Reed Bed Sludge Removal

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McMAHON ENGINEERS ARCHITECTS

Wisconsin Wastewater Operators' Association, Inc. WWOA

WWOA Spring Biosolids Symposium

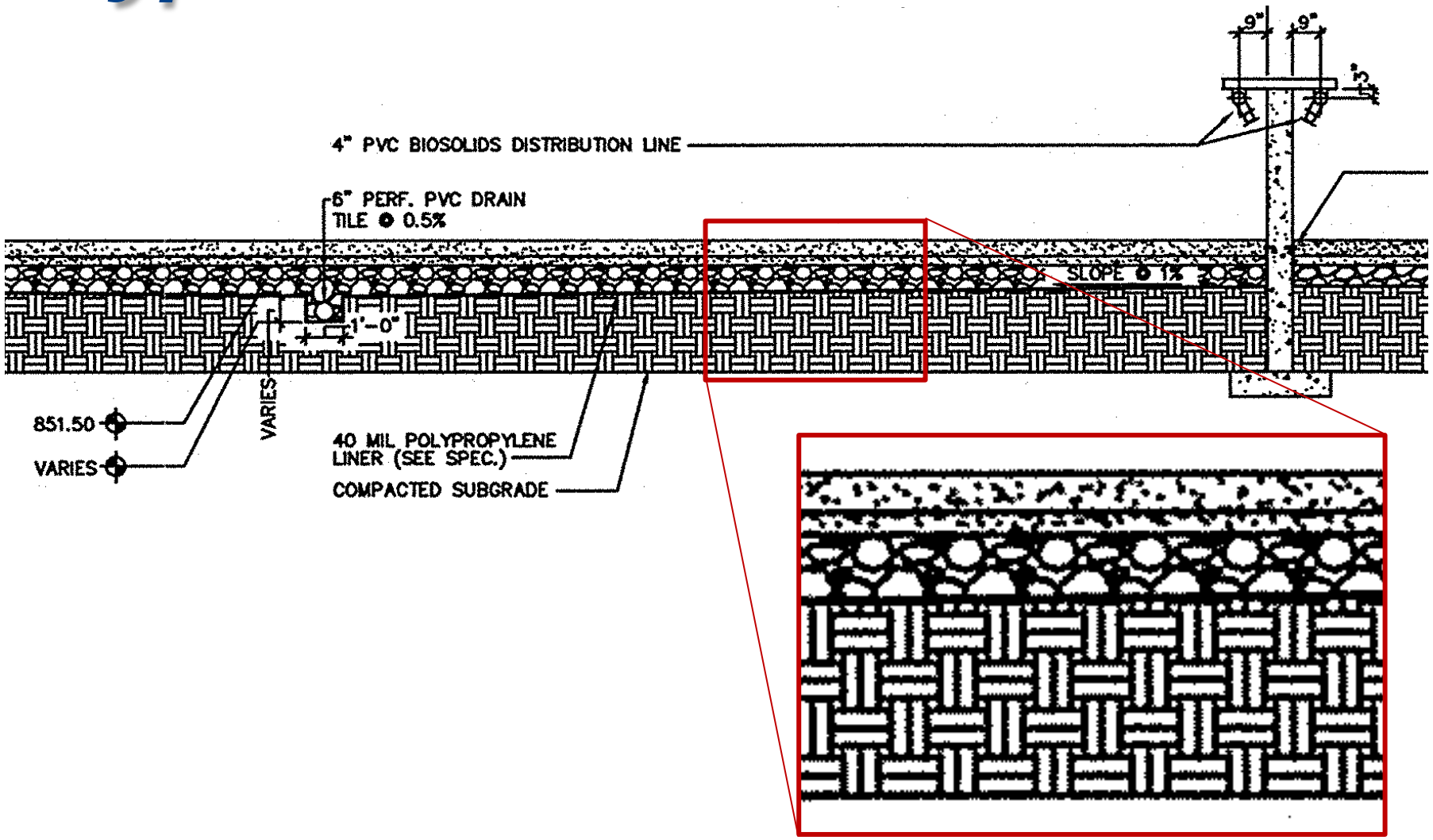
Reed Bed Systems in Wisconsin

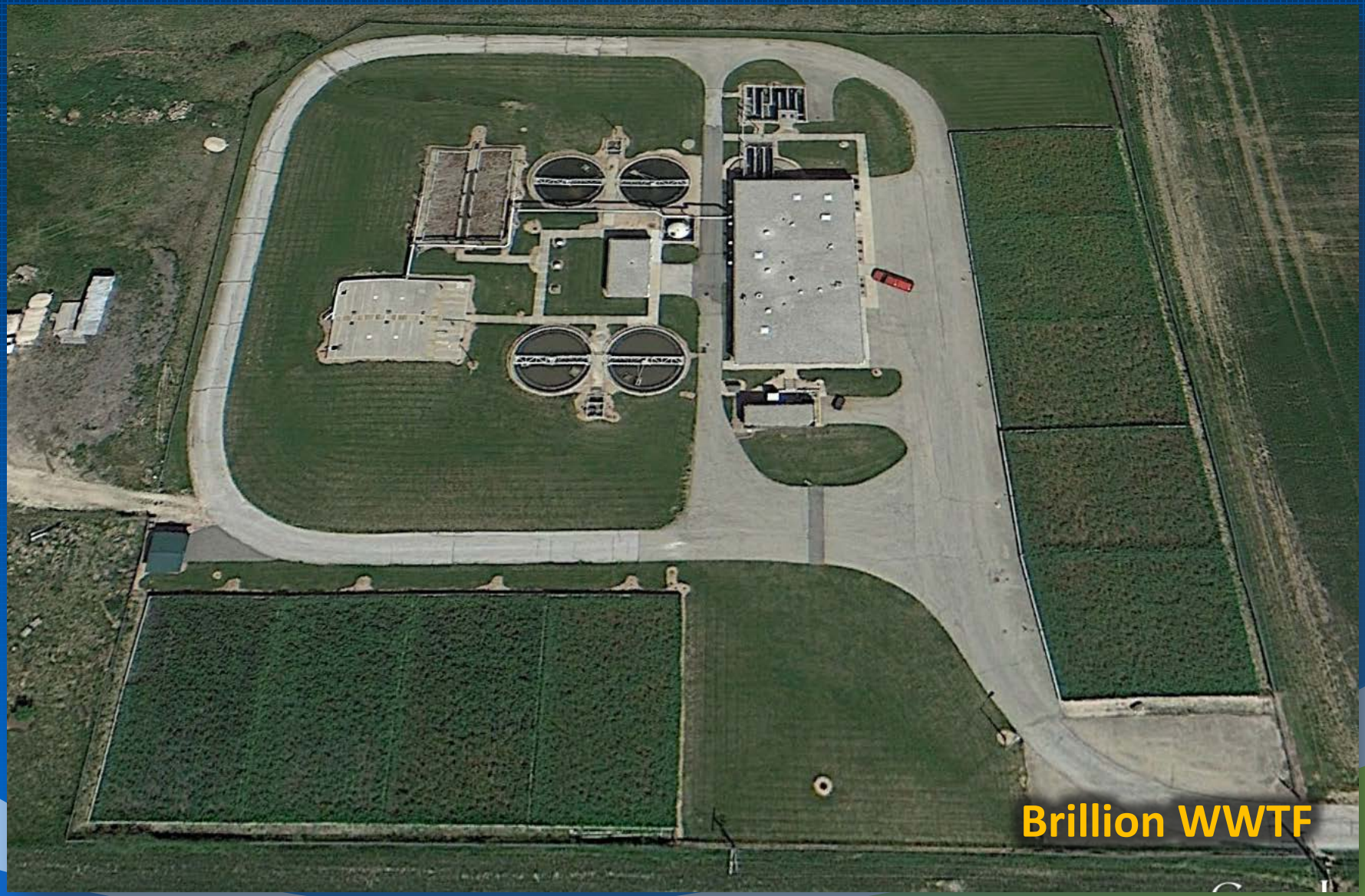
- **Stephensville WWTF**
- Marion WWTF
- **Bear Creek WWTF**
- **Brillion WWTF**
- **Sherwood WWTF**
- **Kewaunee WWTF**
- **Ephraim WWTF**
- **Egg Harbor WWTF**
- Wittenberg WWTF
- Danbury (Joint Water Quality Commission)
- Bayfield (Greater Bayfield WWTP Commission)
- Washburn WWTF
- **Crandon WWTF**
- **Lomira WWTF**
- **Belgium WWTF**
- Abbotsford WWTF
- Arcadia WWTF
- Red Cliff (EPA)
- **Oneida (EPA)**

Construction of the Reed Beds

- Typically Reed Beds are constructed with concrete side walls
- PVC liner is used to make the beds impermeable
- Perforated underdrain system usually connected to the head of the plant
- Less than two feet of gravel and sand
- 4 feet of freeboard ±
- Biosolids distribution system

Typical Reed Bed Construction




Brillion WWTF


Sherwood WWTF

Root System Phragmites (Common Reed)

- Non-Native Reed – Invasive Species
- Prolific Growers
- Can spread through nodes/rhizomes and seeds
- Requires caution when removing plants/sludge from beds


Root Stalks


Fully Grown

Evacuation of Reed Beds

- Eventually biosolids will accumulate to a depth of 3 to 3 1/2 feet
- Bed are taken out of service for six months, usually in the fall
