United States Environmental Protection Agency

Biosolids Facility Inspection

GENERAL INFORMATION

Date_____ Time In_____Time Out_____

Facility Name_____

Mailing Address_____

_____

E-mail _____

Contact/Title_____

Phone_____

Discharge Permit # _____

EPA Region 8 Biosolids Permit # _____

Inspector_____

Reason for Inspection: ☐ Routine ☐ Complaint

Type of Facility
- ☐ Approved Pretreatment Program
- ☐ POTW Flow ≥ 1 MGD
- ☐ Domestic Wastewater Treatment Works ≥ 2000 GPD
- ☐ Other
- ☐ Reuse Effluent (other than at facility)

Method of Solids Disposal
- ☐ Land Application (beneficial use)
  - ☐ Bulk Ag Land _____%
  - ☐ Compost _____%
  - ☐ Other _____ _____%
- ☐ Surface Disposal _____
- ☐ Landfill _____
- ☐ Transferred to Another Facility
  Facility_____
- ☐ Other_____

PERMIT VERIFICATION

Y N N/A 1. Are 40 CFR Part 503 sludge use and disposal requirements contained in:
- ☐ NPDES Permit?
- ☐ NPDES Sludge Only Permit?
- ☐ EPA REGION 8 General Permit?
- ☐ EPA Region 8 Individual Permit?
- ☐ RCRA Subtitle C permit? Effective date(s) of applicable permit_____

2 Annual Sludge Production_____(mt/yr, T/yr) [last calendar year]

Y N N/A 3. Are number and location of disposal sites/activities described in permit or approved management plan?

RECORDKEEPING AND REPORTING EVALUATION

Y N N/A 4. Are records available for all use or disposal practices? _____

Y N N/A 5. Are the number and location of sludge disposal sites available? (i.e., location maps) _____

Y N N/A 6. Are self-monitoring data available for all regulated pollutants? _____

Y N N/A 7. Are Pathogen and Vector Attraction Reduction method descriptions and certification statements available?

Y N N/A 8. Are accurate records of sludge volume or mass maintained, where appropriate? _____

Y N N/A 9. Are self-monitoring activities conducted at required frequencies? (See Figure-1 on next page)

The facility should be contacted at least 48 hours prior to arriving for inspection - Allow 1 – 1.5 hours for inspection

The following records will need to be provided by the facility/contractor at the time of inspection:

- Discharge Permit Number
- EPA General Permit Number
- Records for All Disposal Practices
- Biosolids Annual Reports and Certification Statements for Past 5 years
  - Biosolids Quantities
  - Pathogen Destruction Criteria
  - Metals Criteria for Past Five Years
  - Vector Attraction Reduction for Past Five Years
  - Site Data
- Sampling and Analysis Plan
  - QA/QC
  - Sampling Records
  - Preservation Records
  - Shipping Records
  - Chain of Custody Records
  - Analysis Results Records

Return completed inspection form to:

Biosolids Management Program
(WQCD-P-B2) 4300 Cherry Creek Drive South
Denver, CO 80246-1530
or
Fax to: 303-782-0390

FIGURE – 1 FREQUENCY OF BIOSOLIDS SAMPLE COLLECTION AND ANALYSIS

ANNUAL BIOSOLIDS PRODUCTION Dry short tons/year	FREQUENCY
Less than 319	Once per year
319 to less than 1,650	Once per quarter (four per year)
1,650 to less than 16,500	Once per two months (six per year)
16,500 and greater	Monthly (twelve per year)

RECORDKEEPING AND REPORTING EVALUATION CONTINUED

Y N N/A 10. Are sludge records maintained for at least 5 years?

