BIOSOLIDS MANAGEMENT PLAN
FOR
CITY OF YANKTON, SOUTH DAKOTA
WASTEWATER TREATMENT FACILITIES
PERMIT # SDLG23396
EFFECTIVE SEPTEMBER 1st, 2023 TO AUGUST 31st, 2028

A. A description of the permittee's biosolids production and any current and known future land application sites. This includes a legal description of all fields to be used for land application, the crop to be planted on each field, the number of acres in each field, whether the land is leased or owned by the city and whether the field is irrigated. Land identified or classified as wetlands, lakes, rivers, or streams, farmsteads, tree belts, or other buffer zones that cannot or will not be used for biosolids application shall not be included in the total number of acres available.

Biosolids are generated from a primary two-stage anaerobic digestion process and one secondary waste activated sludge, single stage anaerobic digester. Digested sludge is drawn from the digesters and stored in two storage/dewatering lagoons. The supernate from the lagoons is transferred to a water lagoon. The nitrified lagoon water is pumped to the plant influent for final treatment. Once per year (fall), the thickened sludge is mixed and hauled to the sludge application sites and surface applied and covered, or injected, by a private contractor. Land used for biosolids application is privately owned and not leased by the City of Yankton. Corn is the crop that is grown on the sludge amended land the following year after application.

The Wastewater Treatment Facility's annual sludge application data can be found in our NetDMR annual biosolids reports. See the following table for a summary:

ANNUAL SLUDGE APPLICATION, Dry Tonnes

YEAR	2018	2019	2020	2021	2022
DRY TONNES	346.6	280.2	311.7	332.4	351.53

Currently, 1876.5 landowner acres are available for the biosolids application, 1364.2 of those acres are irrigated.
The application sites range in size from 38 to 272 acres. The City of Yankton secures an annual contract with the sludge hauler/landowner to apply biosolids.

CURRENT LAND APPLICATIONS SITES, LEGAL DESCRIPTIONS AND GPS COORDINATES

Site	Hectares	Acres	Location
Steve Schmidt			
Tract 1587	60.2	148.1	Section 94N 54W 28
Field 2			Latitude 42.936202
Irrigated acres			Longitude -97.232746
Tract 1497	63.2	155	Section 94N 54W 28
Field 2			Latitude 42.92845
Irrigated acres			Longitude -97.23463
Willard Schmidt			
Tract 187	62.2	153	Section 93N 54W 9
Field 1-4			Latitude 42.890203
			Longitude -97.238461
Irrigated acres			
Duane Potts			
Tract 971	26.8	65.7	Section 93N 55W 15
Field 1			Latitude 42.878968
Irrigated acres			Longitude -97.321983
Tract 2094	50.3	123.4	Section 93N 55W 15
			Section 93 N 55W 14
			Latitude 42.875693
Irrigated acres			Longitude -97.3200921
Tom Coulson			
Tract 2079, Field 1	21.6	53	Sec 93N 55W 11
Tract 2095, Field 1			Latitude 42.882418
Irrigated Acres			Longitude -97.312505

Site	Hectares	Acres	Location
Tom Coulson			
Tract #2094	15.8	38.9	Section 93N55W11.
Field 12			
Tract #2079			Latitude 42.878436
Field 2			
Non-Irrigated Acres			Longitude 97.310390
Bye Brothers Farms Rex, Rick & Jim Bye			
Tract #5846	65	160	Section 16-93N-54W
Fields 1-5			Latitude 42.8786
Irrigated Acres			Longitude 97.2275
Tract #7055	65	160	Section 16-93N54W
Fields 1-6			Latitude 42.8679
Irrigated Acres			Longitude 97.2262
Ron Heine Family Farms			
Farm #6939	72.5	178.4	Sec 2-93N-55W
Tract #255			Latitude 42.8943
Irrigated Acres			Longitude -97.3134
Farm #7128	62.2	153	Sec 5, T93N, R55W
Tract 254			Latitude 42.90196
Non-Irrigated Acres			Longitude 97.37292
Anschell Properties			
Farm #6560	41.9	104 East	5 - 93N - 55W
Tract #7378	15.4	38 West	8 - 93N - 55W
Non-Irrigated			Latitude 42.89265 Longitude -97.36983
Eagle Ventures			
Farm #7113	39.0	96	2 -93N - 55W
Tract #6465			11 -93N -55W
Tract #2092	101.6	250	15 -93N -55W
Irrigated			Latitude 42.87578
			Longitude -97.33371

B. A detailed map showing the outline of each field and all buffers zones and separation distances shall be included. Buffer zones to be identified and included are between biosolids application sites and: surface waters, drinking water wells, drainage ditches, property lines, residences, schools, playgrounds, airports, public roadways, and any necessary site-specific buffer zones for current sites; and source of operating procedures (e.g., qualified soils consultant, Soil Conservation Service, State Extension Service) for making annual adjustments and for setting buffer zones for future sites.

