DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

October 15, 2019

Mark Wiggs
General Plant Manager
Smithfield Foods
1400 N Weber Ave
Sioux Falls, SD 57103

RE: Surface Water Discharge Compliance Inspection SWD Permit Number: SD0000078

Dear Mr. Wiggs:

The South Dakota Department of Environment and Natural Resources conducted a Surface Water Discharge Compliance Inspection of the facility's wastewater treatment facility on August 27, 2019. I appreciate Chuck Schulz, Todd Gackstetter, and Jason Lindquist's time and cooperation in supplying the requested information.

I have enclosed an inspection summary and a copy of the inspection report. Please pay special attention to the Inspection Summary tables and implement the required corrective actions as soon as possible. All corrective actions taken will be reviewed during our next inspection at your facility.

Thank you for your continued efforts to protect the environment and natural resources of South Dakota. Please review this report for accuracy and respond within thirty days with any needed corrections. If you have any questions about this letter or the inspection reports, please contact me at (605) 773-3351.

Sincerely,

Kyle Doerr
Engineer II
Surface Water Quality Program
Enclosures

cc: Mark Gerwer, Smithfield Foods, WW Treatment Facilities Manager
Charles Schulz, Smithfield Foods, Environmental Coordinator,
SWD File - Pierre

INSPECTION SUMMARY

Facility: Smithfield Foods

SWD Permit: SD0000078

Inspection Date: August 27, 2019

The following comments and corrective actions are ***required*** in order to come into compliance with the facility's surface water discharge permit.

COMMENTS	REQUIRED CORRECTIVE ACTIONS
The facility has had numerous effluent violations for BOD, TSS, Fecal Coliform, and Ammonia. These violations have led to enforcement actions which one has been finalized and the second is in process.	These violations are not acceptable and can lead to further enforcement actions which can include fines and penalties. The facility has made modifications to ensure adequate treatment of the wastewater.

INDUSTRIAL INSPECTION CHECKLIST

I. General Facility Information

Name	**Smithfield Foods**		
Location	**¼ mile west of N. Cliff and E Rice Intersection on E Rice in S9, T101N, R49W in Sioux Falls, SD**		
SWD Permit Number	**SD0000078**		
Mailing Address	**1400 N Weber Ave, Sioux Falls, SD 57103**		
Facility Street Address	**1400 N Weber Ave, Sioux Falls, SD 57103**		
Contact Person / Title	**Charles Schulz, Env. Coor**	Phone Number	**(605) 330-3656**
Responsible Party / Title	**Mark Wiggs, Gen. Manager**	Phone Number	**(605) 330-3135**
Facility Email address	**N/A**		

Persons present during the inspection:

Name / Title	Phone Number / Email Address	Affiliation
Chuck Schulz/ Environmental Coordinator	**605-330-3656/ cschulz@smithfield.com**	**Smithfield Foods**
Todd Gackstetter/ Director of Maintenance & Engineering	**605-330-3645/ tgackstetter@smithfield.com**	**Smithfield Foods**
Jason Lindquist/ Director of Environmental Affairs	**605-330-3478/ jlindquist@smithfield.com**	**Smithfield Foods**
Kyle Doerr/ Engineer II	**(605) 773-3351 / kyle.doerr@state.sd.us**	**SDDENR**

Inspection Date	**08/27/2019**	Last Inspection Date	**Offsite:11/5/18 Onsite: 5/17/17**
Entrance Time	**10:45 AM**	Exit Time	**3:00 PM**
Permit Effective Date	**4/1/2000**	Permit Expiration Date	**3/31/2005**
Date Facility Began Operation	**1982**		
Dates of Facility Upgrades	**1996-2008, 2010, 2011, 2016**		
Receiving Water and Classification	**Big Sioux River (1,5,7,8,9,10) then approximately 300 ft downstream (5,7,8,9,10)**		

List any deficiencies the previous inspection identified which the facility was required to correct:
None

Were the deficiencies corrected: ☐ Yes ☐ No Comments: **No deficiencies to correct**

SIC/NAICS codes:	**2011- Meat Packing Plant** **311611- Animal [Except Poultry] Slaughtering**
Hours of operation per day:	**18-19 hours/ day**
Manufacturing processes used:	**Hog processing and packaging**
Raw materials used:	**Hogs**
Production rate:	**19,500 hogs/ day**

Type of Discharge:

☐ No Discharge ☐ Intermittent with PTD ☐ Intermittent without PTD ☒ Continuous

Type of Facility:

☐ Stabilization Ponds only ☐ Stabilization Ponds/Artificial Wetlands ☒ Mechanical

☐ Hybrid: Mechanical and Stabilization Ponds ☐ Land Application ☐ I/P Basins

II. Facility Description

Facility Description from the Statement of Basis and Flow Diagram
Facility Description is from draft permit that is currently in internal review.

Smithfield Foods operates a meat packing facility and wastewater treatment plant (WWTP), located in Sioux Falls in the Southeast ¼ and the Southwest ¼ of Section 9, Township 101 North, Range 49 West (Latitude 43.565152°, Longitude -96.719948°, satellite map estimation).

Smithfield is a complex slaughterhouse with a full line of meat processing, where approximately 20,000 hogs are slaughtered per day. The hogs are killed, and the carcasses are trimmed, washed, and hung in cooling rooms where they are later processed into bacon, hams, and franks. The production of sausages, canning of meat, and other edible and inedible products are also included in the production processes.

Skins are removed from the pigs, cured, and shipped to tanners. All other byproducts are rendered, including the blood. In addition, some outside products are brought in for rendering or processing.

Production has two nine-hour shifts plus five hours of cleaning per day, operating Monday through Friday with occasional Saturdays. The Wastewater treatment facility is operated 24/7 with 12-hour shifts.

Smithfield processes 3.0 million gallons per day (MGD) of influent to the wastewater treatment plant (WWTP) during its daily operations when the plant runs processing, typically Monday through Friday and some Saturdays. On weekends, influent flow is approximately 1.0 MGD. The weekly average flow is approximately 2.37 MGD, and is equalized through the wastewater treatment plant over the week. Attachment 1 includes a WWTP flow diagram.

The Smithfield WWTP has an average design flow of 3.5 MGD; this flow will be used for effluent limits development. Peak design flow has been reassessed due to recent heavy rainfall events and stormwater treatment; it has increased from 4.2 MGD (current permit) to 4.350 MGD (facility email correspondence, July 2019).

