Scott A. Thompson
Executive Director

OKLAHOMA Environmental Quality

Kevin Stitt
Governor

April 2, 2024

Cindy Cantero, Water Pollution Control Manager
Water and Sewer Department
City of Tulsa
175 E. 2nd St. Suite 1400
Tulsa, Oklahoma 74103

Re: General Permit No. OKLAS240002 - Approved
One-Time Land Application of Biosolids
Tulsa Metropolitan Utility Authority Southside Wastewater Treatment Plant
Facility No. S-20402
OPDES Permit No. OK0026239

Dear Ms. Cantero:

The Oklahoma Department of Environmental Quality (DEQ), Water Quality Division (WQD) is enclosing the authorization to operate in compliance with General Permit No. OKLAS240002, for a one-time land application of biosolids from the Tulsa Metropolitan Utility Authority (Authority) Southside Wastewater Treatment Plant (WWTP). The biosolids from Digester No. 1 will be cleaned out, slurried, and pumped to the application area where a farm tractor pulling a multiple shank injector will be used to incorporate the biosolids. The Authority's application for this authorization was submitted to DEQ on April 2, 2024.

This authorization is approved in accordance with requirements of Oklahoma Administrative Code (OAC) 252:606, as adopted and promulgated pursuant to the Environmental Code, 27 Oklahoma Statute (O.S.) Supp. 2011.

The authorization is for a one-time application of biosolids to the following site:

Site 1: 95 acres located within the SW¼ of Section 7 and 25 acres located within the NW¼, NW¼ of Section 18, Township 18 North, Range 11 East of the Indian Meridian Creek County, Oklahoma.

The biosolids operation authorized by this document should be maintained in accordance with the DEQ General Permit. DEQ must approve any deviation from this Authorization in writing before changes can be made. I am returning a copy of the signed Authorization for your records. Please feel free to contact me at 405-702-8173 if you have any questions or concerns.

Sincerely,

David Mercer

David Mercer, P.E., District Engineer
Municipal Wastewater Enforcement Section
Water Quality Division
Oklahoma Department of Environmental Quality

Enclosure: As stated

DM/MM/hb CG/CB/EDD

cc: Amber Keller, ECLS, Tulsa DEQ Office
Dakota McNeil, ECLS, Regional Manager, DEQ
Ryan Broadhead, Production Manager, Nutri-ject Systems, Inc.

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
AUTHORIZATION FOR ONE TIME LAND APPLICATION OF SEWAGE SLUDGE
UNDER GENERAL PERMIT NO. GP-OK65S
AUTHORIZATION NO. OKLAS2400002

In compliance with Oklahoma Statute, 27A § 2-14-305 (2011) as amended, and the Rules of the Oklahoma Department of Environmental Quality (DEQ) promulgated thereunder, and in reliance on the certified statement and representation heretofore made in its application:

Tulsa Metropolitan Utility Authority
175 E. 2nd Suite 100
Tulsa, Oklahoma 74103
Facility No. S-20402

Is hereby authorized for a one-time land application of biosolids from the Tulsa Metropolitan Utility Authority Southside Wastewater Treatment Plant Digestor No. 1 to the following site:

Site 1: 95 acres located within the SW¼ of Section 7 and 25 acres located within the NW¼, NW¼ of Section 18, Township 18 North, Range 11 East of the Indian Meridian Creek County, Oklahoma.

whose site-specific and land application site conditions conform to and are in accordance with residuals characteristics, monitoring requirements and other conditions set forth in Part I of this Authorization.

Issuance of this Authorization in no way or in any respect affects the permittee's civil or criminal responsibilities regarding beneficial reuse of biosolids, except with respect to the permittee's legal responsibility under the Environmental Code and Rules promulgated by the Board of Environmental Quality to obtain this permit.

This Authorization is non-transferable and is granted summarily by and at the discretion of the Executive Director in accordance with applicable DEQ Rules and provisions of the above-referenced Permit.

This is to certify that the proposed beneficial reuse of biosolids set forth in this Authorization meets the requirements of the DEQ Rules, provided the permittee does not exceed the loading rates and/or metal concentrations set forth in this Authorization.

Issued this 2nd day of April 2024.

Myles Mungle, P.E., Engineering Manager
Municipal Wastewater Enforcement Section
Water Quality Division
Oklahoma Department of Environmental Quality

Note: Expiration date is upon completion of existing biosolids removal as described in the application.

PART I: MONITORING, LOADING RATES, METAL CONCENTRATIONS AND OTHER REQUIREMENTS.

SECTION A - MONITORING REQUIREMENTS

During the period beginning on the effective date and lasting through the expiration date of this Authorization, the Permittee shall monitor all land application of sewage sludge in accordance with the following schedule.

Pollutants shall be monitored at the frequency schedule(s) shown below:

Amount of Sewage Sludge* (Metric tons/365-day period)	**Frequency**
0 ≥ Sludge ≤ 290	Once/Year
290 ≥ Sludge ≤ 1,500	Once/Quarter
1,500 ≥ Sludge ≤ 15,000	Once/Two Months
15,000 ≥ Sludge	Once/Month

*The amount of bulk sewage sludge applied to the land (dry weight basis).

Representative samples of sewage sludge shall be collected and analyzed in accordance with the methods referenced in 40 C.F.R. § 503.8 (b) (2011).

The required monitoring results shall be retained for the period of the Authorization. The results shall be submitted to the Department as follows:

SAMPLING FREQUENCY	**REPORTING DEADLINE(S)**
Yearly	
January	February 28
Quarterly	
January, February, and March	April 28
April, May, and June	July 28
July, August, and September	October 28
October, November, and December	January 28
Bi-monthly	
January - February	March 28
March - April	May 28
May - June	July 28
July - August	September 28
September - October	November 28
November - December	January 28
Monthly Sampling	**Due the 28th of the following month**

SECTION B - LOADING RATES AND METAL CONCENTRATIONS

In addition to all other requirements and conditions of this General Permit, the Permittee is authorized to land apply sewage sludge only upon the condition that the pollutant ceiling concentration and cumulative pollutant loading rate shall not exceed the listed numerical limits.

Metal concentrations of sewage sludge - Sewage sludge shall not be applied to the land if the concentration of any of the pollutants exceeds the following pollutant concentrations:

TABLE 1	
Pollutant	**Ceiling Concentrations (milligrams per kilogram) ***
Arsenic	75
Cadmium	85
Copper	4300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7500

*Dry Weight Basis

Cumulative Pollutant Loading Rate Limits:

TABLE 2	
Pollutant	**Cumulative Pollutant Loading Rate (kilograms per hectare)**
Arsenic	41
Cadmium	39
Copper	1500
Lead	300
Mercury	17
Molybdenum	Monitor
Nickel	420
Selenium	100
Zinc	2800

All bulk sewage sludge which is applied to agricultural land, forest, or a reclamation site shall be treated by either Class A or Class B pathogen reduction requirements as defined in Part I Section 1.B.5 of the General Permit. The Permittee may land apply sewage sludge only during the effective date of this Authorization and shall immediately cease and desist any and all land application of sewage sludge made pursuant to such Authorization upon its expiration or at any time the required monitoring indicates that the cumulative loading rate is greater than the allowable rate set forth in this Authorization.

PART II: SPECIAL AND STANDARD CONDITIONS

SECTION A - SPECIAL CONDITIONS

1. There shall be no runoff or discharge from the land application site.

2. The commingling of sewage sludge with any other type of sludge or wastewater intended for land application is not allowed under this Authorization. Sludge which results from the commingling of sewage and any other additive shall not be land applied under this Authorization.

3. Special conditions and/or modification for specific land application sites will be included in the Authorization as necessary to protect the waters of the State.

