



Town of

*Orleans*  
Massachusetts

# Water Quality and Wastewater Planning

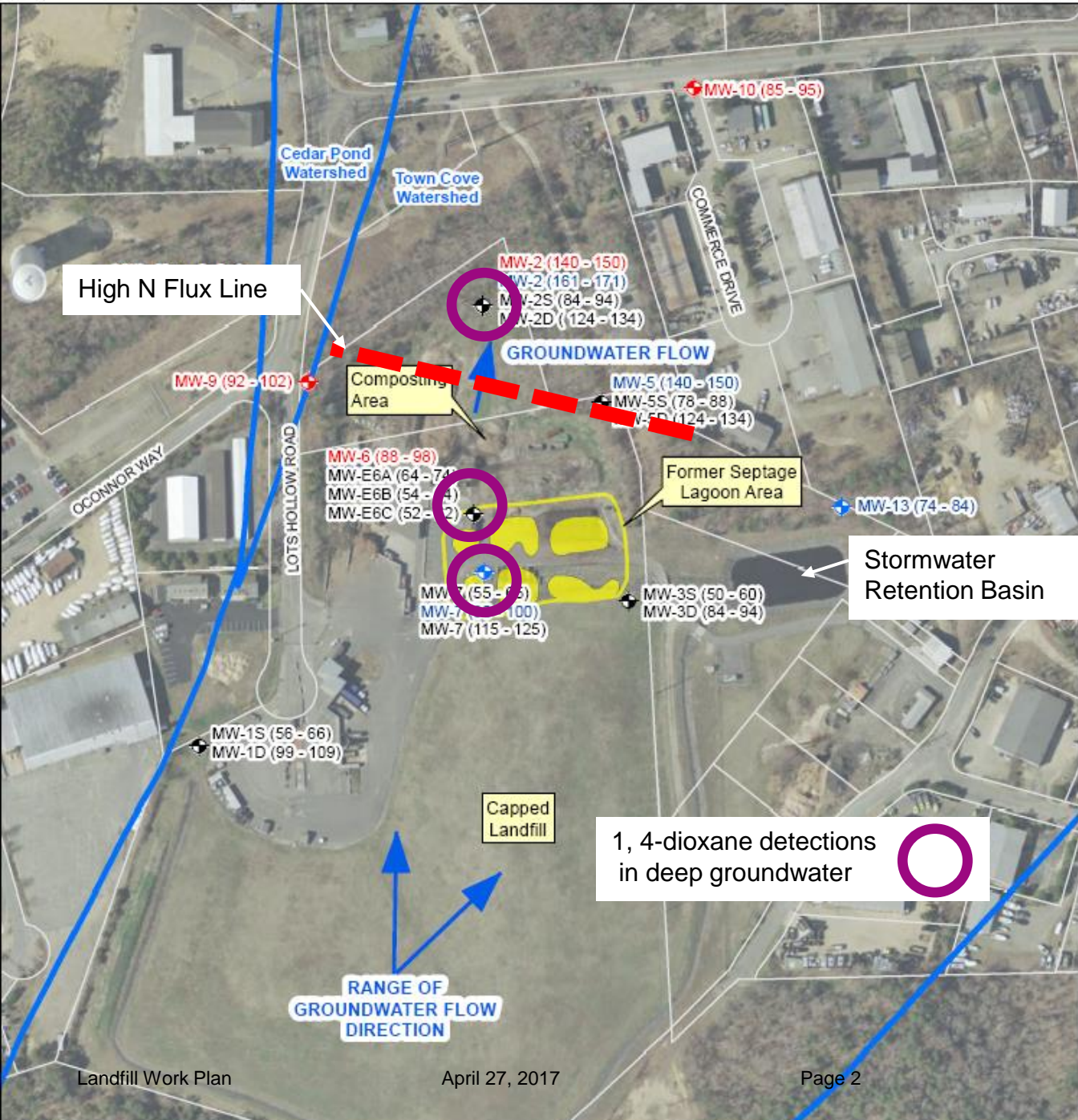
## Landfill Work Plan

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Mark Owen, AECOM Technical Services, Inc.