A breakdown of the daily wastewater production is as follows (2017 inspection):

	Flow (MGD)
Meat Processing Operations	
Meat Processing	**2.095**
Cooling Water/Boiler Blowdown	**0.085**

Defrosting wastewater	**0.050**	
Sanitary wastewater	**0.075**	
Total Meat Processing Flow		**2.305**
Rendering/Stockyard Operations		
Rendering	**0.550**	
Spray Water/Stockyard Cleanup	**0.125**	
Sanitary wastewater	**0.010**	
Total Rendering/Stockyard Flow	**0.685**	
Other Plant Operations		
Engine/Boiler Blowdown	**0.010**	
Total Other Plant Operations		**0.010**
Total Plant Flow	***3.000***	

The wastewater treatment facility was completed in 1983 and has been upgraded over the years (1996-2008, 2010, 2011, and 2016). Combined influent from plant production processes, plant domestic wastewater, and core stormwater areas flows by gravity to two screw pumps, which alternate daily unless both are needed. Preliminary treatment includes one mechanical 1-inch bar screen with one manual bar screen for backup, a grit classifier, influent flow measurement via 24-inch Parshall Flume and HydroRanger ultrasonic flowmeter, and two 0.004-inch rotary screens.

After preliminary treatment, primary treatment includes two rectangular Dissolved Air Flotation (DAF) units and five covered anaerobic lagoons. Wastewater can be directed from the DAF to the city of Sioux Falls Wastewater Reclamation Facility (WRF), but typical operation is from the DAF to the anaerobic lagoons. Solids from the DAF are sent to the belt press. A portion of the lagoon flow can be directed to the lagoon clarifier, though typical operation is directly from the lagoons to secondary treatment.

Secondary treatment includes four aeration basins with fine bubble diffusers and two final clarifiers. Waste Activated Sludge (WAS) from the aeration basin is sent to the lagoon clarifier. Return Activated Sludge (RAS) from the final clarifiers is sent to the head of the aeration basins. The aeration basin operates with a 1:1 ratio of waste and return. Approximately 40% of wastewater from the final clarifiers is routed to sand filters prior to chlorine disinfection; the remaining 60% bypasses the sand filters to chlorine disinfection.

Tertiary treatment includes four gravity sand filter cells, a chlorine contact chamber for sodium hypochlorite disinfection, effluent flow measurement via 3.5-ft rectangular weir with end contraction and HydroRanger ultrasonic flowmeter, dechlorination with sodium bisulfite, and post aeration.

Solids treatment includes one lagoon clarifier and two belt presses. The lagoon clarifier is used for WAS thickening and receives some solids from the anaerobic lagoons. One belt press receives waste from the DAF, and the other receives waste from the final clarifiers. The waste streams can be alternated to the presses. Approximately 30 tons of belt press cake per day is produced and then land applied in Iowa (Iowa Sludge Permit 00-SDP-06-13P-LAN). Belt press filtrate goes to the anaerobic lagoons influent pit.

Chemicals are added to wastewater treatment processes for chlorination, dechlorination, pH adjustment, disinfection, and belt press polymers. A list of approved chemicals is included below.

Does the facility match the above description? ☒ Yes ☐ No

Does the statement of basis match the permit? ☒ Yes ☐ No

Are the number and discharge locations described in the permit correct? ☒ Yes ☐ No

Is the approved chemicals list correct? ☒ Yes ☐ No

If any questions are "No" above, please describe modifications or changes.

The outfall location will be moved downstream 150 yards this fall. This will remove the domestic water supply beneficial use that the facility has at its current discharge location.

II. Required Recordkeeping and Reporting

Permit Verification

Yes	No	N/A		
☒	☐	☐	1.	Is a current copy of the permit onsite?
☒	☐	☐	2.	Is operator aware of permit conditions?
☒	☐	☐	3.	Facility, address and contact information is correct in the SWD Database (Fees, PTD's, Inspections, PDF's, Flooding, etc.)? If not, list correct information in comments.
☒	☐	☐	4.	Facility, address and contact and permit information is correct in the ICIS Database, (Monitoring, Limits, Inspections, Schedules, Limit Summary, etc.)? If not, list correct information in comments.
☐	☒	☐	5.	Are there any missing fees?
06/24/2019			6.	Date the last fee was received by DENR:
☐	☒	☐	7.	Have there been any new, different, or increase loadings to the WWTF? If yes, describe in comments.
☒	☐	☐	8.	Have there been any changes in influent flow rate to the WWTF? If yes, describe in comments.

Permit verification comments:
This summer has been very wet so the increase in rain events has led to a higher influent flow rate. The facility runs its storm water through the treatment plant so it does not violate its industrial storm water permit limits.

Inspection Records

Yes	No	N/A		
☒	☐	☐	1.	Is an inspection notebook maintained for the facility and outfall(s)?
☒	☐	☐	2.	Are inspections of the facility and outfall(s) conducted as frequently as required by the permit? Frequency Required: **Daily**
☒	☐	☐	3.	Is all required information recorded?
☒	☐	☐		a. Date and time of the inspection.
☐	☐	☒		b. Name of the inspector(s).
☐	☐	☒		c. Facility's discharge status.

Yes	No	N/A	
☒	☐	☐	d. Amount of freeboard or water depth in stabilization ponds and artificial wetlands.
☒	☐	☐	e. Identification of operational problems and/or maintenance problems.
☒	☐	☐	f. Recommendations, as appropriate, to remedy identified problems.
☒	☐	☐	g. A brief description of any actions taken with regard to problems identified.
☒	☐	☐	h. Other information, as appropriate.
☐	☐	☒	4. Is an inspection notebook maintained for the lift station(s)?
☐	☐	☒	5. Are inspections of the lift station(s) conducted as frequently as required by the permit? Frequency Required:
☐	☐	☒	6. Is all required information recorded?
☐	☐	☒	a. Date and time of the inspection.
☐	☐	☒	b. Name of the inspector(s).
☐	☐	☒	c. Whether an SSO is occurring or has occurred.
☐	☐	☒	d. Identification of operational problems and/or maintenance problems.
☐	☐	☒	e. Cleaning of screenings.
☐	☐	☒	f. Testing of alarms.
☐	☐	☒	g. Hour meter readings
☐	☐	☒	h. Recommendations, as appropriate, to remedy identified problems.
☐	☐	☒	i. A brief description of any actions taken with regard to problems identified.
☐	☐	☒	j. Other information, as appropriate.

Inspection records comments:
The facility has upgraded their control system so they can monitor the whole system from a computer. The program logs the information gathered so it can be pulled if needed. Figure 20 in the photo log shows a picture of the monitoring screen.