- ☐ Maintained by facility ☐ Maintained by Contractor ☐ Other _____
- ☐ Concentration of each pollutant _____
- ☐ Certification for both Pathogen and Vector Attraction Reduction _____
- ☐ Description of how Class A/B requirements are met _____
- ☐ Description of how Vector Attraction Reduction requirements are met _____
- ☐ Description of site restrictions (if applicable) _____
- ☐ Site locations, area, date, time and amount of sludge applied (if applicable) _____

11. Are sludge data reported to the appropriate regulatory authority? If so, how often?_____

SLUDGE SAMPLING AND ANALYSIS EVALUATION

Y N N/A 12. Are sludge sampling locations appropriate for obtaining a representative sample? _____

Y N N/A 13. Is sampling equipment adequate? _____

14. Sample collection procedures:

- ☐ Sample volumes obtained _____
- ☐ Preservation techniques used _____
- ☐ Types of Containers Used _____
- ☐ Samples analyzed in the appropriate time frames _____
- ☐ Adequate number of samples to obtain a representative sample _____
- ☐ Sampling and Analysis Plan Available _____

Y N N/A 15. Are results reported on a dry weight basis? _____

Y N N/A 16. Were percent total solids analyzed? _____

Y N N/A 17. Are chain-of-custody procedures properly employed? _____

Y N N/A 18. Are chain-of-custody records available on site? _____

GENERAL SLUDGE PROCESSES

19. Describe the sludge process control at the facility_____
_____
_____

Y N N/A 20. Does the facility have sludge back-up units/equipment? Describe_____
_____
_____

Y N N/A 21. Does the facility have adequate storage capacity (>30 days)? Describe_____
_____
_____

Y N N/A 22. Are there contingency plans for sludge disposal? Describe_____
_____
_____

Y N N/A 23. Is the solids handling operation adequate to manage volume of sludge? Explain_____
_____
_____

LAND APPLICATION OF BIOSOLIDS

1. Biosolids Beneficial Use practice(s):
   - ☐ Bulk biosolids
   - ☐ Bulk material derived from biosolids
   - ☐ Sold or given away in bag or other container
   - ☐ Other_____

2. Biosolids or material derived from biosolids land applied to:
   - ☐ Agricultural Land
   - ☐ Forest
   - ☐ Reclamation Site
   - ☐ Public Contact Site (park, golf course, etc.)
   - ☐ Lawn or Home Garden
   - ☐ Other_____

Y N N/A 3. Are pollutant concentrations below ceiling concentration values shown in Table I?
(See Table-I on next page)

Y N N/A 4. Do monitoring results show pollutant concentrations below limits in Table III?
(See Table-III on next page)

PATHOGEN CRITERIA

5. Classification of Biosolids with respect to Pathogens:

☐ Class A ☐ Class B ☐ Unknown

Y N N/A 6. Are the appropriate Class A or Class B Pathogen Reduction requirements being met for the disposal practice?

Class A requirements must be met when bulk biosolids are sold or given away to the public for lawn or home garden use or when bagged or containerized (one metric ton or less) biosolids are sold or given away. Also, Class A requirements or Class B requirements with appropriate site restrictions must be met when bulk or bulk derived material from biosolids is applied to agricultural land, reclamation sites, forests or other public contact sites.

7. Indicate which method is used to meet Class A or Class B requirements:

Class A	Class B
☐ A-1 Time and Temperature	☐ B-1 Fecal Coliform < 2,000,000 MPN or CFU
☐ A-2 Alkaline Treatment	☐ B-2 PSRP
☐ A-3 Prior Testing (EV & VHO)	☐ B-3 Equivalent PSRP
☐ A-4 No Prior Testing (EV &VHO)	
☐ A-5 PFRP	
☐ A-6 Equivalent PFRP	

CLASS A RECORDKEEPING CHECKLIST (SKIP IF CLASS B)

Alternative A-1 Time and Temperature ☐ **N/A**

Analytical results are for density of: ☐ Salmonella sp. Bacteria (#/4 g) OR ☐ Fecal Coliform (MPN)

- ☐ Sludge percent Solids ☐ <7% ☐ ≥7% _____%
- ☐ Sludge temperature _____ ºC _____ºF
- ☐ Time temperature maintained _____ Days _____Hours _____Minutes