4. When storage of sewage sludge is necessary, prior to land application, the sludge must be stored in a manner to prevent pollution to the waters of the State.

5. The Permittee is hereby given notice that this Authorization is in all respects subject to compliance with any and all applicable and relevant terms, conditions, provisions and requirements and any and all amendments of the laws of the State of Oklahoma and the Board of Environmental Quality's Rules. The absence of any express reference within this Authorization to any particular statutory requirement, rule(s) or standard(s) shall in no respect be deemed or construed to exempt or preclude the application of such requirement, rule(s) and standard(s) to this Authorization or the Permittee. By approval, grant and issuance of this Authorization, Permittee acknowledges receipt of true, correct, and current copies of the Board of Environmental Quality's rules (as amended) provided, however, that Permittee further acknowledges that any and all amendments thereto shall become part of this Authorization.

SECTION B - STANDARD CONDITIONS

1. Duty to reapply: If the Permittee wishes to continue an activity regulated by this Authorization after the expiration date of said Authorization, the Permittee must reapply for and obtain a new Authorization. Application for renewal shall be submitted at least ninety (90) days before the expiration date of the original Authorization. The Department may grant permission to submit a renewal application out of time but not later than the original Authorization expiration date.

2. Duty to provide information: The Permittee shall furnish to the Department, within reasonable time, any information which the Department may request to determine whether cause exists for modifying or revoking the Authorization, or to determine compliance with the Authorization.

3. Facilities operation: All facilities and equipment used by the Permittee shall be operated as efficiently as possible and be maintained in good working order so as to achieve compliance with the terms and conditions of this Authorization.

4. Right to entry: The Permittee shall allow any representative of the Department, upon presentation of credentials to a responsible person to:

    a. Enter upon the Permittee's premises where sewage sludge is being land applied or where any records are required to be kept under the terms and conditions of the permit.

b. At reasonable times have access to and copy any records required to be kept under the terms and conditions of this Authorization; to inspect any equipment utilized in the land application of the sewage sludge; to take photographs; and to sample the sewage sludge being land applied or the soil at the land application site.

c. Enter upon the Permittee's premises to examine and inspect any facilities and equipment covered under the terms of the permit.

5. Monitoring and reporting: All monitoring and reporting shall be in accordance with Part I, Section A of the Authorization.

6. Noncompliance notification: If, for any reason, the Permittee does not comply with or is unable to comply with any term(s) or condition(s) of the permit, the Permittee shall within five (5) days of becoming aware of such condition, provide the Department with the following information in writing:

Description of the noncompliance and the cause; and

the period of noncompliance, including exact dates and times; or, if not corrected the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncompliance.

7. Sludge application limitations: Sewage sludge shall not be applied to any site which is flooded, frozen, snow covered or within 10 meters of any water of the United States.

[EXTERNAL] Tulsa Southslope Digester #1 clean out

Ryan Broadhead <ryan@nutriject.com>

Wed 2/21/2024 1:07 PM

To:wqdbiosolids <wqdbiosolids@agency.ok.gov>
Cc:Toby Harden <Toby.Harden@deq.ok.gov>

1 attachments (3 MB)

Plan of Operations 2_7_2024.pdf;

We will be cleaning out the #1 digester from the city of Tulsa's Southslope plant. I am attaching our Plan of Operations. Please let me know if there is anything else you need from me.

Thank you,

Ryan Broadhead
HR/Project Manager
319-242-2548 - Cell

Nutri-Ject Systems Inc.
800-798-4205 - Office
319-988-3506 – Fax
www.NutriJect.com

NUTRI-JECT SYSTEMS, INC.
Tulsa OK Southslope Capital Equipment Replacement Project WPC23-4
SLUDGE MANAGEMENT PLAN

Prepared for
The City of Tulsa, OK
February 2024

Contractor
Nutri-Ject Systems, Inc.
515 5th St. PO Box 398
Hudson, IA 50643-0398
www.nutriject.com
ph: 800-798-4205
fax: 319-988-3506

PLAN OF OPERATIONS

PROJECT INFORMATION:

Application Name & Mailing Address	Nutri-Ject Systems, Inc. 515 5th St. - PO Box 398 Hudson, IA 50643
Contact Person	Ryan Broadhead Production Manager Phone 319-988-4205 Cell Phone 319-242-2548 Fax 319-988-3506
Facility Name & Location	City of Tulsa South Slope Wastewater Treatment Plant 5300 S. Elwood Ave. Tulsa, OK 74107
NPDES Permit Numbers	N/A
Description of Portion of Facility to have biosolids removed	Digester #1 at WWTP Approximately 1,250,000 gallons.
Approximate Start Date	February 28, 2024
Approximate Completion	2.0 – 3.0 Weeks

PROJECT PERFORMANCE CRITERIA:

Authorization to Commence Work

Prior to cleaning the wastewater digesters, the Oklahoma Department of Environmental Quality and the appropriate district office will be notified for permission received to proceed.

Biosolids Removal and Land Application Approval

Biosolids disposal shall be in conformity with the EPA 40 CFR Part 503 regulations. Testing of the biosolids and completing and filing the appropriate biosolids disposal and reuse forms prior to and after the cleaning operation are required.

Oklahoma Department of Environmental Quality
Mr. Toby Harden
707 N. Robinson PO Box 1677
Oklahoma City, OK 73101-1677
Phone: 405-702-8109
Email: toby.harden@deq.ok.gov

Required Equipment

Cleaning Equipment

Chopper Pump, Fire Hose and Nozzles, Lay Flat Hose,

Confined Space PPE – Retrieval System, Air Repair System, Gas Meters

Transportation Equipment

Up to (4) 6,000 gallon Semi-tanker trucks, Load Stand

Land Application Equipment

IH MX 285, 6,000 gallon vacuum pressure Huskey tank and toolbar or a cord system tool bar supplied by a high pressure pump.

Removal of biosolids

All material will be pumped out of the digester using a chopper pump. Rigid hose in the digester and lay-flat hose outside of the digester will carry material to a load stand where transport semis can be loaded. Tanker semis drive the material to the land application site and unload to the applicator tank in the field. The material will then be surface applied at proper agronomic rates based upon nitrogen uptake of the crop being grown in 2024.

Project Approach

On a project of this nature, we would have a full-time project manager to coordinate all phases of the removal, transportation, and application operation with the wastewater treatment plant residuals coordinator, farmers, and land owners. Our project manager will assure that the solids are removed and land applied to assure compliance with vector attraction. The project manager would also be responsible for making sure that all solids are tested and recorded, as well as the quality control at the field site to maintain accurate application with daily records forwarded to the City residuals coordinator on a daily basis. All of our project managers have a farm background, as do our applicator operators. This assures

the customer of good farm practices being followed in every field. Our project manager will determine when and where to apply any needed dust control agent on the haul roads to eliminate all complaints due to dust. We typically apply dust control agents prior to the beginning of hauling and again when we are completed with the project as a good public relations tool.

Land Application Procedures

The biosolids will be transported and land applied at proper agronomic rates on suitable farm land within 20.0 miles of the treatment site.

– 120 Acres Available

PLSS: SW ¼, Sec. 7, T18N, R11E and NW ¼, NW ¼, Sec. 18, T18N, R11E

Prevention of Biosolids Spills and Reporting Spills

Any spillage of biosolids must be reported immediately to the Oklahoma Department of Environmental Quality and the contractor will be responsible for all cleanup costs.

Preliminary Spill Prevention Plan

We have the largest fleet of equipment in the Upper Midwest for the removal, transportation, and application of biosolids. We have a full line of pumps, dredges, tractors, loaders, liquid tankers, solid monitoring equipment, and applicators for both liquid and dry cake application. Our company shares the building with Municipal

Pipe Tool Co., Inc., has 5 Camel combination vacuum/jet machines which could be dispatched should a large spill ever occur.