Maintenance Records

Yes	No	N/A	
☒	☐	☐	1. Does the facility have a system for addressing maintenance activities?
☒	☐	☐	2. Are records maintained documenting maintenance activities? If yes, describe in comments,

Maintenance Records Comments:
All maintenance activities are logged in a notebook and kept onsite.

Discharge Monitoring Reports

Yes	No	N/A	
☒	☐	☐	1. Is the facility approved for NetDMR? **Approval Date: 06/24/2011**
☐	☐	☒	2. Review the facility's DMR file(s). Are the files complete and reasonably organized?
☒	☐	☐	3. Are sample results and/or lab bench sheets available?
			4. Review any available lab sheets. Do the lab sheets contain the following information?
☒	☐	☐	a. Date and time conducting analysis?
☒	☐	☐	b. Person conducting analysis?
☒	☐	☐	c. Analysis method?
			5. Review any available bench sheets. Do the bench sheets contain the following information?
☒	☐	☐	a. Date and time conducting analysis?
☒	☐	☐	b. Person conducting analysis?

Yes	No	N/A	
☒	☐	☐	c. Analysis method?
			6 Review DMRs submitted Are DMRs filled out correctly?
☒	☐	☐	a. Is the permittee using all of the samples collected during the reporting period?
☒	☐	☐	b. Is the permittee reporting minimum and maximum data correctly?
☒	☐	☐	c. Is the permittee reporting 30-day average data correctly?
☒	☐	☐	d. Is the permittee reporting geometric mean data correctly?
☒	☐	☐	e. Is the permittee reporting the correct units?
☒	☐	☐	f. Is the permittee filling out the number of exceedance column correctly?
☒	☐	☐	g. Is the permittee filling out the sample frequency column correctly?
☒	☐	☐	h. Is the permittee using the correct NODI codes for parameters missing data?
☒	☐	☐	i. Is the permit signatory or an authorized signatory signing the DMRs?

Type of Signatory	Name	Title
Permit Signatory	Mark Wiggs	General Manager
Authorized Signatory	Charles Schulz	Environmental Coordinator
Authorized Signatory	Mark Gerwer	WW Facilities Manager

☒	☐	☐	7. Have all DMRs been submitted since the last inspection? If not, list missing DMRs.
☒	☐	☐	8. Have DMRs been submitted on-time?
☐	☒	☐	9. Has the permittee submitted Emergency Discharge Reporting Forms?
☐	☐	☒	a. Has the permittee filled out the form correctly?
☐	☐	☒	b. Has the form been entered into ICIS if applicable?

Discharge Monitoring Report Comments:
No emergency discharges have been reported.

Records Retention

Yes	No	N/A	
☒	☐	☐	1. Are the following records kept onsite for a minimum of 3 years?
☒	☐	☐	a. Inspection Records
☒	☐	☐	b. Calibration Records
☐	☐	☒	c. DMRs
☐	☐	☒	d. Emergency Discharge Reporting Forms
☒	☐	☐	e. Sample Results
☒	☐	☐	f. WET Lab Data
☒	☐	☐	g. Chain of Custody Forms
☐	☐	☒	h. PTD Records

Records Retention Comments:
All records are maintained and thorough.

Sampling and Laboratory Information

Insert Sampling Frequency Below				
Parameter	**Required Effluent**	**Actual Effluent**	**Onsite/Lab**	**Test Method and Detection Limits**
Ammonia	***3/ week***	***3/ week***	***AET***	***SM 4500-NH3 B***
BOD_5	***5/ week***	***5/ week***	***AET***	***SM 5210 B***
$CBOD_5$	***Monthly***	***Monthly***	***AET***	***SM 5210 B***
Dissolved Oxygen	***5/ week***	***5/ week***	***Onsite***	***EPA 360.1***
Fecal Coliform	***5/ week***	***5/ week***	***AET***	***Collert Quanti-Tray***
Nitrates	***Monthly***	***Monthly***	***AET***	***SM 4500-NO3 E***
Oil and Grease (sample)	***Weekly***	***Weekly***	***AET***	***EPA 1664B***
pH	***Daily***	***Daily***	***Onsite***	***EPA 150.1***
Flow Rate	***Continuous***	***Continuous***	***Onsite***	***Ultrasonic Flowmeter***
Total Suspended Solids	***5/ week***	***5/ week***	***AET***	***SM 2540 D***
Total Residual Chlorine	***Daily***	***Daily***	***Onsite***	***EPA 330.5***
Water Temperature	***5/ week***	***5/ week***	***Onsite***	***EPA 170.1***
Whole Effluent Toxicity (Chronic)	***1/ 6 months***	***1/ 6 months***	***WAMCO***	***Both Species***

Yes	No	N/A		
☐	☒	☐	1.	Does the permit require permission to discharge (PTD)?
☐	☐	☒		a. Is the permittee monitoring for all PTD parameters prior to discharge?
☐	☐	☒		b. Is the permittee requesting PTD?
☐	☐	☒		c. Has the permittee had problems meeting PTD requirements?
☒	☐	☐	2.	Are the minimum self-monitoring requirements of the permit met? If no, explain in comments
☒	☐	☐	3.	Are they sampling more than required and submitting all sample data?
☒	☐	☐	4.	Are samples collected at the location(s) described in the SWD permit?
☒	☐	☐	5.	Is the permittee using the method of sample collection specified in the permit?
☒	☐	☐	6.	If composite sampling is conducted, is the facility using flow proportioned sampling?
☒	☐	☐	7.	Do the methods used for collection, preservation, and analysis conform to 40 CFR?
☒	☐	☐		a. If composite sampling is conducted, is the sample refrigerated during sampling?
☒	☐	☐		b. Are the proper containers used for sample collection (see 40 CFR 136.3)?
☒	☐	☐		c. Are the samples shipped on ice (if needed)?
☒	☐	☐		d. Are the proper preservatives added to samples?
☒	☐	☐		e. Are the samples analyzed with in the proper holding time?
☒	☐	☐	8.	Does the facility have extra sample bottles/kits in case of an emergency discharge?
☒	☐	☐	9.	Is a written laboratory quality assurance manual available, if the facility conducts its own testing? When was the QA manual last updated: **Reviewed yearly and updated as needed.**
☒	☐	☐	10.	Is the pH meter properly calibrated? How often?
☒	☐	☐	11.	Is a pH calibration log maintained?
☒	☐	☐	12.	Does the pH calibration log contain all of the following information?
☒	☐	☐		a. Date and Time
☒	☐	☐		b. Initials or signature of person calibrating the meter
☒	☐	☐		c. 7 buffer reading
☒	☐	☐		d. 4 buffer reading
☒	☐	☐		e. Temperature of buffer

Yes	No	N/A		
☒	☐	☐		f. Buffer expiration date
☒	☐	☐	13.	Is pH analyzed within 15 minutes of sample collection?
☒	☐	☐	14.	Does the pH meter meet DENR specifications?
☒	☐	☐		a. Two point calibration?
☒	☐	☐		b. Temperature compensation?
☒	☐	☐		c. Does it read to two decimal places?
☒	☐	☐	15.	Are other laboratory instruments and equipment calibrated and maintained?
☒	☐	☐	16.	Is an off-site lab used for analysis of some or all sampling required? If so, indicate parameters and the laboratory in the table below.
☒	☐	☐	17.	Does the permittee follow appropriate chain of custody?
☒	☐	☐	18.	Is the permittee required to participate in a DMR QA study?
☒	☐	☐		a. Has the permittee met the DMR QA study deadlines?
☐	☒	☐		b. Has the permittee had a parameter not pass? If yes, provide details in the comment section.