See Attachment A: Land Application Site Maps and Buffer Zones. The buffer zones are highlighted in red. Suggested buffer zones are listed in the EPA Region VIII 1999 Biosolids Management Handbook, and were modified to apply to our application sites

Buffer zones being followed by the City of Yankton relating to:

Erosion Control Grass-ways or drainage ditches: No sludge shall be applied on established grassed erosion control grass-ways or drainage ditches. A 50 foot buffer zone will exist around the grass-ways. A drainage ditch is considered a waterway and Waters of the State, consequently a 100 foot buffer zone setback will be required.

Property Lines: No sludge shall be applied within 50 feet of any property line and established road Right of Way.

Residences: No sludge shall be applied within 50 feet of any property line surrounding a residence or within 50 feet of such residence, whichever distance is the most restrictive.

C. Soils map for the land application fields and a description of predominate soil types for each field.

See Attachment B.: Soils Maps for the Land Application Fields.

D. Site management practices relating to, at a minimum: floodplain, slope, depth to ground water, weather conditions, soil conditions, (compaction, permeability, saturated, frozen, snow covered), site access, protection of surface waters, wetlands, endangered species, and wells at current sites.

Flood Plain: Flood plains exist at two current sludge application sites.

Slope: No sludge shall be applied to slopes greater than 12%.

Depth to Groundwater: Sludge shall not be placed where there is potential contact with ground waters. The Secretary will determine on a case-by-case basis if the land application sites are located over a shallow aquifer.

Weather Conditions: To protect surface waters and groundwater; sludge shall not be applied to saturated ground and/or when storm events exceed 1/4 inch per hour.

Soil Conditions: No sludge shall be applied to frozen, ice covered or snow covered sites where the slope of the site exceeds six percent.

Biosolids shall not be applied to frozen, ice covered, or snow covered sites if the slope of the land is between 3 and 6 percent, unless the following requirement is met.

a) There is 80 percent vegetative ground cover.
b) SDDANR has approved a plan demonstrating adequate runoff containment measures.

Biosolids shall not be applied to sites where the available phosphorous content of the soil exceeds the following levels:

a) For soil pH greater than 6.5 s.u.
    1. 100 ppm based on bicarbonate extraction method (Olsen): or
    2. 50 ppm based on AB-DPTA extraction analytical method;
b) For soil pH 6.5 s.u. or less:
    1. 170 ppm based on the Bray and Kurtz P1 extraction method.

Site Access: Public access to land with a low potential for public exposure shall be restricted for 30 days after application of sewage sludge. Animals shall not be allowed to graze on the land within 30 days after application. Signage will be posted for 30 days showing the site restriction criteria.

Surface Waters and Wetlands: No sludge shall be applied to any site area with standing surface water. A 100 foot buffer zone shall be maintained between the sludge application area and the water bodies. There shall be no runoff of biosolids from land applications sites.

Endangered Species: Current sludge application sites are on established agricultural ground. This is a reissuance of an existing permit. No listed endangered species are expected to be impacted by activities related to biosolids applications.

Underground Drinking Water Sources: No sludge shall be applied at locations within 300 feet of any drinking water well. Presently, no drinking water wells exist on the sludge application sites.

E. A list of counties (and states if applicable) where the permittee may want to market or distribute its biosolids over the life of the permit (5 years minimum). A copy of the Plan must be submitted to the appropriate State Health Department, and should be submitted to the State Extension Service Office in the counties where biosolids may be marketed.

The City of Yankton Wastewater Treatment Facility will distribute its sludge in Yankton County, South Dakota.

F. Site selection criteria to be used when identifying new land application sites.

1. Review the physical characteristics of potential application areas for suitable topography, soil characteristics (permeability, infiltration and drainage), depths to groundwater, and distances to surface waters and perform soil testing requirements (phosphorus and nitrogen content).