Table I - CEILING CONCENTRATIONS

Pollutant	Ceiling Concentration mg/kg (dry weight basis)
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

Table III - POLLUTANT CONCENTRATIONS

Pollutant	Ceiling Concentration mg/kg (dry weight basis)
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2,800

CLASS A RECORDKEEPING CHECKLIST - CONTINUED (SKIP IF CLASS B)

Alternative A-2 Alkaline Treatment ☐ **N/A**

Analytical results are for density of: ☐ Salmonella sp. Bacteria (#/4 g) OR ☐ Fecal Coliform (MPN)

☐ Sludge pH (logs of pH from beginning, middle and end of treatment) ≥12 S.U.
☐ Time pH maintained ≥ 12 (minimum 72 hours) _____Hours
☐ Logs of sludge temps from beginning, middle, end and hourly - Minimum 12 hours > 52 ºC (125.6 ºF)
☐ Percent solids in sludge after drying _____ ≥ 50%

Alternative A-3 Prior Testing ☐ **N/A**

Analytical results are for density of: ☐ Salmonella sp. Bacteria (#/4 g) OR ☐ Fecal Coliform (MPN)

☐ Analytical Results (prior to pathogen reduction and, when appropriate, after treatment):
  ☐ Density of Enteric Viruses (1 plaque forming unit per 4 grams of total solids)
  ☐ Viable Helminth Ova (1 per 4 grams of total solids)
  ☐ Detailed Sampling and Analysis Plan Available
☐ Values or range of values for operating parameters to indicate consistent pathogen reduction treatment

Alternative A-4 No Prior Testing ☐ **N/A**

Analytical results are for density of: ☐ Salmonella sp. Bacteria (#/4 g) OR ☐ Fecal Coliform (MPN)

☐ Analytical Results (prior to pathogen reduction and, when appropriate, after treatment):
  ☐ Density of Enteric Viruses (1 plaque forming unit per 4 grams of total solids)
  ☐ Viable Helminth Ova (1 per 4 grams of total solids)
  ☐ Detailed Sampling and Analysis Plan Available

Alternative A-5 Process to Further Reduce Pathogens (PFRP) ☐ **N/A**

Heat Drying ☐ **N/A**

Analytical results are for density of: ☐ Salmonella sp. Bacteria (#/4 g) OR ☐ Fecal Coliform (MPN)

☐ Moisture content of dried sludge _____ < 10%
☐ Logs documenting temp of sludge particles or the wet bulb temp of gas in contact is ≥ 80 ºC (176 ºF) (continuous reading or once per shift, minimum 2 readings per day)

Thermophilic Aerobic Digestion ☐ **N/A**

Analytical results are for density of: ☐ Salmonella sp. Bacteria (#/4 g) OR ☐ Fecal Coliform (MPN)

☐ Dissolved oxygen concentration in digester
☐ Temperature logs 55 ºC – 60 ºC (131 ºF – 140 ºF)
☐ Mean Cell Residence Time (MCRT) 10 days running average _____ days (see equations below)

For complete mixed, constant feed & withdrawal with decanting: $\theta n = \frac{V\ Cv}{q\ Cq}$

V = reactor volume q = flow rate leaving Cv = concentration of solids in reactor
Cq = concentration of solids in existing sewage sludge θn = MCRT (running average solids residence time)

For batch withdrawal, daily step feeding and decanting: $\theta n = \frac{\Sigma\ (\delta s \times \theta)}{\Sigma\ (\delta s)}$ or $\frac{\Sigma\ (Vi \times Ci \times Ti)}{\Sigma\ (Vi \times Ci)}$

δs = an increment of sludge solids that leaves the reactor θ = time period this increment has been in the reactor
Vi = volume of daily batch feed (incremental) to digester Ci = average concentration of solids in daily feed stream

CLASS A RECORDKEEPING CHECKLIST - CONTINUED (SKIP IF CLASS B)

