

Nevada Division of Environmental Protection  
Bureau of Water Pollution Control

FACILITY ABANDONMENT  
CLOSURE PLANS

WTS-20  
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The proper abandonment (decommissioning) of a facility, which has been used to treat, store, or dispose of domestic sewage, septage, biosolids or manure requires Nevada Division of Environmental Protection (NDEP) approval of a Closure Plan.

General:

The purpose of this guidance is to ensure that an abandoned treatment facility or Concentrated Animal Feeding Operation (CAFO) will not be an immediate or long-term public health, safety, or environmental hazard. The Closure Plan submitted for NDEP review and approval ahead of closure operations must include the following elements:

1. When the abandonment will occur;
2. How the abandonment will occur;
3. How the wastes will be disposed or treated;
4. If the facility was operated as a municipal sewage treatment works, where the community's sewage treatment will occur in the future;
5. What the site will be used for following facility closure;
6. A list of all businesses/industries, which discharged to the facility;
7. A timeline for completing the Closure Plan;
8. Which person and entity prepared the Closure Plan; and
9. Which person and entity is responsible for implementing the Closure Plan.

NDEP recommends that the Closure Plan be submitted at least forty five (45) days in advance of the commencement of closure operations. A follow up progress report from the Permittee and/or site verification by NDEP inspection staff may also be required prior to NDEP's approval of the discharge permit cancellation.

The categories of regulated facilities addressed in this guidance document, which require an approved Closure Plan include:

A. Sewers

Manholes located in private or public property shall be backfilled with compacted earth, sand, gravel or other approved material (e.g. concrete) and brought up to grade. The manhole frame and cover will be removed. All sewers shall be capped or plugged at the manhole.

B. Septic tanks (Septage)

Note: These requirements apply to NDEP regulated community or commercial septic systems and agricultural sites land applying septage, sewage sludge or grease trap waste. Residential septic system owners should contact the local health district for decommissioning guidance. In all cases, tanks used for storing septage, sewage sludge or grease cannot be reclaimed for potable water use.

The influent sewer shall be plugged or capped. All septage, sewage sludge, grease and sediment (e.g. grit) shall be removed from the tanks by a licensed septage (sewage sludge) hauler and disposed offsite in a manner approved by NDEP. The tanks shall be removed or completely backfilled with compacted earth, sand, gravel or other approved material. Dosing tanks and/or distribution boxes shall be filled or removed. Outlets to the leach fields shall be plugged or capped. Failed leach fields impacted with surfacing effluent shall be disinfected with powdered bleach or lime and barricaded from public access until the soil surface has sufficiently dried. All monitoring wells shall be abandoned and sealed in conformance with the requirements of the Nevada Division of Water Resources.

C. Wastewater Lagoons

The influent sewer shall be plugged or capped. All sewage shall be drained from the piping and disposed of in an approved manner. All mechanical equipment, piping, valves, and liner materials (e.g. plastic and clay liners) shall be removed from the lagoons (ponds) and disposed of in an approved manner. A backfill and grading plan shall be instituted to reclaim the empty basins to the original site topography. Otherwise, any abandoned basin shall require an engineered plan of surface runoff and groundwater interception control to avoid standing, stagnant water. All monitoring wells shall be abandoned (sealed) in conformance with the requirements of the Nevada Division of Water Resources. All sanitary debris and trash shall be removed and properly disposed in a landfill. All sewage sludge shall be removed, dewatered

and disposed of via an NDEP approved method. Sampling of the sludge (biosolids) for pathogens, metals, nitrogen and moisture content is required prior to discharge to a permitted land application site for forage crop (animal feed) propagation. Sampling parameters for the landfill disposal of dewatered biosolids shall be made in accordance with the landfill's waste acceptance criteria. The offsite discharge of lagoon effluent to ground or surface waters is prohibited without a discharge permit from NDEP.