2. Review the potential sites for location (public acceptance and aesthetics), any applicable zoning ordinances, current and future land uses, site acquisition, travel distances, access available and relative costs for the sludge transport vehicles and the sludge application unit, acceptable cropping, farming and fertilizing practices.

3. Present the proposed application site to the South Dakota DANR for review by the South Dakota Geological Survey.

G. Storage provision or alternate disposal for biosolids during periods when biosolids cannot be land applied.

Three lagoons (one million gallon capacity, each) are available for sludge storage. Currently, two of the lagoons are used for sludge storage and one lagoon is used to store water from dewatering operations. If an event occurs that limits biosolids application in October, the dewatering lagoon would be available for additional sludge storage. Biosolids application would then occur in the spring prior to the planting season.

H. Contingency plans that describes disposal options for any biosolids that do not meet the requirements for land application or exceed storage capacity.

Clay County Landfill Site is a State permitted land fill site operated by a joint powers agreement between Yankton and Vermillion. The landfill is located 3.5 miles northwest of Vermillion in Clay County, South Dakota. The City of Yankton will comply with any disposal requirements in Section 5 Outfall 203 of the General Permit.

I. Alternative Pollutant limits or maximum acceptable annual and total cumulative application rates, expressed as kilograms per hectare (kg/ha), for arsenic, cadmium, copper, lead, mercury, nickel, selenium, and zinc: any other pollutants regulated by the 40 CFR Part 503 rules.

40 CFR 503.16 specifies the frequency of monitoring per 365 day period based off amount of biosolids land applied for metals. The Wastewater Laboratory will assume an amount of equal or greater than 290 but less than 1,500 DMT, and will collect a sludge sample quarterly for analysis of the chemical pollutant composition in the biosolids. The sample will be taken from the Primary and Secondary digester pumping to the sludge lagoons during the first and second quarter testing. The 3rd and 4th quarter sampling will take place directly out of the sludge storage lagoons. All samples will be collected, preserved and shipped to Midwest Labs for testing.

J. Maximum acceptable sludge application rate to assure that the amount of sludge applied does not exceed the nutrient requirements of the particular crop grown on the application site (agronomic rates) for current year crops, and operating procedures (e.g., qualified soils consultant, Soil Conservation Service, State Extension Service) for making annual agronomic rate adjustments and for setting agronomic rates for future sites.

The agronomic rate for nitrogen is calculated from the expected crop yield nitrogen requirements; (1.2 lbs. of PAN per bushel of corn, 5.5 lbs. of PAN per bushel of soybeans, 2.5 lbs. of PAN per bushel of wheat, and 1.3 lbs. of PAN per bushel of oats), and the PAN nitrogen content of the biosolids, minus the background soil nitrate levels (0 to 2 ft.). The City of Yankton monitors the historical crop yields, conducts deep soil monitoring of nitrate nitrogen (to the 5 ft. level) and will discuss these facts with the landowner to adjust the expected yield goals as required to prevent a build up of nitrate nitrogen in the soil. Midwest Laboratories in Omaha, Nebraska conducts the laboratory analysis of soil and biosolids samples, and has an in house soil agronomist to provide consulting services. Also, please see **Attachment C**., Agronomic Rate Calculations.

K. A description of the pathogen treatment, vector attraction, control, record keeping, monitoring, certifications, and notifications as required by the permit.

RECORDS OF PATHOGEN REDUCTION

The 40 CFR 503.17 regulations require the maintenance of records that include a description of how compliance was achieved and a certification that the pathogen requirements were met. In general, the description should explain the treatment process for pathogen reduction and log books documenting operational parameters and evaluations for sludge treatments units.

503.17(a)(5)(c) A description of how the pathogen requirements in either 503.32(a) or (b) are met:

The Process to Significantly Reduce Pathogens of Sewage Sludge at Yankton POTW is Anaerobic Digestion, 40 CFR 503.32(b) (3). Primary sludge is fed to a 2-stage heated digestion process and secondary waste activated sludge is fed to a heated single stage digester. Digested sludge is pumped to three storage lagoons and dewatered prior to land disposal. The anaerobic digestion process is supported by the following documentation:
- Calculation of Mean Residence Time of sludge in digesters (between 15 days at 35 to 55 degrees Celsius and 60 days at 20 degrees Celsius).
- Temperature logs of sludge in digesters (recorded twice per 8 hour shift).
- The process control data is recorded on, calculated and evaluated from the Wastewater Treatment Daily Log Sheet and the Monthly Digester Control Log Sheet.