Composting ☐ **N/A**

Analytical results are for density of: ☐ Salmonella sp. Bacteria (#/4 g) OR ☐ Fecal Coliform (MPN)

Composting method: ☐ Windrow ☐ Static Aerated Pile ☐ Within –vessel ☐ Other

☐ Temperature logs: ≥ 55 ºC (131 ºF) for 3 days if within-vessel or static aerated pile method
(continuous reading or one reading per shift, minimum 2 readings per day)

☐ Temperature logs: ≥ 55 ºC (131 ºF) for 15 days if windrow method
(one reading per shift, minimum 2 readings per day)

☐ Records of pile turnings – minimum of 5 if windrow method

Gamma Ray Irradiation ☐ **N/A**

Analytical results are for density of: ☐ Salmonella sp. Bacteria (#/4 g) OR ☐ Fecal Coliform (MPN)

☐ Gamma ray isotope used _____ (e.g., Cobalt 60 or Cesium 137)

☐ Ambient room temperature log (continuous reading or one reading per shift, minimum 2 readings per day)

Alternative A-6 PFRP Equivalent ☐ **N/A**

Analytical results are for density of: ☐ Salmonella sp. Bacteria OR ☐ Fecal Coliform (MPN)

☐ Operating parameters or pathogen levels as necessary to demonstrate equivalent PFRP
(must have written approval from EPA Region 8 and the Pathogen Equivalency Committee (PEC)

Records Documenting Sampling and Analysis for Salmonella sp. Bacteria or Fecal Coliform and Percent Solids

Sampling Records

☐ Dates and times of samples collected
☐ Sampling locations documented
☐ Sample types listed
☐ Sample types appropriate
☐ Sample volumes recorded
☐ Names of persons sampling recorded
☐ Types of sample containers listed
☐ Sample containers appropriate
☐ Methods of preservation including cooling
☐ Sampling quality assurance/quality control (QA/QC) available

Analytical Records

☐ Date and time of sample analysis
☐ Name of analyst
☐ Analytical methods used
☐ Analyses and calculation results properly documented or verifiable
☐ All analyses are reported on a dry weight basis

Name of Contract Laboratory, if applicable: _____

☐ Analytical quality assurance/quality control (QA/QC) available

☐ Analytical results available

CLASS B RECORDKEEPING CHECKLIST (SKIP IF CLASS A)

Alternative B-1 Fecal Coliform Count ☐ **N/A**

☐ Analytical results for density of fecal coliform collected for each sample
☐ Number of samples collected over two-week period _____ (7 minimum)

☐ Geometric Mean Calculation _____ ≤ 2,000,000 MPN or CFU (Standard Methods 9221 E or 9222 D)

Root of the product of n factor - G.M. = $(X_1 * X_2 * X_3 * X_4 * \ldots X_n)^{1/n}$

Common Log Factor - G.M. = Antilog $[(\text{Log}_{10}X_1 + \text{Log}_{10}X_2 + \text{Log}_{10}X_3 \ldots + \text{Log}_{10}X_n)/n]$

X = Fecal Coliform Density (dry weight basis) n = number of samples

Required Site Restrictions (see Figure 2 on back of this page)
☐ Public Access ☐ Harvesting ☐ Grazing

Alternative B-2 Process to Significantly Reduce Pathogens (PSRP) ☐ **N/A**

Aerobic Digestion ☐**N/A**

☐ Dissolved oxygen concentration profile ☐ Total Solids obtained and the feed and withdrawal streams

☐ Mean Cell Residence Time (MCRT) calculations of sludge in digester (see equations below)

For complete mixed, constant feed & withdrawal with decanting: $\theta n = \frac{V\ Cv}{q\ Cq}$

V = reactor volume q = flow rate leaving Cv = concentration of solids in reactor
Cq = concentration of solids in existing sewage sludge θn = MCRT (running average solids residence time)