Equipment Calibration Information				
Equipment	Parameter Analyzed	Calibration Frequency	Calibration Method	Calibration records present?
DO Meter	Dissolved oxygen	Weekly	Auto-Calibration	Bench Sheets
pH Meter	pH	Daily	4 su, 7 su buffers	Bench Sheets
TRC Meter	TRC	Before Use	Hach 8167	Bench Sheets
Flow Meter	Flow Rate	Monthly	Tested against physical flow meter	None Required

Parameters	***Ammonia, BOD, COD, Fecal Coliform, Nitrate, O&G, TSS***
Laboratory Name	***American Engineering and Testing, Inc. (AET)***
Address	***601 E. 48th Street North, Sioux Falls, SD 57104***
Contact	***Dan Hanson***
Phone	***(605)332-5371***

Self-Monitoring/Sampling Evaluation Comments:
The facility does internal process control sampling.

Whole Effluent Toxicity

Yes	No	N/A		
☒	☐	☐	1.	Is the permittee required to conduct Whole Effluent Toxicity testing as a requirement of the permit? ☐ **Acute** ☒ **Chronic**
☐	☒	☐	2.	Does the permittee have approved alternative testing methods?
☐	☐	☒		a. Is the permittee allowed to alternate species? Is documentation available?
☐	☐	☒		b. Is the permittee allowed to use a CO_2 overlay? Is documentation available?
☐	☐	☒		c. Is the permittee allowed to use EDTA? Is documentation available?
☒	☐	☐	3.	Does the permittee have the latest edition of testing methods or the Toxicity Training Tool (TTT)?
☒	☐	☐	4.	Does the permittee have a copy of South Dakota's *Guidance Document for Whole Effluent Toxicity (WET)*?

Yes	No	N/A		
☒	☐	☐	5.	Is the permittee submitting the correct Toxicity Test Reporting Forms?
☒	☐	☐	6.	Does the permittee follow appropriate sample preservation procedures?
☒	☐	☐		a. Are samples analyzed within 36 hours?
☒	☐	☐		b. Are samples sent on ice?
☒	☐	☐		c. If composite sampling is used, are the samples chilled during compositing?
			7.	Dilution water used? ☒ **Reconstituted water** ☐ **Receiving stream water**
☒	☐	☐	8.	Is the lab using the correct hardness for the dilution water?
☒	☐	☐	9.	Is the lab using the correct dilution series?
☒	☐	☐	10.	Has the permittee had WET violations or invalid tests since last inspection?
☐	☒	☐	11.	Has the facility conducted a TIE/TRE for WET violations?

Whole Effluent Toxicity Laboratory Information		
Name	***WAMCO Lab Inc***	***PACE Analytical***
Address	***864 S Spruce St, Casper, WY 82601***	***9608 Loiret Blvd, Lenexa, KS 66219***
Contact	***Elaine Gold***	***Brad Godwin***
Phone	***(307)266- 3252***	***(913) 563-1415***

Whole Effluent Toxicity Comments:
The facility failed a chronic WET test for Ceriodaphnia dubia in April 2019. The following Ceriodaphnia dubia retest was halted due to acute toxicity. The WET test was then retested again in June 2019 as a split sample with WAMCO labs and PACE and both passed.

Flow Measurement:

Primary Influent Flow Measurement

A. General

Yes	No	N/A		
			1.	Type of primary flow measurement device: ***24" Parshall Flume***
☒	☐	☐	2.	Is the influent flow measured before all return lines?
☒	☐	☐	3.	Are the proper flow tables used by facility personnel?
☒	☐	☐	4.	Is the flow measurement equipment adequate to handle expected ranges of flow rate?

B. Open Channel Primary Flow Measuring Devices

Flumes

Yes	No	N/A		
☒	☐	☐	1.	Is the flume located in a straight section of the open channel, without bends immediately upstream or downstream?
☒	☐	☐	2.	Is flow entering the flume reasonably well distributed across the channel and free of turbulence, boils, or other distortions?
☒	☐	☐	3.	Is the flume clean and free of obstructions, debris, or deposits?
☒	☐	☐	4.	Is flume head being measured at proper location? (Refer to NPDES compliance inspection manual or ISCO book for proper measuring location.)
☒	☐	☐	5.	Is the flume under free flow conditions at all times? (Flume is not submerged.)

Secondary Influent Flow Measurement

A. General

Yes	No	N/A		
			1.	Type of secondary measurement device: Ultrasonic Flowmeter
☒	☐	☐	2.	Are proper flow records maintained for the secondary device?
☒	☐	☐	3.	Is the secondary device calibrated? What is the frequency of device calibration?
☒	☐	☐	4.	Are secondary instruments properly operated, calibrated, and maintained?
☒	☐	☐	5.	Are flow measurements from secondary device within 10% of observed flow in primary?

Influent Flow Measurement Comments:
All flows to the WWTP combine before going through flume. The ultrasonic flowmeter is calibrated monthly.

Primary Effluent Flow Measurement

A. General

Yes	No	N/A		
			1.	Type of primary flow measurement device: ***Discharge to City- 9" Parshall River Discharge- 56" wide channel with 7.5" contractions for an overflow of 41" rectangular weir***
☒	☐	☐	2.	Is the effluent flow measured after all return lines?
☒	☐	☐	3.	Are the proper flow tables used by facility personnel?
☒	☐	☐	4.	Is the flow measurement equipment adequate to handle expected ranges of flow rate?