D. Pump Stations and Mechanical Plants

The influent sewer shall be capped or plugged. All sewage, sludge and sediment shall be removed. All tanks shall be removed or completely backfilled with compacted sand, earth, gravel or other approved material. All piping, buildings, equipment, chemicals, other liquids, spare parts, etc. shall be removed. Cleaned piping and equipment may be left in place if buried or located below-grade. Tanks and buildings may remain in place for other uses if they are properly cleaned and retro-fitted so that they are not a safety or environmental hazard. All monitoring wells shall be abandoned in conformance with the requirements of the Nevada Division of Water Resources. All sludge and waste materials shall be removed from the site. The effluent sewer shall be cleaned and removed or plugged.

For mechanical wastewater treatment plants with a capacity of more than 0.5 Million Gallons per Day (MGD) or treatment plants which have received industrial wastewater, the soil in the area of the sludge treatment or storage area (e.g. sludge drying beds) may require testing for hazardous materials including heavy metals. The specific testing parameters will be established by NDEP after consideration of the types of industries which have discharged to the treatment plant, past discharge monitoring reports and other relevant information.

E. Biosolids

*General:*

Biosolids (treated sewage sludge) disposal on the land surface requires a permit issued by NDEP. Surface disposal is defined as the placement of biosolids on the land surface for more than two years following the cessation of treatment of the sewage sludge in a processing unit such as a treatment lagoon or sludge digester. The temporary on-site storage period of biosolids at a treatment works cannot exceed two years without prior, written approval from NDEP. The Closure Plan shall specify the method of biosolids removal, sampling plan and disposal site. Sampling parameters for land application include pathogens, metals, nitrogen and moisture content. If a permitted land application site (e.g. forage crops) is unavailable, the Closure Plan must

indicate the municipal landfill, which will receive the biosolids. Sampling parameters for the landfill disposal of dewatered biosolids shall be made in accordance with the landfill's waste acceptance criteria.

*Pathogens:*

NDEP issues permits for the land application of either Class A or Class B biosolids based on the degree of treatment, which provides the pathogen reduction levels listed below in Table 1. In general, Class B Biosolids application sites require specific public access restrictions including fencing, posting, setbacks to residences and public roads and limitation of the crop's harvest to forage crops such as alfalfa, grass hay or silage grains. Pathogen levels in excess of Class B standards require additional biosolids treatment (e.g. windrow composting) or disposal of the biosolids in a landfill.

Table 1

EPA PART 503 BIOSOLIDS PATHOGEN LIMITS (dry wt. basis)		
Biosolids Class	Fecal Coliform	Salmonella sp. (MPN/gram) <sup>1</sup>
A	< 1,000 MPN per gram	< 3 MPN per 4 grams
B	< 2×10 <sup>6</sup> MPN per gram	-

1. Alternative pathogen demonstration to fecal coliform.

*Metals:*

Land application permits require metals monitoring prior to the biosolids disposal. Biosolids which have metals levels below the Part 503 pollutant concentration limits can be land applied within the crop's agronomic (i.e. nitrogen uptake) requirement. Biosolids which have higher metals levels but that are still below the ceiling concentration limits can be land applied but application rates must be tracked to ensure that either cumulative (kg metal/hectare) or annual pollutant loading rates (kg metal/hectare-yr) are maintained in addition to the nitrogen loading. In all cases, any biosolids material with a metals level exceeding any Part 503 ceiling concentration limit cannot be land applied and instead is to be landfilled in accordance with the landfill's waste acceptance criteria. The Part 503 metals limitations are summarized on the following page in Table 2. Table 3, also on the next page, provides sample agronomic rates. The local cooperative extension office can be contacted for other crop uptake data.