For batch withdrawal, daily step feeding and decanting: $\theta n = \frac{\Sigma\ (\delta s \times \theta)}{\Sigma\ (\delta s)}$ or $\frac{\Sigma\ (Vi \times Ci \times Ti)}{\Sigma\ (Vi \times Ci)}$

δs = an increment of sludge solids that leaves the reactor θ = time period this increment has been in the reactor
Vi = volume of daily batch feed (incremental) to digester Ci = average concentration of solids in daily feed stream

☐ Temperature logs – 60 days @ 15 ºC (59 ºF) to 40 days @ 20 ºC (68 ºF)
(continuous reading or once per shift, minimum 2 readings per day)

Required Site Restrictions (see Figure 2 on next page)
☐ Public Access ☐ Harvesting ☐ Grazing

Air Drying ☐ **N/A**

☐ Description of drying bed design (sand drying beds, paved, unpaved beds etc.)
☐ Depth of sludge on drying beds _____ (in, ft)
☐ Drying time in days _____ ≥ 3 months
☐ Daily average ambient temperature logs (2 of 3 months, ambient daily temp > 0 ºC (32 ºF)

Required Site Restrictions (see Figure-3 on next page)
☐ Public Access ☐ Harvesting ☐ Grazing

SITE RESTRICTIONS FOR LAND APPLICATION OF CLASS B BIOSOLIDS

Public Access

- Turf grown on land where biosolids have been applied may not be placed on land with a high potential for public exposure unless harvested > 1 year after biosolids application
- Public access is restricted for 1 year for land with a high potential for public exposure
- Public access is restricted for 30days for land with a low potential for public exposure

Harvesting

- Food crops (below ground) are harvested > 20 months after biosolids application when biosolids stay on land for > 4 months prior to incorporation into the soil
- Food crops (below ground) are harvested >38 months after biosolids application when biosolids stay on surface of land for < 4 months prior to incorporation into the soil
- Food crops, feed crops and fiber crops are harvested > 30 days after application of biosolids

Grazing

- Animal grazing not allowed until > 30 days after biosolids application

Anaerobic Digestion ☐ **N/A**

☐ Total Solids obtained and the feed and withdrawal streams
☐ Mean Cell Residence Time (MCRT) calculations of sludge in digester (see equations below)

For complete mixed, constant feed & withdrawal with decanting: $\theta n = \frac{V\ Cv}{q\ Cq}$

V = reactor volume q = flow rate leaving Cv = concentration of solids in reactor
Cq = concentration of solids in existing sewage sludge θn = MCRT (running average solids residence time)

For batch withdrawal, daily step feeding and decanting: $\theta n = \frac{\Sigma\ (\delta s \times \theta)}{\Sigma\ (\delta s)}$ or $\frac{\Sigma\ (Vi \times Ci \times Ti)}{\Sigma\ (Vi \times Ci)}$

δs = an increment of sludge solids that leaves the reactor θ = time period this increment has been in the reactor
Vi = volume of daily batch feed (incremental) to digester Ci = average concentration of solids in daily feed stream

☐ Temperature logs – 25 days @ 35 ºC (95ºF) to 55 ºC (131ºF) and 60 days @ 20 ºC (68ºF)
(continuous reading or once per shift, minimum 2 readings per day)

Required Site Restrictions (see Figure 2 on back of this page)
☐ Public Access ☐ Harvesting ☐ Grazing

Composting ☐ **N/A**

Composting method: ☐ Windrow ☐ Static Aerated Pile ☐ Within –vessel ☐ Other
☐ Temperature logs: ≥ 40 ºC (104 ºF) for 5 days (continuous reading or one reading per shift, minimum 2 readings per day)
☐ Demonstration that for 4 consecutive hours during the 5 days the temperature exceeded 55 ºC (131ºF)

Required Site Restrictions (see Figure 2 on back of this page)
☐ Public Access ☐ Harvesting ☐ Grazing

Lime Stabilization ☐**N/A**

☐ Raised pH ≥ 12 after 2 hours of contact

Liquid Sludge
☐ Quantity of Sludge and Alkali
☐ Single grab, pH at 0 hr._____S.U. @ 2 hr._____S.U.
☐ Temperature of sample _____ºC/ºF (temp correction)