SAMPLING, RECORDS AND REPORTS

Liquid Biosolids Removal Operations

The contractor will be responsible for daily on-site total solids sampling of the removed liquid biosolids to determine the net dry tons of solids removed daily.

The contractor will be responsible for taking at least one composite sample from each semi-trailer with a composite sample to be analyzed for solids at 4-hour intervals. Split samples may be obtained by the owner at any time for testing purposes. These samples will be used to verify agronomic land application rates.

The basis for payment will be:

Daily % solids average x wet tons hauled = Net dry ton or lump sum or by the gallon or lump sum.

Daily records must be maintained in accordance with EPA 503 biosolids application regulations. These records assure that the Approved Agronomic Loading Rates (APLR) are followed and surface and groundwater sources are not contaminated.

Daily records of the biosolids application will be maintained using diagrams of biosolids application site and reports containing biosolids loading rate data which includes the following information:

Dates of biosolids application
Volume of biosolids disposed (NDT/day)
Area of coverage (acres)
Application rates (NDT/acre)

A final report containing information specified above will be submitted to the owner/engineer and the Oklahoma Department of Environmental Quality.

Owner Responsibilities: The owner will be responsible for providing ingress and egress to work site. The contractor shall have access to the application site between 7:00 am to 7:00 pm.

Contractor Responsibilities

The contractor will obtain and analyze biosolids samples and provide information concerning biosolids removal and application as specified within this document.

The contractor shall provide all removal and related equipment for transports, and power equipment to remove the accumulated biosolids. The contractor shall provide all necessary transport and pull type biosolids application equipment necessary for the application of the liquid biosolids.

The contractor shall be responsible for verifying biosolids volumes and characteristics to his satisfaction and shall be responsible for applying biosolids in conformance with the maximum loading and application rates. It is the contractor's responsibility to fully observe the indicated sites and to determine the best and most effective means of removing and applying the biosolids. The contractor's proposed methods shall be evaluated and approved by the ODEQ.

The contractor will be responsible for any spilled biosolids during removal and application activities and shall be responsible for immediate cleanup of any spilled biosolids on the plant site and roadways. All cleanup expenses shall be the responsibility of the contractor. The contractor shall also avoid application of biosolids when the threat of rainfall could cause surface runoff. Upon completion of the project, any runoff prevention measures shall be removed and the site restored to the pre-existing condition.

The contractor shall comply with all EPA and ODEQ regulations affecting the removal and land application of biosolids. The contractor will be responsible for preparing field application reports for the application site. Completion of required waste disposal documents and compliance with all applicable federal, state, and local regulations regarding the land application of wastewater biosolids.

The contractor will keep their equipment in good operating condition at all times. All maintenance will be done at the contractor's expense. The owner's facilities will not be used for equipment maintenance except as previously agreed upon by the contractor and owner.

Cost of utilities and their installation and hookup will be born by the contractor unless previously and otherwise agreed to in writing by the owner.

At the conclusion of biosolids application activities, the facility shall be returned to normal operations as a requirement for the completion of this project. Any damage caused by the contractor to property or equipment of the City shall be repaired or replaced at the contractor's expense. Fences or gates that were removed or damaged to facilitate access onto the application sites must be replaced, to the owner's satisfaction, immediately after biosolids application operations. Any holes or tracks caused by heavy equipment will be filled and smoothed over and re-seeded as necessary.

Nutri-Ject Systems, Inc.

PO Box 398
Hudson, IA 50643

Pre-Application Biosolids Field Report

City	**Tulsa, OK**
Farmer / Land Owner	
Location	
Dates Applied	**Pre-Application**
Gallons	1,250,000
Acres	100

Digester #1

2024

grass **Analysis** 1/9/2024

Lbs / Acre		Lbs N per DT			
	lbs/acre			2.12	**DT/Acre**

	Lbs / Acre		Lbs N per DT		
Applied Nitrogen	135.10		63.68		
	Lbs / Acre		**Analysis %**		
Phosphorus	92.9	*lbs/acre*	2.19	4242.98	*Lbs per acre*
Potassium	13.58	*lbs/acre*	0.32	4242.98	*Lbs per acre*
Dry Ton per Acre	2.1215			4.1%	*% solids x wet ton/acre*
LBS per Acre	4243.0			4.1%	*% solids x wet ton/acrex2000*
Solids %	4.07%				*% solids x wet ton/acre*
Total DT	212.15				

	Lbs/Acre	mg/kg	analysis 1/9/24			EPA Ceiling mg/kg	lab results
Arsenic	0.1061	25.0	*OK*	2.12	*dt/acre*	75	
Cadmium	0.0106	2.5	*OK*	2.12	*dt/acre*	85	
Copper	3.6659	864	*OK*	2.12	*dt/acre*	4300	
Lead	0.2809	66.2	*OK*	2.12	*dt/acre*	840	
Mercury	0.0027	0.647	*OK*	2.12	*dt/acre*	57	
Molybdenum	0.0696	16.4	*OK*	2.12	*dt/acre*	75	
Nickel	0.1256	29.6	*OK*	2.12	*dt/acre*	420	
Selenium	0.0700	16.5	*OK*	2.12	*dt/acre*	100	
Zinc	4.3703	1030	*OK*	2.12	*dt/acre*	7500	

Special comments about project or fields:
Mercury had to be converted to mg/kg from ug/kg 1-9-24. Analysis 647 ug/kg = .647 mg/kg
Approved Loading rate per MANA rate chart

Gallons Per Acre	12500		
Application Method	surface		
Ft. per applicator load	1742	1.9 mph	
PH	7.68	OK	
Coliform Fecal geo mean:	23.0 CFU/g dry	OK	
Sour Test			
Soil pH	5.7 Avg	OK	
Soil N, ppm	12.07 Avg. ppm	OK	
Applicator Loads to Field		at 6000	

Cumulative		EPA Max. Load Rate
Arsenic	0.1061	**36 lbs./acre**
Cadmium	0.0106	**34 lbs/acre**
Copper	3.6659	**1335 lbs.acre**
Lead	0.2809	**267 lbs/acre**
Mercury	0.0027	**373 lbs./acre**
Molybdenum	0.0696	**15 lbs/acre**
Nickel	0.1256	**66 lbs.acre**
Selenium	0.0700	**89 lbs/acre**
Zinc	4.3703	**2490 lbs/acre**

BIOSOLID APPLICATON DATA

Analysis **1/9/2024** **Tulsa, OK** **2024**

Step 1-- Determine carryover nitrogen from last year's sludge application

Digester #1

% Organic N =	0	---	0	=	0	1
	% Kjeldahl N		% Ammonia N*		% Organic N	

(*use last years analysis)

Carryover N =	0	x	0	=	0	2
lbs. N/acre	% Organic N		Dry tons / Acre**		Carryover N	

(**last years application rate)

Step 2-- Determine available nitrogen in this year's sludge

% Organic N =	5.79	---	2.53	=	3.26	3
	% Kjeldahl N*		% Ammonia N*		% Organic N	

(* use recent analysis)

	3.26	x	4	=	13.04	4
	% Organic N (3)		Factor I			
	2.53	x	20	=	50.6	5
	% Ammonia N		Factor II			
	0.002	x	20	=	0.04	6
	% Nitrate N					

Available N in Sludge =	13.04	+	50.6	+	0.04	=	63.68
(lbs N / dry ton)	4		5		6		Available N

Factor I = 4 for digested sludges
6 for chemically or physically stabilized or unstabilized sludges

Factor II = 10 for surface applied sludges
15 for injected or immediately incorporated sludges