B. Open Channel Primary Flow Measuring Devices

Weirs

Yes	No	N/A		
☒	☐	☐	1.	Is the weir level?
☒	☐	☐	2.	Is the weir plate plumb and are top edges sharp and clean?
☒	☐	☐	3.	Is there free access for air below the nappe of the weir?
☒	☐	☐	4.	Is the upstream channel of the weir straight for at least four times the depth of water level, and free from disturbing influences?
☒	☐	☐	5.	Is the weir under free flow conditions at all times? (Weir is not submerged.)
☒	☐	☐	6.	Is the stilling basin of the weir of sufficient size and clear of debris?
☒	☐	☐	7.	Are head measurements properly made by facility personnel?
☒	☐	☐	8.	Is the weir free of leakage?

Secondary Effluent Flow Measurement

A. General

Yes	No	N/A		
			1.	Type of secondary measurement device: Ultrasonic Flowmeter
☒	☐	☐	2.	Are proper flow records maintained for the secondary device?
☒	☐	☐	3.	Is the secondary device calibrated? What is the frequency of device calibration?
☒	☐	☐	4.	Are secondary instruments properly operated, calibrated, and maintained?
☒	☐	☐	5.	Are flow measurements from secondary device within 10% of observed flow in primary?

Effluent Flow Measurement Comments:
The facility has the capacity to discharge to the city of Sioux Falls but has not had to recently. The facility has a 9" Parshall flume to measure flow to the city.
The ultrasonic flowmeter is calibrated monthly.

IV. Facility Compliance Review

Yes	No	N/A			
☐	☐	☒	1.	Has the facility discharged since the last inspection? If yes, list how many.	**Continuous**
☐	☒	☐	2.	Is the facility in compliance with all effluent limits since the last inspection?	
☐	☒	☐		a. Effluent BOD_5 violations. If yes, how many?	**7 DM and 1 30-day avg**
☐	☒	☐		b. Effluent TSS violations. If yes, how many?	**12 DM and 2 30-day avg**
☐	☒	☐		c. Effluent pH violations. If yes, how many?	**11 DM and 1 30-day avg**
☐	☒	☐		d. Effluent fecal coliform violations. If yes, how many?	**6 daily maximum**
☐	☒	☐		g. Effluent WET violations. If yes, how many?	**1 chronic**
☒	☐	☐		h. Other violations. If yes, list parameter and number of occurrences in comments.	
☒	☐	☐	3.	Has the permittee monitored as required since the last inspection?	
☒	☐	☐	4.	Has the permittee notified SDDENR of maximum and minimum permit violations within 24 hours of becoming aware of the violation?	
☒	☐	☐	5.	Has the permittee submitted a written report of the violation as required by the department?	
☒	☐	☐	6.	Has the permittee received warning letters or notices of violation since the last inspection?	

Facility Compliance Review Comments:
The facilities August 2018 violations lead to a water quality standards violation in the Big Sioux River.
The facility has received a NOV in November 2018 and September 2019.

V. Compliance Schedule

Yes	No	N/A		
☐	☒	☐	1.	Is the facility subject to a compliance schedule either in its permit or in an enforcement action? If yes, note date and type of action in comments.

Compliance schedule Comments:
The facility currently does not have a compliance schedule

VI. Stormwater

Industrial

Yes	No	N/A		
☒	☐	☐	1.	Is stormwater permit coverage required for the facility (based on SIC code)?
☒	☐	☐	2.	Does the facility have coverage under the industrial stormwater permit (or is stormwater language included in the surface water discharge permit)? Permit or No Exposure Number: **SDR00A023**
☒	☐	☐	3.	If the facility is required to have stormwater coverage, has a stormwater pollution prevention plan (SWPPP) been developed?
☒	☐	☐	4.	Is the SWPPP up-to-date and adequate for the facility?
☒	☐	☐		a. Personnel Responsibilities
☒	☐	☐		b. Site Map
☒	☐	☐		c. Inventory of Exposed Materials
☒	☐	☐		d. Risk Identification and Summary of Potential Pollutant Sources
☒	☐	☐		e. Pollutant Source Consideration
☒	☐	☐		f. Spills and Leaks
☒	☐	☐		g. Sampling Data
☒	☐	☐	5.	Has the facility conducted inspections at least semi-annually?
☒	☐	☐	6	Is the facility following good housekeeping practices?
☒	☐	☐	7.	Are stormwater inspections documented and include the certification statement? If no, explain.
☐	☒	☐	8.	Is a follow-up inspection needed?

Industrial Stormwater Comments:
Inspections are done monthly

Construction

Yes	No	N/A		
☒	☐	☐	1.	Is the treatment facility upgrading?
☒	☐	☐	2.	Is more than 1 acre of land disturbed?
☒	☐	☐	3.	Does the facility have a construction stormwater permit? Stormwater permit number: SDR10I477
☒	☐	☐	4.	Is a copy of the permit onsite?
☒	☐	☐	5	Is the facility following good housekeeping practices?
☒	☐	☐	6.	Does the facility have a SWPPP?
☒	☐	☐	7.	Is the SWPPP available for review?
☒	☐	☐	8.	Are inspections being conducted as required?
☒	☐	☐	9.	Are inspection records maintained and available for review?
☐	☒	☐	10.	Is a follow-up inspection needed?

Construction Stormwater Comments:
The facility has a construction stormwater permit for redoing stock yards and other general construction. The facility has 9.2 acres listed as disturbed area.

VII. Plant Operations

Yes	No	N/A		
☒	☐	☐	1.	Is standby power or equivalent provisions provided for the treatment facility?
☒	☐	☐	2.	Does the facility have an alarm system for power or equipment failures?
☒	☐	☐	3.	Have emergency procedures been established?
☒	☐	☐	4.	Is the facility adding chemicals during the treatment process?
☒	☐	☐	5.	Can the facility be bypassed (internal, total, etc.)? If yes, describe bypass procedures.
☐	☐	☒	6.	Has DENR has been notified of previous bypasses? List bypasses reported since last inspection.
☒	☐	☐	7.	Does the treatment facility have adequate capacity to protect against hydraulic overload?
☒	☐	☐	8.	Does the treatment facility have adequate capacity to protect against organic overloads?
			9.	How does the facility evaluate capacity? Organically- Daily COD sampling, Hydraulically- freeboard in anaerobic lagoons

Plant Operation Comments:
The Facility has 3 backup generators to run the plant in case of power loss. 2 diesels and 1 electric.
The facility has alarm systems on all parts of the treatment system.
The list of approved chemicals are as follows: Dixichlor Max (Bleach, Sodium Hypochlorite 12.5%), FloMagH (Magnesium Hydroxide Slurry, $Mg(OH)_2$), Hydrosolution 3D8030, Hydrosoliution 4A4839, Sodium Bisulfite 2% FG, Sodium Hydroxide 50%
Bypasses reported are as follows: Aug 17, 2017- classifier and Jan 16, 2018- classifier/bar screens, June and July 2019 diffusers in aeration basins.