Dewatered Sludge (Cake)
☐ Quantity of Sludge and Alkali
☐ 5 min. composite, pH at 0 hr._____S.U. @ 2 hr._____S.U.
☐ Temperature of sample _____ºC/ºF (temp correction)

pH correction for temperature other than 25 ºC = $\frac{-\ 0.03\ \text{pH Units} * (25\ ºC - T_{measured}\ ºC)}{1.0\ ºC}$

pH new = pH measured – pH correction

Alternative B-3 PSRP Equivalent ☐**N/A**

☐ Operating parameters or pathogen levels as necessary to demonstrate equivalency to PSRP

☐ Operating parameters or pathogen levels as necessary to demonstrate equivalent PFRP
(must have written approval from EPA Region 8 and the Pathogen Equivalency Committee (PEC)

Required Site Restrictions (see Figure 2 on back of this page)
☐ Public Access ☐ Harvesting ☐ Grazing

CLASS B RECORDKEEPING CHECKLIST CONTINUED (SKIP IF CLASS A)

Records Documenting Sampling and Analysis for Fecal Coliform and Percent Solids

Sampling Records

- ☐ Dates and times of samples collected
- ☐ Sampling locations documented
- ☐ Sample types listed
- ☐ Sample types appropriate
- ☐ Sample volumes recorded
- ☐ Names of persons sampling recorded
- ☐ Types of sample containers listed
- ☐ Sample containers appropriate
- ☐ Methods of preservation including cooling
- ☐ Sampling QA/QC available

Analytical Records

- ☐ Date and time of sample analysis
- ☐ Name of analyst
- ☐ Analytical methods used
- ☐ Analyses and calculation results properly documented or verifiable
- ☐ All analyses are reported on a dry weight basis
- ☐ Analytical results available
- ☐ Analytical QA/QC available

Name of Contract Laboratory, if applicable: _____

VECTOR ATTRACTION REDUCTION METHODS

Y N N/A 8. Is a Vector Attraction Reduction method practiced?

One of the VAR methods 1-10 must be used when land applying bulk biosolids to agricultural land, forest, a public contact site or a reclamation site. One of the methods 1-8 must be used when distributing bulk, bagged or containerized biosolids for public or lawn or home garden use.

9. Indicate Vector Attraction Reduction Method used:

- ☐ 1 - 38% Volatile Solids Reduction
- ☐ 2 - Anaerobic Bench Scale Volatile Solids Reduction
- ☐ 3 - Aerobic Bench-Scale Volatile Solids Reduction
- ☐ 4 - Specific Oxygen Uptake Rate (SOUR)
- ☐ 5 - Aerobic Process
- ☐ 6 - Alkaline Stabilization
- ☐ 7 - Moisture Reduction without Unstabilized Primary Solids
- ☐ 8 - Moisture Reduction with Unstabilized Primary Solids
- ☐ 9 -Subsurface Injection
- ☐ 10 - Soil Incorporation

VECTOR ATTRACTION REDUCTION RECORDKEEPING CHECKLIST

Option 1 – Volatile Solids Reduction (VSR) ☐ **N/A**

- ☐ Log data showing VS concentration of raw and withdrawal sludge stream.
- ☐ Composite sample
- ☐ Test Method (SM 2540G) for Total Solids and Total Volatile Solids
- ☐ Holding time and preservation followed (24 hrs 4 ºC for TVS)
- ☐ Calculation showing ≥ 38% reduction of volatile solids using the Van Kleeck Equation (see below)

$$VSR = \frac{VS_{in} - VS_{out}}{VS_{in} - (VS_{in} * VS_{out})}$$

VS_{in} = Fractional VS in feed stream VS_{out} = Fraction of VS from bottom stream