Table 2

EPA PART 503 BIOSOLIDS METALS LIMITS (dry wt. basis)		
Metal	Pollutant Concentration Limit (mg/kg)	Ceiling Concentration Limit (mg/kg) <sup>1</sup>
Arsenic	41	75
Cadmium	39	85
Chromium	1,200	3,000
Copper	1,500	4,300
Lead	300	840
Mercury	17	57
Molybdenum	-	75
Nickel	420	420
Selenium	36	100
Zinc	2,800	7,500

1. Higher metal levels prohibit land application.

Table 3

EXAMPLE AGRONOMIC RATES	
Forage Crop	Nitrogen Uptake (lbs. N/ton crop)
Alfalfa	60
Clover	50
Grass Hay	40
Wheat (silage)	40
Triticale	40
Barley (silage)	35
Sudan or Crested Wheat	33

*Sampling Frequency:*

Part 503 guidelines provide the sampling frequency for pathogens and metals based on the facility's annual biosolids generation rate shown on the next page in Table 4. For a facility that has closed or is undergoing closure and has stockpiled (accumulated) biosolids, the number of samples is based on the estimated dry solids inventory of biosolids on site. The number of representative samples based on the metric tonnage is shown in parentheses in Column 2 of Table 4.

Table 4

DRY SLUDGE DISPOSAL RATE	
Metric Tons per Year <sup>1</sup>	Sampling Frequency (#/yr.)
0 to < 290	Once per year (1)
290 to < 1,500	Once per quarter (4)
1,500 to < 15,000	Once every 2 months (6)
≥ 15,000	Once per month (12)

1. One Metric Ton = 1.1 Tons (U.S.)

F. Concentrated Animal Feeding Operations (CAFOs)

*General:*

Nevada Administrative Code (NAC) Chapter 445A (NAC 445A.228) identifies the threshold permitting levels for CAFOs in Nevada. A summary of these levels based on either animal count or production weight (aquaculture) is provided below in Table 5.

Table 5

CAFO THRESHOLD LEVELS	
Type of Animal	No. of Animals
Cattle (beef)	1,000
Cows (dairy)	700
Horses	500
Swine (> 55 lb.)	2,500
Sheep	10,000
Turkeys	55,000
Chickens (meat)	30,000
Hens (eggs)	82,000
Ducks	5,000
Aquaculture	20,000 lbs. per yr.

*Manure:*

Manure shall be removed from all lagoons, stockpiles, feedlots, corrals (including bedding material), barns, tanks and retention basins. Earthen basins shall be cleaned down to the visible native soil. Manure handling equipment including screening separators shall be cleaned before leaving the site. Manure shall be applied to the agricultural fields specified in the Comprehensive Nutrient Management Plan at the agronomic rate or hauled off-site for third-party distribution. Contact the NDEP Bureau of Waste Management (BWM) for

any additional permitting requirements for a manure composting operation, which provides compost products to the general public.

*Process Wastewater:*

Process wastewater shall be removed from all lagoons, tanks and retention basins and applied to the agricultural fields in accordance with the CNMP. Lagoon inlets and outlets shall be capped or removed. Piping shall be removed or cleaned thoroughly if left in place. Liners including plastic and clay materials shall be removed and properly disposed. A backfill and grading plan shall be instituted to reclaim the empty lagoon basins to the original site topography. Otherwise, any abandoned basin shall require surface runoff and groundwater interception controls to avoid standing, stagnant water.

*Groundwater:*

NDEP requires a plan for post-closure groundwater monitoring and remediation if groundwater monitoring data has indicated current Total Nitrogen levels in excess of 10.0 mg/l in any monitoring well location at the facility. The Closure Plan must provide the method of groundwater nitrogen reduction (e.g. groundwater pumping for crop irrigation). Nitrogen removal from the groundwater is required to demonstrate Total Nitrogen levels  $\leq 10.0$  mg/l in all monitoring wells before NDEP can approve final cancellation of the discharge permit. Data from post-closure groundwater monitoring and remediation shall be reported to NDEP according to the terms of the Closure Plan and discharge permit. Monitoring wells approved by NDEP for closure shall be abandoned (sealed) in conformance with the requirements of the Nevada Division of Water Resources.

References:

- a. *A Plain English Guide to the EPA Part 503 Biosolids Rule*, U.S. EPA Website.
- b. *Closure of Earthen Manure Structures (Including Basins, Holding Ponds and Lagoons)*, University of Nebraska, August, 2006.
- c. *Sludge Management & Closure Procedures for Anaerobic Lagoons*, North Carolina Cooperative Extension Service, Document AG-604.