-If the Mean Residence Time of sludge is not met then the Microbiological limit will be tested.
-Collection and analysis of Fecal Coliform samples from the sludge storage lagoons taken quarterly. Fecal Coliforms shall be < 2,000,000 MPN or CFU per gram of Total Solids (based on the Geometric Mean of 28 grab samples of sludge taken quarterly throughout the year). The samples will be: 7 grab samples taken during primary and secondary digester pump out to the lagoon system for the first two quarters. The 3rd & 4th quarter sample will be taken directly from the lagoons. The first 3 quarters will be tested prior to land application by South Dakota health lab (SDDOH). The 4th quarter sample will be taken after mixing, during sludge application taken as 7 grab samples during tanker loading and will be tested by SDDOH.

RECORDS OF VECTOR ATTRACTION REDUCTION

When sewage sludge is land applied, the Part 503 regulations requires a certification statement that the vector attraction reduction requirements where met and a description of how these requirements were achieved. The description should be supported by documentation of process controls and management practices for treatment processes that achieve vector attraction reduction.

503.15 C. Vector Attraction Reduction - Sewage Sludge. (1) One of the Vector Attraction Reduction methods in 503.33(b)(1) through (b)(10) shall be met when bulk sewage sludge is applied to agricultural land, forest, a public contract site, or a reclamation site.

The City of Yankton meets the Vector Attraction Reduction requirements of 503.33(b)(1) The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent. The monitoring frequency shall follow Table 1 of 503.16 - FREQUENCY OF MONITORING - LAND APPLICATION.

503.17(a)(5)(M) If the vector attraction reduction requirements in either 503.33(b)(9) or (b)(10) are met, a description of how the requirements are met:

The City of Yankton meets the sludge management option requirement of 503.33(b)(10)(i) Sewage Sludge applied to the land surface or placed on a surface disposal site shall be incorporated into the soil within 6 hours after application or placement on the land.

SITE RESTRICTIONS

503.17(a)(5)(k) A description of how the site restrictions in 503.32(b)(5) are met for each site on which Class B bulk sewage sludge is applied.

The Sludge Management Agreement references Site Restrictions 40 CFR 503.32(5)(i) Food crops with harvested parts that touch the sludge/soil mixture and are totally above the land surface shall not be harvested for 14 months after application.(ii) Food crops

with harvested parts for 20 months after application if the sludge remains on the land surface for four months or more prior to application in the soil.(iii) Food crops with harvested parts below the land surface shall not be harvested for 38 months after application if the sludge remains on the land surface for less than four months prior to incorporation into the soil.(iv) Food crops, feed crops and fiber crops shall not be harvested for 30 days after application of sewage sludge.(v) Animals shall not be allowed to graze on the land for 30 days after application of sewage sludge.(vi) Turf grown on land where sludge is applied shall not be harvested for one year after application if the harvested turf is placed on either land with a high potential for public exposure or a lawn.(vii) Public access to land with a high potential for public exposure shall be restricted for one year after application.(viii) Public access to land with a low potential for public exposure shall be restricted for 30 days after application. Site restrictions (iv), (v) and (viii) are applicable restrictions for the current land-owner cropping practices and sub-soil application practice currently used by the City of Yankton.

RECORDKEEPING

40 CFR 503.17 (5) requires the City of Yankton to maintain records documenting the concentration of the pollutants in the sludge. The sludge cannot exceed the Daily Maximum concentrations in Table 1 of 503.13 or the Monthly Averages in Table 3 of 503.13. With respect to pathogens and vector attraction; the records must describe how the pathogen and vector attraction requirements were met and include a signed certification of their achievement.

For each land application site where biosolids are land applied during the reporting year the following information shall be maintained:

1. Site name;
2. Site owner and/or operator;
3. Person or entity that applies biosolids to the land;
4. Latitude and longitude of site;
5. Street address of Section, Township, and Range;
6. Size (hectares);
7. Crop to be grown or harvested on application site;
8. Application rate (metric tons/hectare); and
9. Cumulative pollutant loading rate (Kg/Ha), if applicable.
10. Cumulative pollutant rate certification statement, if applicable.