VIII. Site Visual Inspection / Treatment Processes

Provide a general description of applicable treatment processes, along with comments relating to the operation, condition of equipment, observations, and any changes made since the last inspection.

General Appearance
The facility appears well-maintained and well-organized.

Safety Features

Yes	No	N/A		
☒	☐	☐	1.	Are procedures established for identifying out-of-service equipment? What are they?
☒	☐	☐	2.	Is personal protective equipment provided for employees (safety helmets, hearing protection, eye protection, gloves, rubber boots with steel toes)?
☒	☐	☐	3.	Are laboratory safety devices (eyewash and shower, fume hood, proper labeling and storage) available?
☒	☐	☐	4.	Does the plant have general safety features such as rails around or covers over tanks, pits, and wells?
☒	☐	☐	5.	Are portable hoists available for equipment removal?

Yes	No	N/A		
☒	☐	☐	6.	Are warning signs (no smoking, high voltage, watch-your-step, and exit) posted?
☒	☐	☐	7.	Are emergency phone numbers listed?
☒	☐	☐	8.	Is the plant generally clean and free from open trash areas?
☒	☐	☐	9.	Are SDS (MSDS), as applicable, accessible by employees?
☒	☐	☐	10.	Is there a fence or other barrier to prevent non-wastewater personnel from accessing the facility?
☐	☒	☐	11.	Do non-wastewater personnel have access to the facility?
☒	☐	☐	12.	Is there wastewater personnel onsite 24-hours a day; 7-days a week?
☒	☐	☐	13.	Are gates locked?
☒	☐	☐	14.	Are wastewater warning signs located at the treatment facility?

Safety Features Comments:
Lock-Out, Tag-Out
PPE is provided by the facility.
All people entering the facility must pass through the security check-in station.
There is always wastewater treatment facility staff onsite.

Treatment Units

Preliminary Treatment

Screening method: **Bar Screen**
Number of units: **2 (1 automatic/ 1 manual)**
Size (i.e. bar size/spacing):**3/4"**
Operated in series/parallel: **Parallel**
Cleaning/maintenance schedule: **2x a day**
Effluent destination: **Grit Removal (Grit Classifier)**
Removed material destination: **Landfill**
Comments: **Influent is normally run through automatic cleaning bar screen but can be run through manual if needed.**

Grit removal method: **Aerated Grit Chamber**
Number of units: **1**
Size: **12 MGD**
Cleaning/maintenance schedule: **As needed**
Effluent destination: **24" Parshall Flume**
Removed material destination: **Landfill**
Comments: **None**

Influent Flow Measurement: **24" Parshall Flume**
Secondary device: **Ultrasonic Flowmeter**
Effluent destination: **Rotary Screens**
Comments: **None**

Screening method: **Rotary Screens**
Number of units: **2**
Operated in series/parallel: **Parallel**

Cleaning/maintenance schedule: **Weekly**
Effluent destination: **Dissolved Air Flotation (DAF)**
Removed material destination: **Landfill**
Comments: **None**

Primary Treatment

Primary sedimentation: **DAF**
Number of units: **2**
Size: **15,250 gallons per unit**
Operated in series/parallel: **Parallel**
Cleaning/maintenance schedule: **Weekly**
Effluent destination: **City of Sioux Falls WWTF or anaerobic lagoon**
Removed material destination: **Belt filter press**
Comments: **The solids are dewatered and land applied in IA**

Anaerobic Lagoons
Number of units: **5**
Size: **16.7 MG total capacity**
Operated in series/parallel: **Parallel**
Cleaning/maintenance schedule: **As needed or every 20 years cleaned out**
Effluent destination: **Aerobic Basins normally but can be run to Lagoon Clarifier**
Comments: **The lagoons are run to also act as flow equalization. The freeboard is increased to 6.5' on Sunday due to lower flows on non-production day so through the week the freeboard will be lowered to 3.5'. Biogas is collected off the anaerobic lagoons and run boilers.**

Secondary Treatment

Aeration Basin
Number of units: **4 cells**
Size: **3.5 MG total capacity**
Operated in series/parallel: **Cells 1&2 are run in parallel and Cells 3&4 are run in series**
Cleaning/maintenance schedule: **Every 6 months**
Effluent destination: **Final Clarifiers**
Removed material destination: **Belt filter press- Land Application**
Return material destination: **Head of basin**
Comments: T**he diffusers in Cell #1 and Cell #2 were replaced in June and July of 2019. The diffusers are Hoffman fine bubble diffusers. There are 1,100 diffusers per cell. 11,300 cu. ft/ min aerator rating for the system.**

Secondary sedimentation method: **Circular Clarifier**
Number of units: **2**
Size: **297,700 gallons each**
Operated in series/parallel: **Parallel**
Cleaning/maintenance schedule: **Every 2 months**
Effluent destination: **30% Sand filters or 70% Chlorine Contact Chamber**
Removed material destination: **Belt filter press**
Return material destination: **Head of aeration basin**
Comments: **Total HRT of system is around 15 days.**

Tertiary Treatment

Filtration method: **Gravity filters**
Subtype: **Sand**
Number of units: **4**
Length: **15'** width: **15'** depth:**8'**
Operated in series/parallel: **Parallel**
Cleaning/backwashing/maintenance schedule: **Daily**
Effluent destination: **Chlorine Contact Basin**
Removed material destination: **Anaerobic Lagoon**
Comments: **None**

Disinfection method: **12.5% Sodium Hypochlorite**
Subtype components: **Contact Basin**
Dechlorination method: **Sodium Bisulfite**
Length: **54'** width: **25'** depth: **9.5'**
Operated seasonally or year-round: **Year-Round**
Cleaning/maintenance schedule: **4x a year**
Effluent destination: **Effluent Flow Weir**
Comments: **49 minutes of contact time at 2.9 MGD**

Effluent Flow Measurement: **41" Rectangular Weir with 7.5" end contractions**
Secondary device: **Ultrasonic Flowmeter**
Effluent destination: **Post Aeration**
Comments: **None**

Post Aeration:
Effluent destination: **Outfall 001 to Big Sioux River**
Comments: **16' x 20' basin with 1 blower and HRT of 12 min.**

Solids Treatment and Disposal

Solids treatment method 1: **Belt filter press**
Number of units: **2**
Operated in series/parallel (or configuration): **Parallel**
Cleaning/maintenance schedule: **Daily**
Disposal method: **Land application in IA**
Comments: **None**

