



**DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
901 South Stewart Street
CARSON CITY, NEVADA 89701-5249
(775) 687-4670
www.ndep.nv.gov**

WTS - 43

**GUIDANCE DOCUMENT FOR DESIGN AND PERMITTING OF A
RESIDUALS DISPOSAL SYSTEM FROM A DRINKING WATER
TREATMENT PLANT**



Information from the items listed below shall be presented as a minimum in an application for a residuals disposal plan from a drinking water plant. The Nevada Division of Environmental Protection (NDEP) reserves the right to require further information as needed or to provide exceptions to the listed items in this guidance. It is recommended that a design summary report (Preliminary Engineering Report) accompany each plan and specification submittal.

This document is solely intended as guidance, and is not regulation. It shall not replace best professional engineering judgment in the design of a drinking water residuals disposal system.

KEY WORDS:

NDEP: Nevada Division of Environmental Protection
ASTM: American Society for Testing and Materials
NAC: Nevada Administrative Code

TABLE OF CONTENTS

- I. Introduction
- II. Permit Application
 - a. Permit Type
 - b. Terms
- III. Design Information
 - a. Siting Criteria
 - b. Wastewater Characterization
 - c. Odor Control
 - d. Dust Control
 - e. Solids Management
- IV. Criteria for Lined Disposal Ponds
- V. Criteria for Solids Drying Bed

Appendices: Checklist, Profile I

I. Introduction

NDEP's Bureau of Water Pollution Control issues state groundwater permits for ponds containing wastewater and residuals. Additionally, the Division can issue permits for residuals drying beds if not covered under another separate permit from another Bureau.

As listed under **NAC 445A.228 Requirement; exemptions.** ([NRS 445A.425, 445A.465](#))

"1. Except as otherwise provided in subsection 2, a person shall not discharge a pollutant from a point source into any waters of this State without obtaining a permit from the Department."

II. Permit Application

An appropriate permit application must be completed and submitted with the appropriate fee to NDEP before a technical review will commence. Please allow 180 days for the permit process to be completed. Application forms and the fee schedule are available at the NDEP website at the following address:
<http://ndep.nv.gov/bwpc/forms.htm>.

a. Permit Type

The owner of the drinking water treatment plant must apply for a state groundwater discharge permit (NSxxx) if the residuals are discharged to lined ponds or solids drying beds.

b. Permit Terms

The reporting requirements and permit limitations will be listed in the discharge permit. These permits are effective for a maximum of five years and require submittal of quarterly reports to NDEP. The design engineer should consult with the permit writer to discuss the draft permit conditions so that there is no mis-understanding on the final permit. There is a minimum of 30-days provided for comments on the draft permit (by the permittee and the public).

Typical permit requirements include flow monitoring of the discharge via an acceptable measuring device (flume, weir, magnetic meter, etc.) and sampling of the discharge. Standard samples can include TDS, TSS, nitrates, arsenic, and other parameters as applicable. Additional constituent monitoring may be required at the NDEP's discretion.

III. Design Information Applicable to All Systems

a. Siting Criteria

A site map shall be provided that depicts the area's topography, nearby dwelling units, wells, and adjacent water bodies (streams, lakes, etc.). The system should not be installed in the 100-year flood plain. If the system is installed in an area subject to flooding, specific engineering safeguards must be in-place to assure the system will not be adversely affected by a flood event.

The groundwater gradient and direction, depth to groundwater, and groundwater quality shall be provided. All wells within 2000 feet should be identified.

b. Wastewater Characterization

The design engineer shall provide NDEP a Profile I (see appendix) analysis of the wastewater (back wash water, residuals slurry, etc.). Engineering references from similar projects can be used for determination of flows and quality if there is no sampling data available.

c. Odor Control

The NDEP guidance document WTS-21 shall be followed. If objectionable odors are documented from the disposal system operation, the permittee will be required to take steps to reduce the odors.

d. Dust Control

A plan for controlling fugitive dust shall be documented and in place prior to use. Transport of fugitive dust from the facility property will be prohibited.

e. Solids Management

A plan for removing solids (dry or wet) from the disposal system must be provided. This plan shall list the steps taken to safeguard the liner of the system during solids removal.

IV. Criteria for Lined Disposal Ponds

- a. If the method of residuals disposal is planned for a lined pond system, the NDEP will use WTS-37 as the guidance on the pond design. This document is available from NDEP and is posted on the NDEP website at:

<http://ndep.nv.gov/bwpc/fact01.htm>

- b. Provisions shall be made for pumping equipment or other sludge removal equipment access at each pond.
- c. Pond supernatant should be returned to the treatment process at appropriate locations and at acceptable rates.

V. Criteria for Solids Drying Bed

- a. The solids drying bed area shall be calculated based upon the volume of wet solids produced, local climate, supernatant/underdrain return rates, and dry solids removal rates.
- b. A bottom liner on the drying beds shall be reviewed on a case by case basis, but must be designed to prevent migration of leachate into the subsurface. This liner shall have the equivalency of 12 inches of compacted material that meets a max permeability rate of 10^{-7} cm/second.
- c. Drying bed walls should extend 18 inches above the bottom bed surface and at least 9 inches below the surface of the bed. The outer walls shall be water tight down to the bottom of the bed and extend at least 4 inches above the ground surface.
- d. Solids removal access shall be provided in the design of each bed. It is recommended that concrete runways be spaced to accommodate mechanical equipment access. Entrance ramps should lead down to the level of the drying surface.
- e. A plan for the return of supernatant to the treatment plant shall be evaluated.

WTS-43
Checklist

- _____ Contact Nevada Division of Environmental Protection's Bureaus of Water Pollution Control and Safe Drinking Water to discuss project
- _____ Coordinate with local government for acceptance of project
- _____ Complete application for groundwater or surface water discharge permit and submit to NDEP with appropriate fees
- _____ Submit Preliminary Design Report to NDEP for review
- _____ Submit draft plans and specifications for project
- _____ Submit final plans and specifications for project, incorporating NDEP review comments.
- _____ Review the draft permit and submit comments to NDEP within 30-day public comment period.
- _____ Receive final permit and initiate construction of project. (Note construction may be allowed after final plan review and prior to final permit issuance)
- _____ Submit Construction Certification Letter on project. If significant change order was encountered during construction, an As-Built Drawing for the project must be submitted to NDEP.
- _____ Submit draft operation and maintenance manual to DEP for review within 90-days of plant start-up or a permit specified deadline.

ATTACHMENT 1

I. Nevada Profile I

Metals

Aluminum
Barium
Beryllium
Calcium
Chromium (total)
Copper
Iron
Magnesium
Manganese
Nickel
Potassium
Silver
Sodium
Zinc
Arsenic
Cadmium
Lead
Selenium
Thallium
Mercury

Inorganic Compounds/Characteristics

Alkalinity
Chloride
Cyanide, WAD
Fluoride
Nitrate (as N)
Nitrite
Nitrate/Nitrite
pH
Sulfate
Total Dissolved Solids

Note: With appropriate metal digestions and filtrations.