Application Site Inspection information shall include:

1. Name of inspector;
2. Date and time of biosolids application;
3. Weather conditions at time of application and for 24 hours prior to and following application;
4. The method used to apply the biosolids;
5. Observations made; and

6. The date and nature of any corrective actions required or taken.

Record of monitoring information shall include:

1. The date, exact place, and time of sampling of measurements;
2. The initials of names of the individuals who performed the sampling or measurements;
3. The date analyses were performed;
4. The time analyses were initiated;
5. The initials or names of individuals who performed the analyses;

CERTIFICATION STATEMENTS FOR PATHOGEN REDUCTION, VECTOR ATTRACTION REQUIREMENTS, BEST MANAGEMENT PRACTICES, SITE RESTRICTIONS FOLLOWED, SIGNATURE, TITLE AND DATE OF CERTIFYING OFFICIAL

"I certify, under penalty of law, that the pathogen requirements in Part 3.0 (3.2) of the permit, one of vector attraction reduction alternatives in Part 3.0 (3.3) of the permit, the best management practices in Part 3.0 (3.6) of the permit, and the site restrictions in Part 3.0 (3.4) of the permit have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements, the vector attraction reduction, the management practices and the site restrictions have been met. I am aware that there are significant penalties for false certification including the possibility imprisonment."

Signature, Title and Date of certifying official:

NOTIFICATION AND REPORTING

Change in Treatment System of Use/Disposal:

The Permittee must inform the SDDANR at least 180 days prior of any significant change in the biosolids generation and handling processes at the plant and any major change in use/disposal practices. This includes, but is not limited to, the addition or removal of biosolids treatment units (e.g., digesters, drying beds, etc.) and/or any other change which would require a major modification of the permit (e.g., changing from land application to surface disposal).

Proposed new land application sites:

Public notice requesting public comment will be published once in the local newspaper for proposed new land application sites. The City of Yankton will notify the State of South Dakota at least 30 days of any new proposed land application sites.

Specified Cover Crop:

The specified cover crop shall be planted during the next available planting season. If this does not occur, the City of Yankton shall notify the SDDANR in writing.

Notice and Necessary Information:

When sewage sludge is prepared for land application the City of Yankton must provide the following sludge quality information and site use restrictions to the landowner and/or the lease holder:

- Location of land application site.
- Date bulk sludge was applied.
- Time bulk sludge was applied
- Number of hectares where sludge was applied.
- Amount of sludge applied (gallons).
- Cumulative amount of each pollutant applied (metals and nitrogen, kg/ha).
- Pathogen reduction level achieved.
- Vector attraction reduction used.
- Applicable site restriction requirements.

The South Dakota Department of Agriculture regulates the disposal of Bio-solids at a reduced level by having the product properly labeled to the end user as required by 38-19-15 and 38-19-16.

The requirements include:

- The source from which the nitrogen, phosphorus, and potassium are derived.
- The name and address of the distributor.
- The net weight of the biosolids applied.
- The guaranteed analysis of Total Nitrogen (N), Available Phosphoric Acid (P205) and Soluble Potash (K20) reported in percent.

Annual Reports:

The City of Yankton shall develop an annual biosolids report in accordance with 40 CFR 503.18 (a.b.r. in ARSD Chapter 74:52:09). This report shall include the results of all monitoring performed in accordance with the self - monitoring requirements of the permit, information on best management practices, land application sites, site restrictions, and certifications. The report shall be submitted to SDDANR no later than February 19th of each year. Each report is for the previous calendar year.

Reports shall be electronically submitted to the South Dakota Department of Environment and Natural Resources. The Data will also be submitted on the EPA NetDMR reporting program.

L. Procedures the permittee intends to use to ensure that biosolids practices and limits outlined in the permit are followed.

The City of Yankton ensures compliance of the practices and limits outlined in the biosolids permit.

M. Public notice procedures and procedures for advance (at least 30 days) notice to SDDANR of proposed new land application sites.

Public notice requesting public comment will be published once in the local newspaper for proposed new land application sites. The City of Yankton will notify the State of South Dakota at least 30 days of any new proposed land application sites.

N. Procedures or copies of documents specifying procedures (e.g., contracts) that will be used to ensure compliance with this permit and applicable regulations if the permittee contracts with others for assistance to select and/or manage the land applications sites.

See **Attachment D.** Specifications and Bid form for Water and Wastewater Treatment Plant Sludge Removal

O. A statement (e.g., city ordinance) that the permittee will comply with the Biosolids Management Plan, as approved by SDDANR.

