



Minnesota
Pollution
Control
Agency

Water Quality

Wastewater
Technical
Review and
Guidance

FILTRATION – REVIEW CHECKLIST

Water/Wastewater/#5.25, May 2001

FACILITY NAME

DATE

CONSULTING ENGINEER

SITE INSPECTION (DATE & INSPECTOR)

PLANNING OR DESIGN PHASE

Influent

- a) Flow rate (gpm)
average wet weather
peak hourly
- b) Flow equalization will moderate filter
Influent quality and quantity

Filter Type

- a) Pressure or gravity, up flow or down
flow. Gravity type preferred where
abnormal quantities of grease or similar
solids are expected.
- b) Media (single, dual, and material)
- c) Dimensions
- d) Number and Surface Area (ft²) for each
unit (minimum 2 units)

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Hydraulics

- a) Filtration Rate (gpm/ft²) based on total area with one unit out of service

- 1) Maximum allowable is 5 gpm/ft² (based on peak hourly flow and all filters in service)

- b) Total system head loss provided (ft)

- c) Hydraulic & organic load of backwash water should be considered

Media Type

- a) Selection of media type or types will depend on specific site conditions. For multi-media filters considerations should be given to media compatibility.

- b) Media specifications shall include effective size, depth, and type(s).

- c) Uniformity coefficient maximum is 1.7.

Backwash

- a) Backwash source location (should be filtered water)

- b) Water backwash rate; should expand each media layer a minimum of 20% with a minimum backwash period of 10 minutes

- c) Volume of water needed per backwash (gal)

- d) Clear well volume (gal) and/or used backwash storage.
Min: 2 backwash volumes

- e) Rate at which used backwash is returned to plant (max. 15% of average wet weather flow)

- f) Size and number of backwash pumps; should be sized to provide required rate to any filter with largest pump out of service.



- g) Air scour rate, if provided (scfm/ft²) and equipment used _____
- h) Surface spray rate (gpm) _____
- i) Method for measuring and controlling backwash rate _____
- j) Backwash initiation controlled by total head loss or effluent turbidity or both. _____
- k) Positive means for shutting flow off filter being backwashed, and for controlling backwash rate. _____
- l) Underdrain system for even distribution of backwash water (without clogging from solids) _____
- m) Graded gravel or other type of supporting media to aid in distribution of backwash water and to prevent loss of media. _____

Appurtenances

- a) Washwater troughs _____
- b) Surface wash equipment _____
- c) Influent & effluent sampling points _____
- d) Provisions for periodic chlorination of filter influent and backwash water _____

Controls

- a) Manual over-ride for automatic controls (including each individual valve) essential to filter operation) _____
- b) Manual controls _____
- c) Controls should be enclosed and protected against high humidity and/or weather conditions if outside. _____
- d) Means of dewatering filter _____
- e) Is influent fed to filters by gravity or pumps? _____



Miscellaneous

a) Breakthrough turbidity

b) Filters should be housed

c) Ready and convenient access should be provided to all components and the media surface without taking other units out of service.

d) Pre-treatment (chemical coagulation, sedimentation, etc.) should proceed filters if:

1) Effluent Suspended Solids limitations are less than 10 mg/l

2) Secondary effluent can fluctuate

3) Filters follow treatment with a significant amount of algae

e) To prevent accidental dewatering of media, elevation of clear well (or stilling box overflowing to clear well) should be above the surface of the media.