- This allows time for the biosolids to dry and degrade
- Sludge and reeds removed and landfilled
- Beds emptied late summer/fall. Provide enough time to start to regrow before frost.

Sludge Removal

- **Only small-tracked equipment can be used in beds to prevent damage to liner or rutting**
- **5 inches of sludge to remain to protect existing root structure**
  - Frequent hand measurements
- **Removed reeds should be placed in bottom of truck and covered with Sludge**
- **Removed sludge placed directly in trucks and hauled to landfill**
- **Beds must be finish graded – level to within 1 inch across bed**

Weather An Important Consideration

- **Beds should not be emptied during rain events or when beds are excessively wet**
  - Impacts tipping fee at landfill
  - Liquid out of gate when hauling
  - Track mud/sludge off-site
- **Beds should not be emptied when very windy**
  - Sludge or Reed Bed stalks blowing in wind
- **If excessively dusty – may need to add water**

Best Management Practices (BMP)

- Follow BMP for Preventing Spread of Invasive Species in Wetlands
- Wear disposable shoe covers of footwear
- Inspect clothing before leaving site
- Inspect trucks – broom off before leaving for landfill
- Cover loads
- Power wash equipment on-site at completion of project


CAT


PETERS
CAT


Bobcat


KOMAT
CAT

Checking Sludge Depth


CAUTION


558


Finished Bed

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