The City of Yankton, South Dakota will comply with the Biosolids Management Plan as approved by SDDANR.

P. A statement that the Plan will be amended to reflect any applicable practices or limits EPA or SDDANR requires.

The approved Biosolids Management Plan will be amended by the City of Yankton, South Dakota as necessary to reflect any applicable practices or limits EPA or SDDANR requires.

Q. A description of the sample collection, preservation and analysis methods used for sampling and monitoring of parameters.

This facility collects samples quarterly to monitor the Fecal Coliform and Chemical Pollutants, with sampling occurring from long term anaerobic digested sludge storage and dewatering lagoons. The facility has three lagoons available for sludge storage and dewatering. Two lagoons are used to contain the digested sludge and one lagoon is used for dewatering storage. Once/yr. (fall), the sludge lagoons are emptied and the biosolids are surface applied and incorporated. 1388 irrigated agricultural acres are available for biosolids disposal.

BIOSOLIDS SAMPLING PLAN FOR LAND APPLICTION

Biosolids sampling occurs in the fall prior to land application. A composite sample is collected from the two dewatered unmixed sludge storage lagoons. A coliwasa sampling device is used to collect a core sample of sludge. Ten to fifteen random grab samples are collected from each lagoon and analyzed separately. The analytical results from these samples are used to initially estimate the agronomic loading rates for nitrogen and compliance with 503.13 Tables 1 & 3 Chemical Pollutant Limitation Requirements. The second sampling event occurs as the sludge is land applied. The lagoons are mixed and representative grab samples are collected from the load conveyor every 3 to 5 loads that are filled at the lagoon site (frequency depends on the size of the field and the volume of sludge needed to composite a sample). The date, time of collection and samplers name are recorded on the load sheet for each application site. Biosolids samples collected in the field are preserved by cooling to 4 degrees Celsius in an ice water bath contained in an ice chest. The samples are transferred at the end of each 8 hour shift to the wastewater laboratory and stored in the laboratory refrigerator. Temperatures are recorded in the field on the load sheet and in the laboratory on the Daily QA Log Sheet. Sludge samples are composited in the wastewater laboratory, placed in the appropriate containers and shipped with a chain of custody to the contract laboratory via UPS overnight air delivery. The contract laboratory follows 40 CFR 503.8(b) Methods for analysis of Biosolids samples. The analytical results from the second sampling event is applied to 503.13 Tables 1 & 3 for verification of Chemical Pollutant Limitations and calculation of the applied agronomic rate for nitrogen.

SOIL SAMPLING PLAN

Annual soil monitoring of the land application sites is required of this facility. Specific for each landowner and site, a minimum of six samples from each available site will be collected once every year. A soil map is obtained and each soil type is sampled at least once within the application site. A Bobcat Skid-steer loader with an auger is used to bore to the 5 foot level. Shallow Nitrate as N will be sampled at the 0 – 1 foot and 1 – 2 foot depth. Deep Nitrate as N will be sampled at the 2 – 5 foot depth, in 1 foot increments. Phosphorus as P will be sampled at the 0 – 6 inch depth. Each increment will be composited with the other samples from the land application site and one analysis for Nitrate as N will be performed for each increment and one analysis for Phosphorus as P will be performed on the 0 – 6 inch increment. The pH will be determined from the composite 0 – 6 inch increment.

PATHOGEN REDUCTION REQUIREMENT SAMPLING AND ANALYSIS PLAN

The Process to Significantly Reduce Pathogens for this facility is Anaerobic Digestion, 503.32(b)(3). The process is supported by the following sampling and analysis plan:

(1). Record of sludge (gallons per day) fed to the primary and secondary sludge digesters for calculation of Mean Residence Time.

(2). Record of Anaerobic Digester temperature results taken twice per day, in the AM and PM operations daily checks.

(3). Collection of Fecal Coliform samples from the Anaerobic Digester pump out to the lagoons quarterly. Samples will be taken directly from the pump out flow to the lagoon system in the 1st and 2nd quarter. The third quarter sample will be taken directly from the dewatered lagoons. The samples will be taken from the mixer pump flow while filling the tankers during biosolids application in the 4th quarter. 28 grab samples are collected during the annual biosolids sampling. Based on the geometric mean of the 28 samples, the Fecal Coliforms shall be less than 2,000,000 MPN or CFU/gram of total solids.