Fractional VS = Fraction of VS vs. Total Solids

Option 2 - Anaerobic Bench-Scale Volatile Solids Reduction ☐ **N/A**

☐ Description of bench-scale digester _____
_____
_____
_____

☐ 15-100 ml flasks flushed with N_2 ☐ Collect 50 ml in each 100 ml flask
☐ Temperature logs (at least two per day) showing temperature between 30 ºC – 37 ºC (86 ºF – 98.6 ºF)
☐ Log showing results of random test of 5 flasks for TS &TVS at 0, 20, & 40 days
☐ Test method (SM 2540G) for TS & TVS
☐ Calculation showing ≤ 17 % reduction of volatile solids using the Van Kleeck Equation (see below)

$$VSR = \frac{VS_{in} - VS_{out}}{VS_{in} - (VS_{in} * VS_{out})}$$

VS_{in} = Fractional VS in feed stream VS_{out} = Fraction of VS from bottom stream

Fractional VS = Fraction of VS vs. Total Solids

Option 3 - Aerobic Bench-Scale VS Reduction ☐**N/A**

☐ Description of bench-scale digester _____
_____
_____
_____

☐ Collection of 12 L of sludge (maintain by adding distilled water daily) @ 2%
☐ If dilution was required, what was used _____(treated effluent)\
☐ Log showing D.O. at least 2 mg/l ☐ Calibration records for D. O. meter
☐ Temperature logs (at least two per day) showing temperature maintained at 20 ºC (68 ºF)
☐ Log showing results of TS & TVS (2 sets every week for 5 weeks)
☐ Test method (SM 2540G) for TS & TVS
☐ Calculation showing ≤ 15 % reduction of volatile solids using the Van Kleeck Equation (see below)

$$VSR = \frac{VS_{in} - VS_{out}}{VS_{in} - (VS_{in} * VS_{out})}$$

VS_{in} = Fractional VS in feed stream VS_{out} = Fraction of VS from bottom stream

Fractional VS = Fraction of VS vs. Total Solids

Option 4 -Specific Oxygen Uptake Rate (SOUR) ☐ **N/A**

☐ Collection of representative sample _____(ml, L, gal.)
☐ Times when samples were collected & tests performed (1 hour holding)
☐ D.O. readings for sludge samples for 15 minutes or less (0,1,2,3…15 min) ☐ D.O. calibration records
☐ Temp readings at beginning and end of procedures ☐ Temp correction performed if not at 20 ºC (68 ºF)
☐ Log showing results of TS for sludge sample (g/l) ☐ Test method (SM 2540G) for TS & TVS
☐ Calculations showing SOUR ≤ 1.5 mg O_2/hr/g TS (2 sub samples) ☐ Avg. of 7 or more calculations
☐ Test Method SM 2710B (Apparatus, Procedure and Calculation), modified by White House Manual (pg. 95)

Option 5 - Aerobic Process ☐ **N/A**

☐ Documentation showing aerobic process time _____ ≥ 14 days
☐ Temperature log (continuous or at least two per day) showing average temperature ≥ 45 ºC (113 ºF) and minimum temperature > 40 ºC (104 ºF) for 14 consecutive days

VECTOR ATTRACTION REDUCTION RECORDKEEPING CHECKLIST CONTINUED

Option 6 – Alkaline Treatment ☐ **N/A**

☐ Log demonstrating pH ≥ 12 S.U. for 2 hours in every batch
☐ Log showing pH remains ≥ 11.5 for 22 hours without additional alkali (include demonstration of adequate mixing)
☐ Test intervals at 0, 2, 24 hours
☐ Amount of sludge treated _____(gal., lbs) ☐ Amount of alkali added_____(lbs., gal.)
☐ Liquid mixture – grab sample, pH testing in each batch ☐ Cake – 5 minute composite, several pH tests per day

Option 7 –Moisture Reduction without Unstabilized Primary Solids ☐ **N/A**

☐ Description of method used to air dry the sludge _____
_____
_____
_____
_____

☐ Results of percent solids (dry weight) test_____ ≥ 75% ☐ Test Method SM 2540G for TS

