were calculated using the Mehlich-3 ICP zinc value

Lab Number(s): 51912, 51913, 51914, 51915, 51916, 51917, 51918, 51919, 51920, 51921, 51922, 51923, 51924, 51925, 51
PHOSPHORUS: The c-Bray-P1 equivalent was calculated from the Mehlich-3 phosphorus concentrations.

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Contractual Consent of Landowner

Landowner, Lessee and/or Landoperator: Jeff Weidauer
Location of storage sites and spreading site(s): All permitted sites owned, leased and rented.
Description of byproduct to be stored and land applied on site(s): Byproduct waste consisting of wastewater sludge generated from the Premium Pet Health pet and livestock feed processing plant in Orange City, IA and wastewater sludge generated from the Golden Crisp Premium Foods pork processing plant in Sioux Center, IA and wastewater sludge generated from the Curly's Foods processing plant in Sioux City, IA.
Industrial Sludge is generated from: Premium Pet Health, Orange City, IA; Golden Crisp Premium Foods, Sioux Center, IA; Curly's Foods, Sioux City, IA.

Nutrient Analysis of sludge byproduct on a "as received" basis:
Metals Analysis of sludge byproduct on a "dry" basis:
****Analysis is not guaranteed for agronomic value. Nutrient analysis is an average of four samples from 2021-2022 from the Krienert and Less storage lagoons and does not include the byproduct from Curly's. Metals anlalysis from one sample in 2022. Byproduct output will be variable.*

Total Solids	9.95 %	Arsenic	none detected
pH	5.88	Barium	3.4 mg/kg
Tot Kjeldahl Nitrogen	0.37 %	Cadmium	none detected
Ammonia Nitrogen	0.20 %	Chromium	4.4 mg/kg
Phosphorus	0.09 %	Copper	9.7 mg/kg
P2O5	0.21 %	Lead	none detected
Potassium	0.04 %	Mercury	none detected
K2O	0.05 %	Molybdenum	none detected
		Nickel	2.2 mg/kg
		Selenium	0.8 mg/kg
		Silver	none detected
		Zinc	74.5 mg/kg

****Check with your Agronomist to verify that these nutrients and other constituents are not harmful to the crops you are growing during the coming year.

I have reviewed this information and am authorized to hereby give permission to Smithfield Foods (Premium Pet Health & Golden Crisp Premium Foods & Curly's Foods) to store and land apply on the spreading sites.

Signed: Jeff Weidauer Date: 04-29-25