The process control data is recorded, calculated and evaluated from the Wastewater Treatment Daily Log Sheet and the Monthly Digester Control Log Spreadsheet.

VECTOR ATTRACTION REDUCTION SAMPLING AND ANALYSIS PLAN

The Vector Attraction Reduction process for this facility meets the requirements of 503.33(b)(1) The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38 percent. The sampling and analysis plan includes; the weekly grab samples of both primary sludge and secondary waste activated sludge fed to the digesters and grab samples of digested sludge pumped to the storage lagoons. The process control data is recorded, calculated and evaluated on the Wastewater Treatment Daily Log Sheet and the Monthly Digester Control Log spreadsheet. Volatile Solids Reduction is calculated using the Van Kleeck formula. The Vector Attraction Reduction requirement is also met by the incorporation of biosolids into the soil within six hours of application.

Pollutant Limits

This facility collects samples quarterly to monitor the Chemical Pollutants, with sampling occurring from anaerobic digested sludge and long term storage and dewatering lagoons. The 1st and 2nd quarter sampling takes place at the lagoon influent line during the digester pumping from the second stage primary anaerobic digester and the secondary anaerobic digester to the lagoon system. These samples will be taken via grab during the 5 hour pump out period. The 3rd quarter sampling will occur from a boat in order to sample directly from the lagoons, and comprise of a composite sample taken from the A and C sludge lagoons using a Coliwasa sampling tube. The 4th quarter sample will be taken from the lagoon mixer pump during the loading of the tankers during the biosolids application process. These will be grab samples through the 8hr day and will be

composited for a representative sample. The samples from each quarter will be sent to Midwest Labs for 503 regulation testing. The results will be recorded and reported on our annual biosolids report.

PRESERVATION TECHNIQUES

Sludge and Soil samples collected will be cooled to 4 degrees Celsius at the site of collection and then transported to the Wastewater Laboratory for storage and/or compositing. Composited samples are iced and shipped overnight to a selected laboratory for analysis. Documentation of application sites, collection times, sample I.D #, collection containers, sampling volume, samplers and storage temperatures are recorded on the Field Chain of Custody.

ANALYSIS METHODS

Sample Type	Parameter	Method Reference
Soil	Nitrate, Nitrogen	NCR, pg. 11
	Phosphorus as P, pH > 6.5	NCR, p. 14-15
	Phosphorus as P, pH < 6.5	NCR, p. 14-15
	Bicarbonate P	ASA, p. 421-422
	pH	NCR. P. 5-8
Sludge	Nitrate, Nitrogen	EPA 353.2
	Total Kjeldahl Nitrogen	PA1-DK 01
	Ammonical Nitrogen	SM 4500-NH3-C 1997
	Organic-N	Calculated
	Total Phosphorus as P	EPA 6010 B
	Total Potassium as K	EPA 6010 B
	Metals	EPA 6010/6020 prepared by EPA 3050
	Mercury	EPA 7471
	Total Solids	SM 2540 G
	Total Volatile Solids	SM 2540 G
	pH	EPA 9045
	Fecal Coliform	SM 9221 C

R. Other nutrient applications to the fields e.g. manure, commercial fertilizer.

The City of Yankton estimates application rates at 90% of the agronomic rates based on the results of lagoon core samples. The actual application rate is calculated from the composite samples taken during biosolids application. Landowners who irrigate have developed individual nutrient management practices. One of the practices is to review the applied biosolids nitrogen and tissue samples of the corn crop during the growth stages. If needed, the landowner may broadcast additional nutrients to reach their yield goals.

The City of Yankton estimates a maximum corn yield for irrigated acres at 250 bu/acre. The City of Yankton believes the addition of nitrogen at 90% of the agronomic rate is an acceptable management practice. To avoid the build-up of nitrate nitrogen, the City of Yankton uses the management practice of deep soil sampling for nitrate nitrogen.

ATTACHMENT A

LAND APPLICATION SITE MAPS AND BUFFER ZONES

ATTACHMENT B

SOILS MAPS FOR THE LAND APPLICATION FIELDS

ATTACHMENT C

AGRONOMIC RATE CALCULATIONS

ATTACHMENT D

SPECIFICATIONS AND BID FORM FOR
WATER TREATMENT PLANT AND WASTEWATER TREATMENT PLANT
SLUDGE REMOVAL

ATTACHMENT E
REMOVED BIOSOLIDS APPLICATION SITES