Option 8 – Moisture Reduction with Unstabilized Primary Solids ☐ **N/A**

☐ Description of method used to air dry the sludge _____
_____
_____
_____
_____

☐ Results of percent solids (dry weight) test_____ ≥ 90% ☐ Test Method SM 2540G for TS

Option 9 – Subsurface Injection ☐ **N/A**

☐ Documentation of compliance (copy of field notes – how injected, class A or B, time elapsed between pathogen reduction and injection, no significant amount on surface after 1 hour)
☐ If Class A – must be injected within 8 hours of discharge from pathogen reduction process

Option 10 – Surface Application with Incorporation ☐ **N/A**

☐ Documentation of compliance (copy of field notes - how incorporated, class A or B, time elapsed between pathogen reduction incorporation)
☐ Surface applied must be incorporated within 6 hours after placed on the land
☐ If Class A – must be incorporated within 8 hours of discharge from pathogen reduction process

COMMENTS

METALS WORKSHEET

	A	B	C	D	E			
Pollutant	Actual Sludge Concentration mg/kg	Table I Ceiling Concentration mg/kg	Table III Pollutant Concentration mg/kg	Table II Cumulative Pollutant Loading Rate kg/ha	Table IV Annual Pollutant Loading Rate kg/ha/yr	Sample Preparation & Analytical Methods SW-846	Preservation/ Holding Time	Sample Type 500 ml
As		75	41	41	2.0	3050/3051+ 6010/7061/7060	Cool 4ºC 180 days	Composite
Cd		85	39	39	1.9	3050/3051+ 6010/7131/7130	Cool 4ºC 180 days	Composite
Cu		4,300	1,500	1,500	75	3050/3051+ 6010/7210	Cool 4ºC 180 days	Composite
Pb		840	300	300	15	3050/3051+ 6010/7421/7420	Cool 4ºC 180 days	Composite
Hg		57	17	17	0.85	7471/7470	Cool 4ºC 28 days	Composite
Mo		75	----------	----------	----------	3050/3051+ 6010/7481/7480	Cool 4ºC 180 days	Composite
Ni		420	420	420	21	3050/3051+ 6010/7520	Cool 4ºC 180 days	Composite
Se		100	100	100	5.0	3050/3051+ 6010/7741/7740	Cool 4ºC 180 days	Composite
Zn		7,500	2,800	2,800	140	3050/3051+ 6010/7950	Cool 4ºC 180 days	Composite

☐ If **A > B** then bulk biosolids or biosolids in a bag or other container **CAN NOT** be beneficially used

☐ If **A ≤ C** then High Quality (HQ) Biosolids

☐ If **A ≤ B** then bulk biosolids or biosolids in a bag or other container **CAN** be beneficially used

☐ If **A > C** then documentation of site loadings

Records Documenting Sampling and Analysis for Metals

Sampling Records

☐ Dates and times of samples collected
☐ Sampling locations documented
☐ Sample types listed
☐ Sample types appropriate
☐ Sample volumes recorded
☐ Names of persons sampling recorded
☐ Types of sample containers listed
☐ Sample containers appropriate
☐ Methods of preservation including cooling
☐ Sampling QA/QC available

Analytical Records

☐ Date and time of sample analysis
☐ Name of analyst
☐ Analytical methods used
☐ Analyses and calculation results properly documented or verifiable
☐ All analyses are reported on a dry weight basis
☐ Analytical results available
☐ Analytical QA/QC available

Name of Contract Laboratory, if applicable: _____

COMMENTS

PARTICIPANTS

Facility Representative Name _____ (print) Title _____ Company/Organization _____ Signature_____Date_____	**EPA Inspector** Name _____ (print) Title _____ Company/Organization _____ Signature_____Date_____
Contractor Representative Name _____ (print) Title _____ Company/Organization _____ Signature_____Date_____	**Other** Name _____ (print) Title _____ Company/Organization_____ Signature_____Date_____