Photo Log

Location:	Smithfield Foods
Date:	August 27, 2019
Staff Member:	Kyle Doerr

Figure 1: DAF

Figure 3: Post Aeration

Figure 2: Screw pumps to Grit Building

Figure 4: Outfall 001

Figure 5: Grit Classifier

Figure 6: Aerated Grit Chamber

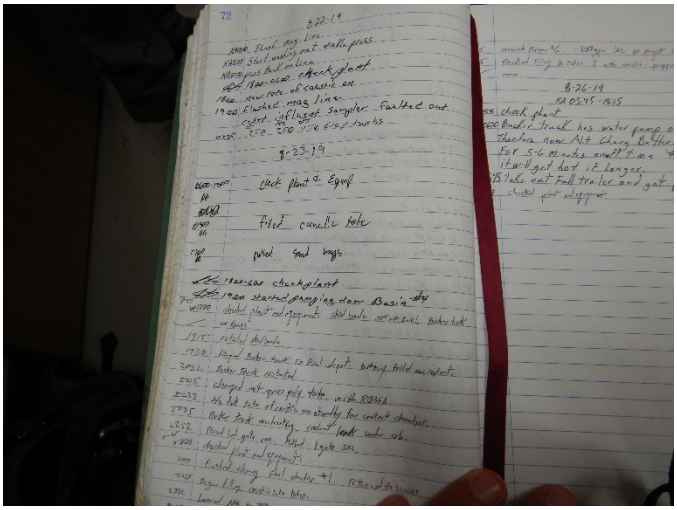

Figure 7: Maintenance Records

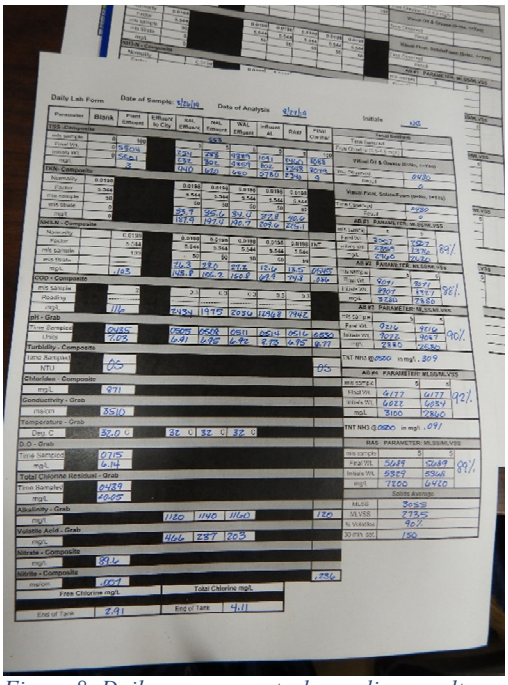

Figure 8: Daily process control sampling results

Figure 9: Rotoscreens

Figure 10: Aeration Basin

Figure 13: Belt filter press

Figure 11: Cell #1 of Aeration Basins

Figure 14: Biogas Boiler

Figure 12: Anaerobic Lagoon with feed line

Figure 15: Biogas collection building

Figure 16: Lagoon clarifier


Figure 19: Secondary Clarifier

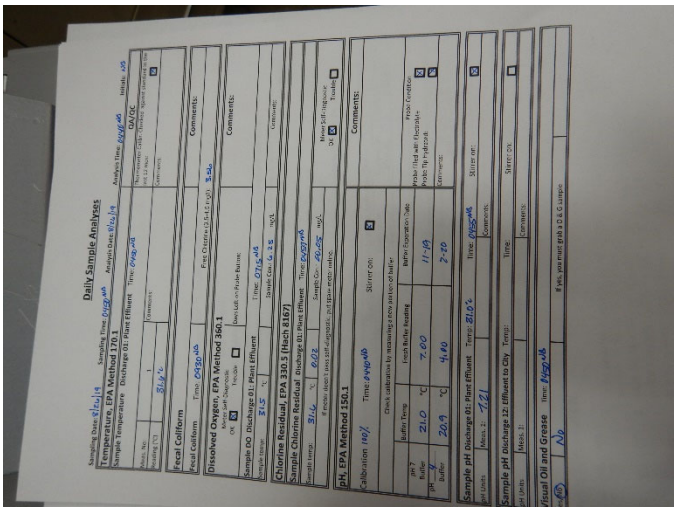

Figure 17: Calibration sheet

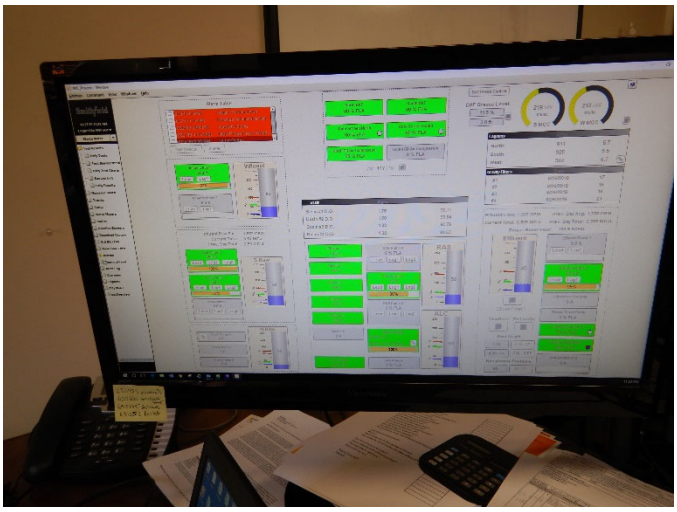
Figure 20: Control and Monitoring System


