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| --- | --- |
| Minnesota Pollution Control Agency (MPCA), 520 Lafayette Road North, St. Paul, MN 55155-4194 | Vacuum Filtration Design Checklist  NPDES/SDS Permit Program  National Pollutant Discharge Elimination System (NPDES)/ State Disposal System (SDS)  Doc Type: Plan/Specification Review Summary |

**Purpose:** This checklist is intended for use by design engineers, to assist Minnesota Pollution Control Agency (MPCA) review engineers in the efficient review of planning and design documents. The information requested is the minimum technical data necessary for MPCA staff to review proposed designs and to determine whether there is reasonable assurance that the treatment system, when constructed, will comply with permit conditions, regulations, and criteria of the MPCA.

**Instructions:** The information in this checklist is based on the ***Recommended Standards for Wastewater Facilities published by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (Ten State Standards) 2014 Edition,*** other accepted engineering references, and MPCA recommendations. Specific references, other than Ten State Standards, are listed where appropriate. The checklist is organized according to the numbering sequence found in Ten State Standards to allow for ease in locating the entire content and text of the recommendations.

The checklist is designed so that a “**yes**” answer indicates compliance with Ten State Standards et al.

A “**no**” answer indicates a deviation from Ten State Standards et al. Answering “no” to any question will require justification that can be provided at the end of the checklist and possibly supporting information, from wastewater treatment plant operational data, to demonstrate how the intent of the recommendation will be met. Additional information may be requested based on site specific conditions.

A “**N/A**” answer means not applicable because the equipment associated with the question is not included in the design.

Wastewater Treatment Facility information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** (mm/dd/yyyy): | |  | **MPCA Project No:** |  |
| **Title of project:** |  | | | |

Permittee information

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Facility name: | |  | | | | |
| Contact name and title: | | |  | NPDES/SDS Permit No: | MN |  |
| Email: |  | | | Phone number: |  | |

Design Engineer information

|  |  |  |  |
| --- | --- | --- | --- |
| Contact name: |  | Contact phone number: |  |
| Email: |  |  |  |

**Phase:**  Planning Phase  Design Phase

**Type of sludge:**  Primary  Secondary  Waste Activated  Combination

Influent Characteristics

|  |  |  |  |
| --- | --- | --- | --- |
| Feed solids concentration: |  | % |  |
| Feed rate: |  | gpm |  |

88.3 Mechanical Dewatering Facilities

*(Only use a “NA” answer if the equipment associated with the question is not included in the design)*

| ***88.31 General*** | | | | **Yes** | **No** | **N/A** |
| --- | --- | --- | --- | --- | --- | --- |
| Are provisions made to maintain sufficient continuity of service so that sludge may be dewatered without accumulation beyond storage capacity? | | | |  |  |  |
| Are the number of vacuum filters, centrifuges, filter presses, belt filters, other mechanical dewatering facilities or combinations thereof sufficient to dewater the sludge produced with the largest unit out of service? | | | |  |  |  |
| Unless other standby wet sludge facilities are available, are adequate storage facilities of at least four days production volume, in addition to any other sludge storage needs, provided? | | | |  |  |  |
| Is documentation provided justifying the basis of design of mechanical dewatering facilities? Provide documentation. | | | |  |  |  |
| Identify number of units: |  | | | | | |
| Identify dimensions of drain: |  | inches | | | | |
| Identify surface area of drain: |  | in2 | | | | |
| Identify cake yield: |  | lbs/ft2/hr | Varies from 1-15 lbs/ft2/hr, depending on the type of sludge (MOP 8 1998) | | | |
| Identify solids capture rate: |  | % | Varies from 85-99% depending on filter media, vacuum pressure, and feed solids characteristics (U.S. EPA February 1980 and MOP 8 1998) | | | |
| Identify cake solids content: |  | % | Varies from 12-50% depending on type of conditioning, filter cycle time, and submergence (MOP 8 1998) | | | |
| Identify filtrate solids concentration: |  | mg/L | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***88.32 Water Supply Protection*** | | | | | |
| Are provisions for water supply to mechanical dewatering facilities provided in accordance with Paragraph 56.23? | | |  |  |  |
| ***88.33 Auxiliary Facilities for Vacuum Filters*** | | | | | |
| Are back-up vacuum and filtrate pumps provided? | | |  |  |  |
| Identify size of vacuum pumps: |  | CFM | | | |
| If the installed units can easily be removed and replaced, are uninstalled back-up vacuum and filtrate pumps available for every three or less vacuum filters? | | |  |  |  |
| Is at least one filter media replacement unit provided? | | |  |  |  |
| Identify type of filter media: |  | | | | |
| Are there provisions for a filter cloth washing system? (U.S. EPA February 1980) | | |  |  |  |
| ***88.34 Ventilation*** | | | | | |
| Are adequate facilities provided for ventilation of the dewatering area in accordance with Paragraph 42.75? | | |  |  |  |
| Is the exhaust air properly conditioned to avoid odor nuisance? | | |  |  |  |
| ***88.35 Chemical Handling Enclosures*** | | | | | |
| Are lime mixing facilities completely enclosed to prevent the escape of lime dust? | | |  |  |  |
| Is chemical handling equipment automated to eliminate the manual lifting requirement? Refer to Section 57. | | |  |  |  |
| Identify chemical(s) to be used: |  | | | | |
| Identify chemical doses: |  | | | | |
| **88.4 Drainage and Filtrate Disposal** | | | | | |
| Will filtrate from dewatering units be returned to the wastewater treatment process at appropriate points and rates? | | |  |  |  |
| Identify location for return of filtrate: |  | | | | |
| Will sampling equipment be provided as needed to monitor drainage and filtrate waste streams? Refer to Paragraphs 56.7 and 84.64. | | |  |  |  |

|  |
| --- |
| Justification for all questions answered with a “no |
|  |
| Additional comments: |
|  |

**References**

GLUMRB (2014 Edition) *Recommended Standards for Wastewater Facilities* (Ten State Standards), Health Research, Inc., Health Education Services Division, Albany NY.

U.S. EPA (February 1980) *Innovative and Alternative Technology Assessment Manual,* U.S. EPA Office of Water Program Operations, U.S. Environmental Protection Agency, Washington, D.C. and Municipal Environmental Research Laboratory, Office of Research and Development, U.S Environmental Protection Agency, Cincinnati OH. (U.S. EPA February 1980)

WEF (1998) *Design of Municipal Wastewater Treatment Plants, Manual of Practice No. 8*, Water Environment Federation, Alexandria, VA. (MOP 8 1998)

**Acronym definitions**

CFM cubic feet per minute

ft2 feet squared

in2 inches squared

gpm gallons per minute

lb/ft2/hr pounds per feet squared per hour

mg/L milligrams per liter