Step 3-- Determine crop nitrogen credits

Fertilizer N in lbs/acre =	0	8
Manure N applied in lbs./ acre =	0	9

Nitrogen Credits =	0	+	0	+	0	=	0
(lbs N / acre)	Carryover N (2)		Fertilizer N (8)		Manure N (9)		N Credits 10

Fecal Coliform Class II biosolids

PSRP

Project Site: **Tulsa, OK**

Lab Name: **Accurate Environmntal Labs**

Lab Site: Stillwater , OK

Sample Date: 1/9/2024

	analysis result		
Sample #1	1.0	CFU/g dry	below quantitation limit
Sample #2	881	CFU/g dry	
Sample #3	1.0	CFU/g dry	below quantitation limit
Sample #4	136	CFU/g dry	
Sample #5	1.0	CFU/g dry	below quantitation limit
Sample #6	444	CFU/g dry	
Sample #7	68	CFU/g dry	
GEO Mean	**23**	CFU/g dry	

2024 BIOSOLIDS MANAGEMENT

AGRONOMIC RATE CALCULATION WORKSHEET

PRE-APPLICATION

PASSWORD: SLUDGE

	Tulsa, OK		
	Biosolids Source:	**Digester #1**	
LANDOWNER/OPERATOR:			2024

INPUT BIOSOLIDS PARAMETERS

Parameter	**Concentration**	Analysis Date	**1/9/2024**	
Total Kjeldahl Nitrogen	57,900	mg/Kg dry wt.		
Nitrate Nitrogen	19.7	mg/Kg dry wt.		
Ammonia Nitrogen	24,300	mg/Kg dry wt.	NOTE: THE BIOSOLIDS AND SOIL PARAMETER INPUTS ARE	
Phosphorus	21,900	mg/Kg dry wt.	TAKEN FROM TEST RESULTS OF A CERTIFIED LABORATORY.	
Potassium	3,200	mg/Kg dry wt.		
Sodium		mg/Kg dry wt.		
pH, extractable	7.68			
Total Solids, %	4.1			

INPUT METALS PARAMETERS (Ceiling Concentration)

Metal	**Concentration**	Avg. 6/12/13,8/13/13,10/8/13	**Ceiling Limit, mg/kg dry wt.**	**Analysis 1/9/2024**
Arsenic	25	mg/Kg dry wt.	75.00	OK
Cadmium	2.5	mg/Kg dry wt.	85.00	OK
Chromium	221	mg/Kg dry wt.	NR	OK
Copper	864	mg/Kg dry wt.	4300.00	OK
Lead	66.2	mg/Kg dry wt.	840.00	OK
Mercury	0.647	mg/Kg dry wt.	57.00	OK
Molybdenum	16.4	mg/Kg dry wt.	75.00	OK
Nickel	29.6	mg/Kg dry wt.	420.00	OK
Selenium	16.5	mg/Kg dry wt.	100.00	OK
Zinc	1030	mg/Kg dry wt.	7500.00	OK
			Mercury lab result 647 ug/kg dry coverted to .647 mg/kg dry	

PATHOGEN DENSITY DETERMINATION (Geometric Mean Calculation)

1.)	1	CFU/g TS		
2.)	881	CFU/g TS		
3.)	1	CFU/g TS	PATHOGEN DENSITY (CFU/g TS)	STANDARD, CLASS B, (CFU/g TS)
4.)	136	CFU/g TS	**23.20**	**≤ 2,000,000**
5.)	1	CFU/g TS	OK	
6.)	444	CFU/g TS		
7.)	68	CFU/g TS	Analysis Date 1/9/2024	
GEOMETRIC MEAN =	23.20			

VECTOR ATTRACTION REDUCTION COMPLIANCE

Standard Oxygen Uptake Rate	**Standard**
	≤ 1.5 mg 02/g TVS/HR
Volatile Solids Reduction	
	≥ 38%
Incorporation	

			SITE NO:	Pete Sellers
			Biosolids Source:	Digester #1

INPUT SOIL PARAMETERS

Depth of sample	6.00	inches (use 6" unless injecting deeper, then use injection depth plus 2 inches)		
Nitrate	12.10	mg/Kg	Avg. 3 Samples. 13, 7.9, 15.3, ppm	Sample Date 1/22/24
Phosphorus	6.00	mg/Kg	Avg. 3 Samples. 9, 3, 6, ppm	
Potassium	104.00	mg/Kg	Avg. 3 Samples. 163, 65, 85, ppm	
pH	5.70		Avg. 3 Samples. 6.0, 5.4, 5.7 pH	

INPUT CROP INFORMATION

		CROP	CROP FACTOR
		Wheat	1.75 lbs N/bushel
Crop to be planted:	Brome Grass	Corn	1.35 lbs N/bushel
Expected Yield =	4.00	Oats	1.15 lbs N/bushel
Crop Factor =	40.00	Grain Sorghum/Milo	1.35 lbs N/bushel
Soil Factor =	1.00	Barley	1.50 lbs N/bushel
		Soybeans	5.40 lbs N/bushel
		Alfalfa	56 lbs N/ton
		Orchard Grass	50 lbs N/ton
		Brome Grass	40 lbs N/ton
		Sunflowers	50 lbs N/1000 lbs seed
Available Acreage of Site =	100	Tall fescue	39 lbs N/ton
		Forage Sorghum	9 lbs N/ton

		SOIL TYPE	SOIL FACTOR
		Sandy	1.10
		All Others	1.00

INPUT PREVIOUS LEGUME CROP AND BIOSOLIDS LOADING

			Legume Crop	Nitrogen Credit
			Alfalfa	1st yr after
			>80% stand	100 - 140 lbs/acre
Legume nitrogen credit	0.00	lbs/acre	50 - 80% stand	60 - 100 lbs/acre
			<60 % stand	0 - 60 lbs/acre
			Alfalfa	2nd yr after
				Half of 1st year credit
			Sweet Clover	100 - 120 lbs/acre
			Red Clover	40 - 80 lbs/acre
			Soybeans	30 - 60 lbs/acre
			Allow 1 pound of N credit per bushel of yield for soybeans	

NO CREDIT FOR WHEAT DOUBLE CROPPED AFTER SOYBEAN HARVEST

INPUT NITROGEN CREDIT FOR PREVIOUSLY APPLIED BIOSOLIDS

Last year's Current Available Org. - N	0.00	lbs./dry ton	
Last year's Biosolids Loading Rate	0.00	dry tons/acre	

			SITE NO:	Pete Sellers
			Biosolids Source:	Digester #1

AVAILABLE NITROGEN CONCENTRATION OF BIOSOLIDS

NITROGEN CONCENTRATIONS:		
TKN-N	115.80	lbs./dry ton
NH_4-N	48.60	lbs./dry ton
NO_3-N	0.04	lbs./dry ton
ORG-N	67.20	lbs./dry ton
Total Phosphorus (sludge) =	21,900.00	mg/Kg dry wt.
AVAILABLE NITROGEN:		
Input Kv Factor From Table;		
Kv =	1.00	
Input F Factor From Table;		
F=	0.20	
Current Avail. ORG.-N	13.44	lbs./dry ton
Current Avail. Total Nitrogen	62.08	lbs./dry ton
(=CurrentAvail.Org-N + Nitrate-N + Ammonia.-N(Kv))		
Total Nitrogen Credits	21.78	lbs./acre
Crop Nitrogen Need	180.00	lbs./acre

Kv Table	
If Biosolids are:	Kv=
Liquid Surface Applied	0.25
Liquid Incorporated	1.0
Dewatered	1.0

F Table	
If Biosolids are:	F=
Digested Primary &WAS	0.40
Aerobically Digested	0.30
Anaerobically Digested	0.20
Composted	0.10