Figure 18: Contact Chamber

Attachment 1- DMR Calculation Forms

DMR Calculations Form

July 2019 DMR Check															
Date	Flow MGD	BOD mg/L	TSS mg/L	NH3 mg/L	Fecal #/100 mL	O&G mg/L	pH SU	TRC mg/L	DO mg/L	BOD Lbs/day	TSS Lbs/day	NH3 Lbs/day	O&G Lbs/day	Nitrates mg/L	Temp °C
07/01/2019	2.919	12.0	16.0	--	1.0	--	7.04	0.05	6.56	292.1	389.5	--	--	--	35.2
07/02/2019	2.551	7.5	4.8	0.65	5.0	--	6.80	0.05	5.93	159.6	102.1	13.8	--	--	33.1
07/03/2019	2.437	6.1	6.0	--	1.0	--	6.72	0.05	5.96	124.0	121.9	--	--	--	33.5
07/04/2019	1.930	8.5	11.0	0.92	1.0	1.0	7.00	0.05	5.91	136.8	177.1	14.8	16.1	--	34.0
07/05/2019	2.316	--	--	--	9.0	--	7.22	0.05	5.95	--	--	--	--	--	33.1
07/06/2019	2.500	--	--	--	--	--	6.95	0.05	--	--	--	--	--	--	--
07/07/2019	2.507	5.3	8.0	0.32	--	--	6.83	0.05	--	110.8	167.3	6.7	--	--	--
07/08/2019	2.576	6.6	10.0	--	1.0	--	6.71	0.05	6.11	141.8	214.8	--	--	--	33.0
07/09/2019	3.051	8.4	12.0	0.98	1.0	--	7.33	0.05	6.09	213.7	305.3	24.9	--	--	33.3
07/10/2019	2.694	13.0	19.0	--	1.0	--	6.85	0.05	6.10	292.1	426.9	--	--	--	33.5
07/11/2019	2.663	18.0	34.0	1.20	1.0	1.0	7.19	0.05	6.12	399.8	755.1	26.7	22.2	112	33.6
07/12/2019	2.655	--	--	--	1.0	--	7.04	0.05	5.77	--	--	--	--	--	32.4
07/13/2019	2.741	--	--	--	--	--	6.97	0.05	--	--	--	--	--	--	--
07/14/2019	2.648	12.0	22.0	1.30	--	--	7.04	0.05	--	265.0	485.9	28.7	--	--	--
07/15/2019	2.685	10.0	19.0	--	9.0	--	7.13	0.05	6.17	223.9	425.5	--	--	--	33.5
07/16/2019	2.473	16.0	39.0	0.99	50.0	--	7.09	0.05	6.13	330.0	804.4	20.4	--	--	33.8
07/17/2019	2.602	40.0	93.0	--	15.0	--	6.98	0.05	5.82	868.0	2018.2	--	--	--	33.4
07/18/2019	2.638	60.0	120.0	2.90	2.0	1.0	7.15	0.05	5.60	1,320.1	**2,640.1**	63.8	22.0	--	33.5
07/19/2019	3.226	370.0	1,180.0	31.00	1.0	--	7.15	0.05	5.73	**9,954.8**	**31,747.7**	**834.1**	--	--	32.6
07/20/2019	2.709	220.0	500.0	28.00	**241,960**	--	7.09	0.05	--	**4,970.5**	**11,296.5**	**632.6**	--	--	--
07/21/2019	2.716	36.0	110.0	8.50	**1,413,600**	--	7.31	0.05	--	815.5	**2,491.7**	**192.5**	--	--	--
07/22/2019	2.299	13.0	31.0	1.50	1.0	--	7.33	0.05	6.03	249.3	594.4	28.8	--	--	32.0
07/23/2019	2.396	9.5	15.0	0.83	1.0	--	7.34	0.05	6.00	189.8	299.7	16.6	--	--	32.2
07/24/2019	2.506	11.0	15.0	--	1.0	--	7.24	0.05	6.11	229.9	313.5	--	--	--	32.5
07/25/2019	2.388	9.8	12.0	0.96	1.0	1.0	7.38	0.05	6.28	195.2	239.0	19.1	19.9	--	32.7
07/26/2019	2.863	--	--	--	1.0	--	7.32	0.05	6.20	--	--	--	--	--	33.5
07/27/2019	1.561	--	--	--	--	--	7.51	0.05	--	--	--	--	--	--	--

July 2019 DMR Check															
Date	Flow MGD	BOD mg/L	TSS mg/L	NH3 mg/L	Fecal #/100 mL	O&G mg/L	pH SU	TRC mg/L	DO mg/L	BOD Lbs/day	TSS Lbs/day	NH3 Lbs/day	O&G Lbs/day	Nitrates mg/L	Temp °C
07/28/2019	2.726	13.0	22.0	1.10	--	--	7.33	0.05	--	295.6	500.2	25.0	--	--	--
07/29/2019	2.937	6.6	9.2	--	1.0	--	7.15	0.05	6.15	161.7	225.4	--	--	--	31.8
07/30/2019	3.027	5.8	4.8	0.77	1.0	--	7.14	0.05	6.18	146.4	121.2	19.4	--	--	31.6
07/31/2019	2.945	10.0	11.0	--	1.0	--	7.07	0.05	6.14	245.6	270.2	--	--	--	31.7
Limits	mg/L	mg/L	mg/L	mg/L	#/100 mL	mg/L	SU	mg/L	mg/L	Lbs/day	Lbs/day	Lbs/day	Lbs/day	mg/L	°C
Daily Max	N/A	N/A	N/A	N/A	400	10	9.00	0.019	N/A	1,849	2,200	102	N/A	N/A	N/A
Daily Min	N/A	N/A	N/A	N/A	N/A	N/A	6.50	N/A	5.00	N/A	N/A	N/A	N/A	N/A	N/A
30-Day Ave	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	667	1,100	58	352	N/A	N/A
Geo Mean	N/A	N/A	N/A	N/A	200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Results															
Daily Max	3.226	370.0	1,180.0	31.0	**1,413,600**	1.0	7.5	0.1	--	**9,954.8**	**31,747.7**	**834.1**	22.2	112	35.2
Minimum	--	--	--	--	--	--	6.7	--	5.60	--	--	--	--	--	--
30-Day Ave	2.609	37.12	92.95	5.12	--	--		0.05	--	**893.3**	**2,285.3**	**123.0**	20.1	112	33.0
Geo Mean	--	--	--	--	4.9	--	--	--	--	--	--	--	--	--	--
DMR Value															
Daily Max	3.226	370.0	1,180.0	31.0	**1,413,600**	1.0	7.5	NODI B	--	**9,954.8**	**31,747.7**	**834.1**	22.2	112	35
Minimum	--	--	--	--	--	--	6.7	--	5.60	--	--	--	--	--	--
30-Day Ave	2.609	37.1	93.1	5.12	--	--	--	--	--	**893.3**	**2,285**	**123**	20.1	112	33
Geo Mean	--	--	--	--	4.93	--	--	--	--	--	--	--	--	--	--

For Office Use Only			
Rating: ☒S ☐M ☐U	**Other: MOD ☐ ASSIST ☐ SEV ☐ ENF ☐**		
Name of Inspector	**Signature**	**Affiliation / Phone**	**Date**
Kyle Doerr		***SDDENR / (605) 773-3351***	**10/3/19**
Name of Reviewer	**Signature**	**Affiliation / Phone**	**Date**
Albert Spangler		***SDDENR / (605) 773-3351***	**10/3/19**