CONCENTRATION OF OTHER BIOSOLIDS PARAMETERS

Phosphorus	43.80	lbs./dry ton
Potassium	6.40	lbs./dry ton
Sodium	0.00	lbs./dry ton
Arsenic	0.05	lbs./dry ton
Cadmium	0.01	lbs./dry ton
Chromium	0.44	lbs./dry ton
Copper	1.73	lbs./dry ton
Lead	0.13	lbs./dry ton
Mercury	0.00	lbs./dry ton
Molybdnenum	0.03	lbs./dry ton
Nickel	0.06	lbs./dry ton
Selenium	0.03	lbs./dry ton
Zinc	2.06	lbs./dry ton

			SITE NO:	Pete Sellers
			Biosolids Source:	Digester #1

BIOSOLIDS LAND APPLICATION LOADING RATES

AGRONOMIC LOADING RATE	2.55	dry tons/acre
APPROVED LOADING RATE	3.06	dry tons/acre
	75.15	wet tons/acre
	92.77	cubic yards/acre
	18,020.41	gallons/acre

LOADING RATE TRACKING

APPROVED LOADING RATE		
CAKE	92.77	cubic yards/acre
LIQUID	18,020.41	gallons/acre
	3.06	dry tons/acre

BIOSOLIDS PARAMETER LOADING AT APPROVED LOADING RATES

PARAMETERS	LOADING @ APPROVED RATE (lbs/acre)	CUMULATIVE LIMITS (lbs/acre) (LIFE OF SITE)	SITE LIFE @ APLR (years)
Total Available N	189.86	0	NA
Current Org - N Available	41.10	0	NA
Phosphorus	133.96	0	NA
Potassium	19.57	0	NA
Sodium	0.00	0	NA
Arsenic	0.15	36	235
Cadmium	0.02	34	2223
Chromium	1.35	0	NA
Copper	5.28	1320	250
Lead	0.40	264	652
Mercury	0.00	15	3790
Molybdnenum	0.10	16	159
Nickel	0.18	370	2044
Selenium	0.10	88	872
Zinc	6.30	2464	391

			SITE NO:	Pete Sellers
			Biosolids Source:	Digester #1

CUMULATIVE LOADING WORKSHEET (CAKE SOLIDS)

CUMULATIVE LOADING = ENTER DATE APPLIED AND CUBIC YARDS APPLIED

DATE APPLIED	CUBIC YARDS APPLIED	CUMULATIVE LOADING	% OF APLR
CUMULATIVE LOADING TO DATE (CY)	0.00		
PERCENT OF APLR (%)	0.00%		

CUMULATIVE LOADING WORKSHEET (LIQUID)

CUMULATIVE LOADING = ENTER DATE APPLIED AND GALLONS APPLIED

DATE APPLIED	GALLONS APPLIED	CUMULATIVE LOADING	% OF APLR
CUMULATIVE LOADING TO DATE (CY)	0.00		
PERCENT OF APLR (%)	0.00%		

			SITE NO:	Pete Sellers
			Biosolids Source:	Digester #1

ACTUAL AND ANNUAL LOADING

PARAMETER	ACTUAL LOADINGS (LBS/ACRE)		LOADING @ APLR (lbs/acre)	MAXIMUM CUMULATIVE LOADING RATE (lbs/acre)
	cake solids	liquid		
Nitrogen	0.00	0.00	189.86	
Phosphorus	0.00	0.00	133.96	
Potassium	0.00	0.00	19.57	
Zinc	0.00	0.00	6.30	2464
Arsenic	0.00	0.00	0.15	36
Cadmium	0.00	0.00	0.02	34
Chromium	0.00	0.00	1.35	0
Copper	0.00	0.00	5.28	1320
Lead	0.00	0.00	0.40	264
Mercury	0.00	0.00	0.00	15
Molybdnenum	0.00	0.00	0.10	16
Nickel	0.00	0.00	0.18	370
Selenium	0.00	0.00	0.10	88

Accurate Environmental Laboratories

January 31, 2024

Client: Nutri-Ject Systems, Inc.

515 W. 5th St. Box 398

Hudson, IA 50643

Requested By: Ryan Broadhead

National Environmental Laboratory Accreditation Program
ODEQ TNI Certified

Sample Project Name:	Tulsa South Digester
Date Samples Received:	January 09, 2024 Time: 10:35 sample temp upon arrival at lab = 13.40°C - On Ice
Matrix:	Sludge
Lab Log Numbers:	**GA09032-01 GA09032-02 GA09032-03 GA09032-04 GA09032-05 GA09032-06 GA09032-07 GA09032-08**
Work Order:	GA09032
Report #	GA09032-0131240904
EPA Lab ID#'s:	**Stillwater OK00092 Tulsa OK00983 OKC OK00129 ICR OK 001**
Oklahoma Certification:	Stillwater NELAP WasteWater, ODEQ 8316/ Drinking Water, DEQ D9602 NELAP Tulsa WasteWater, ODEQ 9905 / Drinking Water, DEQ D9901 Oklahoma City NELAP WasteWater ODEQ 7202 / Drinking Water, DEQ D9937
Kansas Certification:	Stillwater NELAP CERT # E-10219
Method Reference:	40 CFR 136, 141, and 261 Methods for Chemical Analysis of Water and Wastes EPA-600/4-79-020, March 1983. Test Methods for Evaluating Solid Wastes, SW-846, Final Update VI. Standard Methods 2005 (21st Edition), Standard Methods 2011 (22nd Edition), Standard Methods 2017 (23rd Edition) for the Examination of Water and Wastewater.
Analysis Reference:	If qualifiers present in "Prep Info" or "Analysis Info", then analysis performed as follows: @= Tulsa Lab and * = OKC Lab. If no qualifiers present, then analysis performed at Stillwater Lab.

Accurate Environmental Laboratories certify that the test results performed meet all requirements of TNI. Any exceptions to this can be found in the report notes, Quality Control section, or Method/Parameter section of the report.

- No cert. = Laboratory does not carry certifcation for this method/analysis.
- Non-TNI = Laboratory has state certification but method does not fall under TNI certification.

This report is to only be replicated in its entirety.

Revised or Amended reports supersede all previous reports.

Accurate Environmental sampling protocol was followed for any sampling performed by Accurate Field Services.

Field accreditation certification only applies to wastewater analysis. Field analysis for drinking water methods are not offered as part of the ODEQ's field certification program.

Sample: ***TO#1*** **Location Code:** **PWSID#:**

Collection Type: Composite Start Date: 1/9/24 9:48 End Date: 1/9/24 9:48 **Lab Log#** GA09032-01

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Ammonia, Total SM4500NH3 C	Ammonia as N	25300 mg/kg dry		0.75	01/10/24 14:00 RND	01/10/24 17:56 RND
pH in Lab EPA 9045D	pH	7.68 pH Units	#03	0.0100	01/15/24 16:00 JGB	01/15/24 16:24 JGB
Phosphorus (P), Total - EPA 365.1	Phosphorus	21900 mg/kg dry		12.5	01/17/24 10:34 KRH2	01/17/24 16:10 KRH2
S.O.U.R. SM2710 (No Cert.)	Specific Oxygen Uptake Rate	5.59 (mg/g)/hr		0.0001	01/25/24 08:45 OHB	01/25/24 16:25 OHB
Temperature SM2550 B	Temperature	21.1 °C			01/15/24 16:00 JGB	01/15/24 16:24 JGB
Total Volatile Solids EPA 160.4	Total Volatile Solids	68.9 %		0.10	01/12/24 10:31 AJH	01/12/24 16:42 AJH
Nitrate EPA 300.0	Nitrate as N	19.7 mg/kg dry		5.00	01/10/24 17:23 RND	01/11/24 05:06 RND
Solids, Percent SM2540 B	Percent Solids	4.07 %		0.100	01/12/24 10:31 AJH	01/12/24 15:42 AJH
Kjeldahl Nitrogen SM4500Norg C	Total Kjeldahl Nitrogen	57900 mg/kg dry		2.00	01/12/24 09:40 RND	01/12/24 15:52 RND
Arsenic (As) EPA 6010B	Arsenic	BPQL mg/kg dry		25.0	01/17/24 09:00 SAK	01/18/24 12:44 SAK
Cadmium (Cd) EPA 6010B	Cadmium	BPQL mg/kg dry		2.50	01/17/24 09:00 SAK	01/18/24 15:49 SAK
Chromium (Cr) EPA 6010B	Chromium	221 mg/kg dry		12.5	01/17/24 09:00 SAK	01/18/24 15:49 SAK
Copper (Cu) EPA 6010B	Copper	864 mg/kg dry		12.5	01/17/24 09:00 SAK	01/18/24 12:44 SAK
Lead (Pb) EPA 6010B	Lead	66.2 mg/kg dry		25.0	01/17/24 09:00 SAK	01/18/24 12:44 SAK
Mercury (Hg) EPA 7471A	Mercury	647 ug/kg dry		10.0	01/12/24 08:30 SAK	01/12/24 14:19 SAK
Molybdenum (Mo) EPA 6010B	Molybdenum	16.4 mg/kg dry		5.00	01/17/24 09:00 SAK	01/18/24 12:44 SAK
Nickel (Ni) EPA 6010B	Nickel	29.6 mg/kg dry		5.00	01/17/24 09:00 SAK	01/18/24 15:49 SAK
Potassium (K) EPA 6010B	Potassium	3200 mg/kg dry		125	01/17/24 09:00 SAK	01/18/24 12:44 SAK
Selenium (Se) EPA 6010B	Selenium	16.5 mg/kg dry		12.5	01/17/24 09:00 SAK	01/18/24 12:44 SAK
Zinc (Zn) EPA 6010B	Zinc	1030 mg/kg dry		12.5	01/17/24 09:00 SAK	01/18/24 12:44 SAK

Sample: ***TO#2*** **Location Code:** **PWSID#:**

Collection Type: Grab Sample Time: 1/9/24 9:30 **Lab Log#** GA09032-02

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Fecal Coliform Sludge SM9222 D	Fecal Coliform	BPQL CFU/g dry		1.0	01/09/24 12:36 @SJF	01/10/24 14:10 @KT

Sample: ***TO#3*** **Location Code:** **PWSID#:**

Collection Type: Grab Sample Time: 1/9/24 9:33 **Lab Log#** GA09032-03

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Fecal Coliform Sludge SM9222 D	Fecal Coliform	881 CFU/g dry		1.0	01/09/24 12:36 @SJF	01/10/24 14:10 @KT

Sample: ***TO#4*** **Location Code:** **PWSID#:**

Collection Type: Grab Sample Time: 1/9/24 9:36 **Lab Log#** GA09032-04

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Fecal Coliform Sludge SM9222 D	Fecal Coliform	BPQL CFU/g dry		1.0	01/09/24 12:45 @SJF	01/10/24 14:10 @KT

Sample: ***TO#5*** **Location Code:** **PWSID#:**

Collection Type: Grab Sample Time: 1/9/24 9:39 **Lab Log#** GA09032-05

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Fecal Coliform Sludge SM9222 D	Fecal Coliform	136 CFU/g dry		1.0	01/09/24 12:45 @SJF	01/10/24 14:10 @KT

Sample: ***TO#6*** **Location Code:** **PWSID#:**

Collection Type: Grab Sample Time: 1/9/24 9:42 **Lab Log#** GA09032-06

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Fecal Coliform Sludge SM9222 D	Fecal Coliform	BPQL CFU/g dry		1.0	01/09/24 13:00 @SJF	01/10/24 14:10 @KT

Sample: ***TO#7*** **Location Code:** **PWSID#:**

Collection Type: Grab Sample Time: 1/9/24 9:45 **Lab Log#** GA09032-07

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Fecal Coliform Sludge SM9222 D	Fecal Coliform	444 CFU/g dry		1.0	01/09/24 13:00 @SJF	01/10/24 14:10 @KT

Sample: ***TO#8*** **Location Code:** **PWSID#:**

Collection Type: Grab Sample Time: 1/9/24 9:48 **Lab Log#** GA09032-08

Method/Parameter	Test	Result	Notes	PQL#	Prep Info	Analysis Info
Fecal Coliform Sludge SM9222 D	Fecal Coliform	68.4 CFU/g dry		1.0	01/09/24 13:10 @SJF	01/10/24 14:10 @KT

Notes and Definitions

#52	Analyte recoveries are outside of acceptance limits for the matrix spike sample This failure does not invalidate data reported
#03	This sample was received outside of EPA recommended holding time.
MCL	Analyte concentration may exceed Maximum Contaminant Limit (MCL) for EPA Primary or Secondary Drinking Water Regulations.
###	Analyte concentration may exceed regulatory limit.
PQL	Practical Quantitation Limit - the method reporting limit (MRL) adjusted for any dilutions or other changes made to the sample to deal with interferences/matrix effects
BPQL	Below Practical Quantitation Limit (if applicable)

The "Prep Date" of the QC analysis coincides with the characters of the appropriate QC Lab ID. (Example: 19 A 02 15 - BLK = 2019, Jan 2, Batch #15 - Blank)

Lab Manager

Quality Control Data

Test results performed meet all method and TNI requirements unless otherwise noted.

Blank Data

QC Lab #	Test Group	Test	Result	PQL	Flags
24A1061-BLK1	Ammonia, Total SM4500NH3 C	Ammonia as N	BPQL mg/kg wet	0.75	
24A0926-BLK1	Fecal Coliform Sludge SM9222 D	Fecal Coliform	BPQL CFU/g dry	1.0	
24A0926-BLK2	Fecal Coliform Sludge SM9222 D	Fecal Coliform	BPQL CFU/g dry	1.0	
24A1732 BLK1	Phosphorus (P), Total - EPA 365.1	Phosphorus	BPQL mg/kg wet	1 25	
24A1057-BLK1	Nitrate EPA 300.0	Nitrate as N	BPQL mg/kg wet	0.500	
24A1281-BLK1	Kjeldahl Nitrogen SM4500Norg C	Total Kjeldahl Nitrogen	BPQL mg/kg wet	2.00	
24A1730-BLK1	Arsenic (As) EPA 6010B	Arsenic	BPQL mg/kg dry	25.0	
24A1730-BLK1	Cadmium (Cd) EPA 6010B	Cadmium	BPQL mg/kg dry	2.50	
24A1730-BLK1	Chromium (Cr) EPA 6010B	Chromium	BPQL mg/kg dry	12.5	
24A1730-BLK1	Copper (Cu) EPA 6010B	Copper	BPQL mg/kg dry	12.5	
24A1730-BLK1	Lead (Pb) EPA 6010B	Lead	BPQL mg/kg dry	25.0	
24A1223-BLK1	Mercury (Hg) EPA 7471A	Mercury	BPQL ug/kg wet	10.0	
24A1730-BLK1	Molybdenum (Mo) EPA 6010B	Molybdenum	BPQL mg/kg dry	5.00	
24A1730-BLK1	Nickel (Ni) EPA 6010B	Nickel	BPQL mg/kg dry	5.00	
24A1730-BLK1	Potassium (K) EPA 6010B	Potassium	BPQL mg/kg dry	125	
24A1730-BLK1	Selenium (Se) EPA 6010B	Selenium	BPQL mg/kg dry	12.5	
24A1730-BLK1	Zinc (Zn) EPA 6010B	Zinc	BPQL mg/kg dry	12.5	

Duplicate Sample Data

QC Lab #	Test Group	Test Name	Source	Dup Result	Samp Result	% RPD	RPD Limit	Flags
24A1538-DUP1	pH in Lab EPA 9045D	pH	GA09032-01	7.34	7.68	5	20	
24A1732-DUP1	Phosphorus (P), Total - EPA 365.1	Phosphorus	GA09032-01	22200	21900	2	20	
24A1538-DUP1	Temperature SM2550 B	Temperature	GA09032 01	20.1	21.1	5	20	
24A1228-DUP1	Total Volatile Solids EPA 160.4	Total Volatile Solids	GA09032-01	68.8	68.9	0.03	10	
24A1227-DUP1	Solids, Percent SM2540 B	Percent Solids	GA09032-01	4.00	4.07	2	10	

Quality Control Data

Test results performed meet all method and TNI requirements unless otherwise noted.

Laboratory Control Sample Data

Lab QC#	Test Group	Test Name	LCS Result	Spike Level	Units	% Rec.	Control Limits	Flags
24A1057-BS1	Nitrate EPA 300.0	Nitrate as N	9.88	10.00	mg/kg wet	99	90 - 110	
24A1061-BS1	Ammonia, Total SM4500NH3 C	Ammonia as N	4.86	5.000	mg/kg wet	97	90 - 110	
24A1061-BS2	Ammonia, Total SM4500NH3 C	Ammonia as N	9.34	10.00	mg/kg wet	93	90 - 110	
24A1281-BS1	Kjeldahl Nitrogen SM4500Norg C	Total Kjeldahl Nitrogen	19.1	20.00	mg/kg wet	96	90 - 110	
24A1281-BS2	Kjeldahl Nitrogen SM4500Norg C	Total Kjeldahl Nitrogen	37.7	40.00	mg/kg wet	94	90 - 110	
24A1538-BS1	pH in Lab EPA 9045D	pH	7.01	7.000	pH Units	100	99 - 101	
24A1732-BS1	Phosphorus (P), Total - EPA 365.1	Phosphorus	22.9	25.00	mg/kg wet	92	90 - 110	
24A1732-BS2	Phosphorus (P), Total - EPA 365.1	Phosphorus	22.6	25.00	mg/kg wet	90	90 - 110	
24A1223-BS1	Mercury (Hg) EPA 7471A	Mercury	352	416.7	ug/kg wet	85	85 - 115	
24A1730-BS1	Arsenic (As) EPA 6010B	Arsenic	464	485.9	mg/kg dry	96	85 - 115	
24A1730-BS1	Cadmium (Cd) EPA 6010B	Cadmium	471	485.9	mg/kg dry	97	85 - 115	
24A1730-BS1	Chromium (Cr) EPA 6010B	Chromium	471	485.9	mg/kg dry	97	85 - 115	
24A1730-BS1	Copper (Cu) EPA 6010B	Copper	466	485.9	mg/kg dry	96	85 - 115	
24A1730-BS1	Lead (Pb) EPA 6010B	Lead	473	485.9	mg/kg dry	97	85 - 115	
24A1730-BS1	Molybdenum (Mo) EPA 6010B	Molybdenum	466	485.9	mg/kg dry	96	85 - 115	
24A1730-BS1	Nickel (Ni) EPA 6010B	Nickel	477	485.9	mg/kg dry	98	85 - 115	
24A1730-BS1	Potassium (K) EPA 6010B	Potassium	461	485.9	mg/kg dry	95	85 - 115	
24A1730-BS1	Selenium (Se) EPA 6010B	Selenium	466	485.9	mg/kg dry	96	85 - 115	
24A1730-BS1	Zinc (Zn) EPA 6010B	Zinc	467	485.9	mg/kg dry	96	85 - 115	

Matrix Spike Data

QC Lab #	Test Group	Test Name	Source Sample	Sample Result	Units	Spike Result	Spike Level	% Rec.	Acceptance Limits	Flags
24A1732-MS1	Phosphorus (P), Total - EPA 365.1	Phosphorus	GA09032-01	21900	mg/kg dry	25900	614.3	660	90 - 110	#52
24A1281-MS1	Kjeldahl Nitrogen SM4500Norg C	Total Kjeldahl Nitrogen	GA09032-01	57900	mg/kg dry	137000	94280	84	80 - 120	

Matrix Spike Duplicate Data

QC Lab #	Test Group	Test Name	Sample Result	Spike Result	Spike Level	Units	% Rec.	Rec. Limits	% RPD	RPD Limit	Flags
24A1281-MSD1	Kjeldahl Nitrogen SM4500Norg C	Total Kjeldahl Nitrogen	57900	135000	92750	ng/kg dr	83	80-120	2	20	

*** Complete Entire COC to be in Compliance***

☐ **RUSH** Due Date _____

Chain of Custody

Accurate Environmental Labs

Client Name- Nutri-Jet Systems Inc

Project Name- Tulsa South Digester

Accurate Work Order #	Date Sample Taken	Time Sample Taken	Matrix or Source (Refer below)	Grab (G) or Comp (C)	Client I.D. / Sample Location or DEQ / EPA Location Code	Field Results (pH, Temp, Chlorine, ...) (note analysis & units) Time	pH	Temp	# of Container ↓	503 Metals, SOUR, TVS, pH, % Solids	NH3, T. Phos, No3, TKN, K	Fecal Coliform
					Sample Preserv. & Container →					1000 mL plastic	1000 mL plastic	125 mL plastic
					Analysis Requested →							
GA09032												
01	1-9-24	9:48	SL	C	TO#1				1	X	X	
02	"	9:30	SL	G	TO #2				1			X
03	"	9:33	SL	G	TO#3				1			X
04	"	9:36	SL	G	TO #4				1			X
05	"	9:39	SL	G	TO #5				1			X
06	"	9:42	SL	G	TO #6				1			X
07	"	9:45	SL	G	TO #7				1			X
08	"	9:48	SL	G	TO #8				1			X

On-Site Info Raw Alkalinity (TOC Raw)= _____ mg/L Turbidity (E.Coli)= _____ ntu

Meter Type	Standards	Final Read.	Initials

Matrix Codes **DW** = Drinking Water **WW** = Wastewater **SL** = Sludge **O** = Other _____

E.Coli Source- **GWUDI-FS**= Groundwater under direct influence of Flowing Stream **GWUDI-RL**= Groundwater under direct influence of Reservoir/Lake

Comments paid w/ card $1615

Certification by Company Official: I hereby certify that the above sampling occurred during a period such that the sample(s) is/are representative of a typical operating day discharge for the above facility. Signature: Date/Time

Sampled By: Company: Sample Method:

Relinquished By:	Date/Time	Received By:		Date/Time
☐ Relinquished to Lab By: ☐ Relq'd to Log-In Fridge By:	Date/Time 1-9-24 10:35 AM	Received at Lab By: Olivia Inman	Rec'd °C: 13.4 (ICE)	Date/Time 1-9-24 1035

Reporting Requirements (standard 10-15 working days)		Compliance Reporting?	Yes or No (DMR, PWS,)	Oklahoma PWS ID #		RUSH Request (if available)	_____ (Working Days)

Mail Report: Ryan Broadhead / Bruce Jensen

Address: 515 5th St Hudson IA

Phone #: 319-242-2548

Email: Ryan@nutriject.com / Bruce@nutriject.com

Mail Invoice: PO Box 398 Nutri-Jet Systems Inc

Address: PO Box 398 Hudson IA 50643

Phone #: 319-988-4705 Fax #: 319-988-3506

Bid # - _____

PO # - _____

www.accuratelabs.com (800) 516-5227

505 South Lowry Street Stillwater, OK 74074 Phone: (405) 372-5300 Fax: (405) 372-5396

3910 East 51st Street Tulsa, OK 74135 Phone: (918) 663-5400 Fax: (918) 663-6300

12036 N. Pennsylvania Oklahoma City, OK 73120 Phone: (405) 751-3132 Fax: (405) 751-3108

Failure to complete this Chain of Custody form correctly may delay turnaround time of analytical reporting.

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

MEMBER ACIL

SUBMITTED BY: 008153	DATE RECEIVED: Feb 5 2024	SUBMITTED FOR:
Nutri-Ject Systems Inc 515 5th St Box 398 Hudson IA 50643	DATE REPORTED: Feb 6 2024 WORK ORDER NO: 202491-00019	TULSA OK

	SAMPLE ID PREV CROP LAB NUMBER	PS 1A 24-M554					SAMPLE ID PREV CROP LAB NUMBER	PS 1B 24-M555				
		V-LOW	LOW	OPT	HIGH	V-HIGH		V-LOW	LOW	OPT	HIGH	V-HIGH
ORGANIC MATTER												
NITROGEN (0-6") / (0-6")	13						7.9					
NO3-N ppm (0-6") / (0-6")	13						7.9					
PHOSPHORUS P Meh 3 ppm	9						3					
POTASSIUM (K) Meh 3 ppm	163.						65.					
ZINC (ppm)												
SULFUR ppm SO4-S												
ACIDITY pH	6.0	B ppm	Fe ppm	Mn ppm	Cu ppm	Na ppm	5.4	B ppm	Fe ppm	Mn ppm	Cu ppm	Na ppm
BUFFER INDEX	6.9						6.8					
CCE %		SALTS mmhos/cm		Cl lbs/A				SALTS mmhos/cm		Cl lbs/A		
		CEC	% BASE SATURATION Ca	Mg	K	Na	H	CEC	% BASE SATURATION Ca	Mg	K	Na	H
CALCIUM ppm												
MAGNESIUM ppm												
		SAND %	SILT %	CLAY %	TEXTURE			SAND %	SILT %	CLAY %	TEXTURE	
ALL GUIDELINES ARE ON A BROADCAST BASIS		CROP FERTILIZER GUIDELINES						CROP FERTILIZER GUIDELINES				
CROP AND YIELD GOAL		CORN/BEANS 180/60 BU						CORN/BEANS 180/60 BU				
NITROGEN (lbs/A)		190						190				
P2O5 (lbs/A) ISU/ISU		164						200				
K2O (lbs/A) ISU/ISU		147						243				
ZINC (lbs/A)												
SULFUR (lbs/A)												
LIME NEEDS AS 100% ENP (lbs/A)		to pH 6.5 No lime required. to pH 6.9 1896 lbs of lime for 6" plow depth.						to pH 6.5 621 lbs of lime for 6" plow depth. to pH 6.9 2722 lbs of lime for 6" plow depth.				

MVTL is a certified laboratory through North American Proficiency and Ag LabCertification Programs following approved NCR-13 Standards. Phosphorus results are determined colorimetrically except where noted.
Soil-test value ranges for phosphorous and potassium are based onCrop Nutrient and Limestone Recommendations in Iowa (PM 1688).
To determine Maximum Return to Nitrogen Rate considering (N price/ lb.)/(corn price): http://cnrc.agron.iastate.edu/

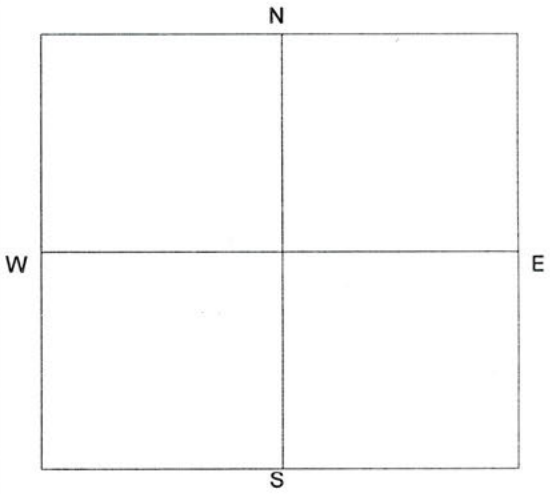
MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

MEMBER ACIL

SUBMITTED BY: 008153	DATE RECEIVED: Feb 5 2024	SUBMITTED FOR:
	DATE REPORTED: Feb 6 2024	
Nutri-Ject Systems Inc	WORK ORDER NO: 202491-00019	
515 5th St		TULSA OK
Box 398		
Hudson IA 50643		

	SAMPLE ID PREV CROP LAB NUMBER	PS 1C 24-M556				
		V-LOW	LOW	OPT	HIGH	V-HIGH
ORGANIC MATTER						
NITROGEN (0-6")	15.3					
NO3-N ppm (0-6")	15.3					
PHOSPHORUS P Meh 3 ppm	6					
POTASSIUM (K) Meh 3 ppm	85.					
ZINC (ppm)						
SULFUR ppm SO4-S						
ACIDITY pH	5.7	B ppm	Fe ppm	Mn ppm	Cu ppm	Na ppm
BUFFER INDEX	6.9					
CCE %		SALTS mmhos/cm		Cl lbs/A		
		CEC	% BASE SATURATION			
CALCIUM ppm			Ca	Mg	K	Na H
MAGNESIUM ppm						
		SAND %	SILT %	CLAY %		
		TEXTURE				



Additional Notes:

ALL GUIDELINES ARE ON A BROADCAST BASIS	CROP FERTILIZER GUIDELINES		
CROP AND YIELD GOAL	CORN/BEANS 180/60 BU		
NITROGEN (lbs/A)	190		
P2O5 (lbs/A) ISU	182		
K2O (lbs/A) ISU	231		
ZINC (lbs/A)			
SULFUR (lbs/A)			
LIME NEEDS AS	to pH 6.5 No lime required.		
100% ENP (lbs/A)	to pH 6.9 1896 lbs of lime for 6" plow depth.		

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SOIL SAMPLE INFORMATION SHEET

Oklahoma Sample

MVTL LABORATORIES, Inc.

35 W. Lincoln Way
Nevada, IA 50201
mvtl@nevia.net
(515) 382-3084
1-800-362-0855
Fax (515) 382-5644

Submitted By: Scott Wiesands	Grower Name:
NUTRI-JECT SYSTEMS, INC.	
515 5th St. Box 398	Tulsa ok.
Hudson, IA 50643	Account #:

County:	Creek, OK
Twp:	18 N R-11 E
Section:	7
Acres:	90
Sampler:	Ryan Broadhead
Date Sampled:	1-22-24

LABORATORY USE ONLY	Field and/or Sample No.	Analyses Requested											Crop Recommendations	
		Basic PH, BpH, P, K	OM	Base Saturation/CEC Ca, Mg	Zn	S	B	Full Micro Na S Zn Cu Mn Fe B	Salinity	NO3-N	Soybean Cyst Nematode	Texture by Hydrometer	Crop	Yield Goal
	PS 1A	✓ plus nitrate												
	PS 1B	✓ plus nitrate												
	PS 1C	✓ plus nitrate												

28-February-2024

Mr. Ryan Broadhead
Nutri-ject

Re: Letter of Intent – TUMA Project WPC 23-4, FY ’23 Southslope Capital Equipment Replacements

Dear Mr. Broadhead:

Nutri-ject is ordered to proceed with the digester cleanout work on Project WPC 23-4 as of the date of this letter. The City of Tulsa has authorized Nutri-Ject Systems to be used as their custom applicator for this process. This is a one-time application, not an ongoing project.

Sincerely,

Masaru Brook Iwata

(on behalf of)

Cindy Cantero.
Water Pollution Control Manager
City of Tulsa Water and Sewer Department