April 27, 2017



# Landfill Update



**FIGURE 4.**

**TOWN OF ORLEANS, MA  
WATER QUALITY AND  
WASTEWATER PLANNING**

**TOWN LANDFILL  
MONITORING WELL LOCATIONS**

**Legend**

- Landfill Monitoring Program/ Previously Existing AECOM Monitoring Well
- Phase 1 Monitoring Well
- Phase 2 Monitoring Well
- MEP Subwatershed

MW-2 (140 - 150) Phase 1  
 MW-2 (161 - 171) Phase 2  
 MW-2S (84 - 94) Previous  
 (84-94) Screen-Depth Below Land Surface

0 100 200 Feet

**AECOM**





Town Cove

40 Years

20 Years

1,940 feet

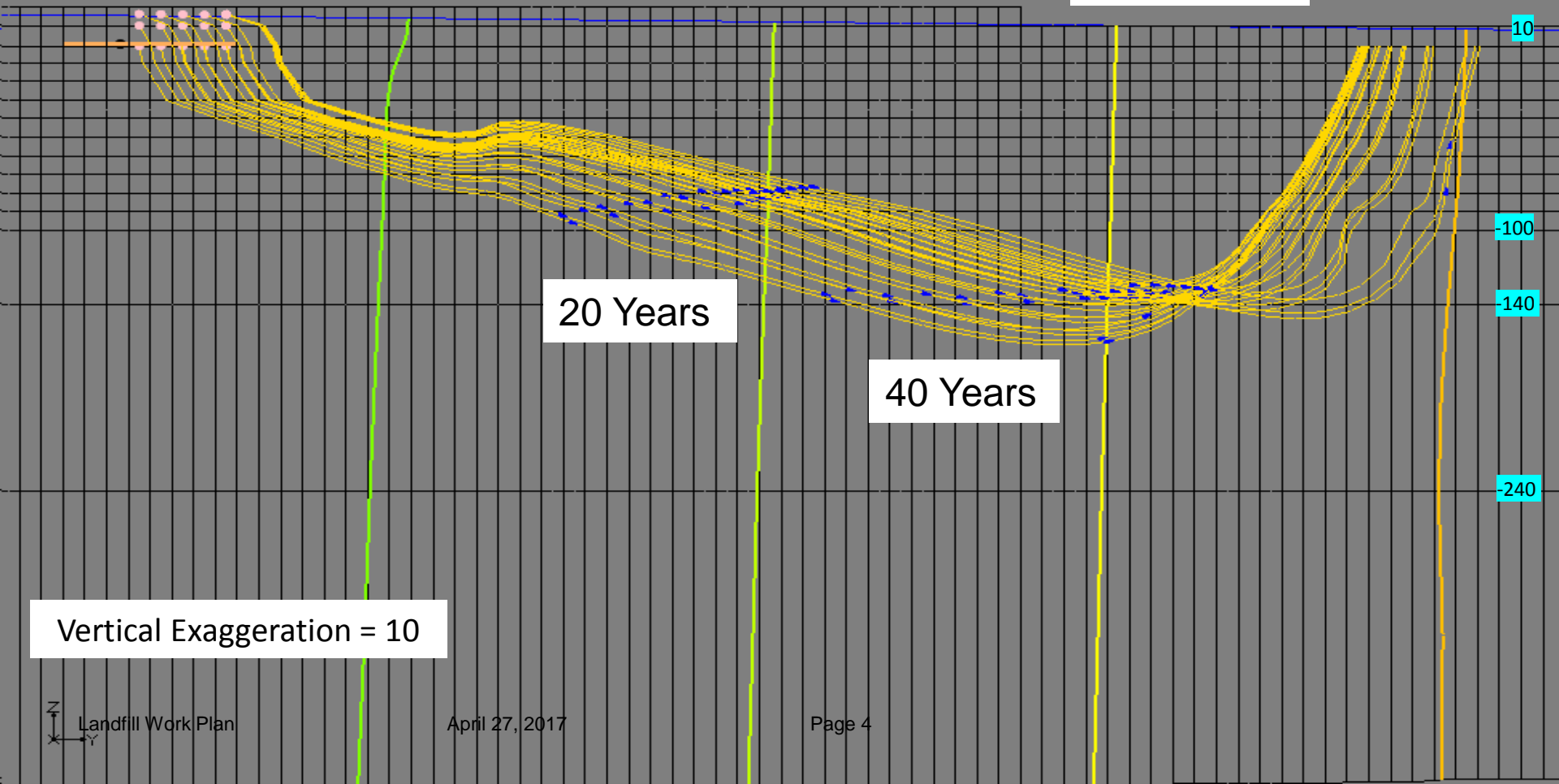
880 feet

Landfill



Landfill

Town Cove



20 Years

40 Years

Vertical Exaggeration = 10



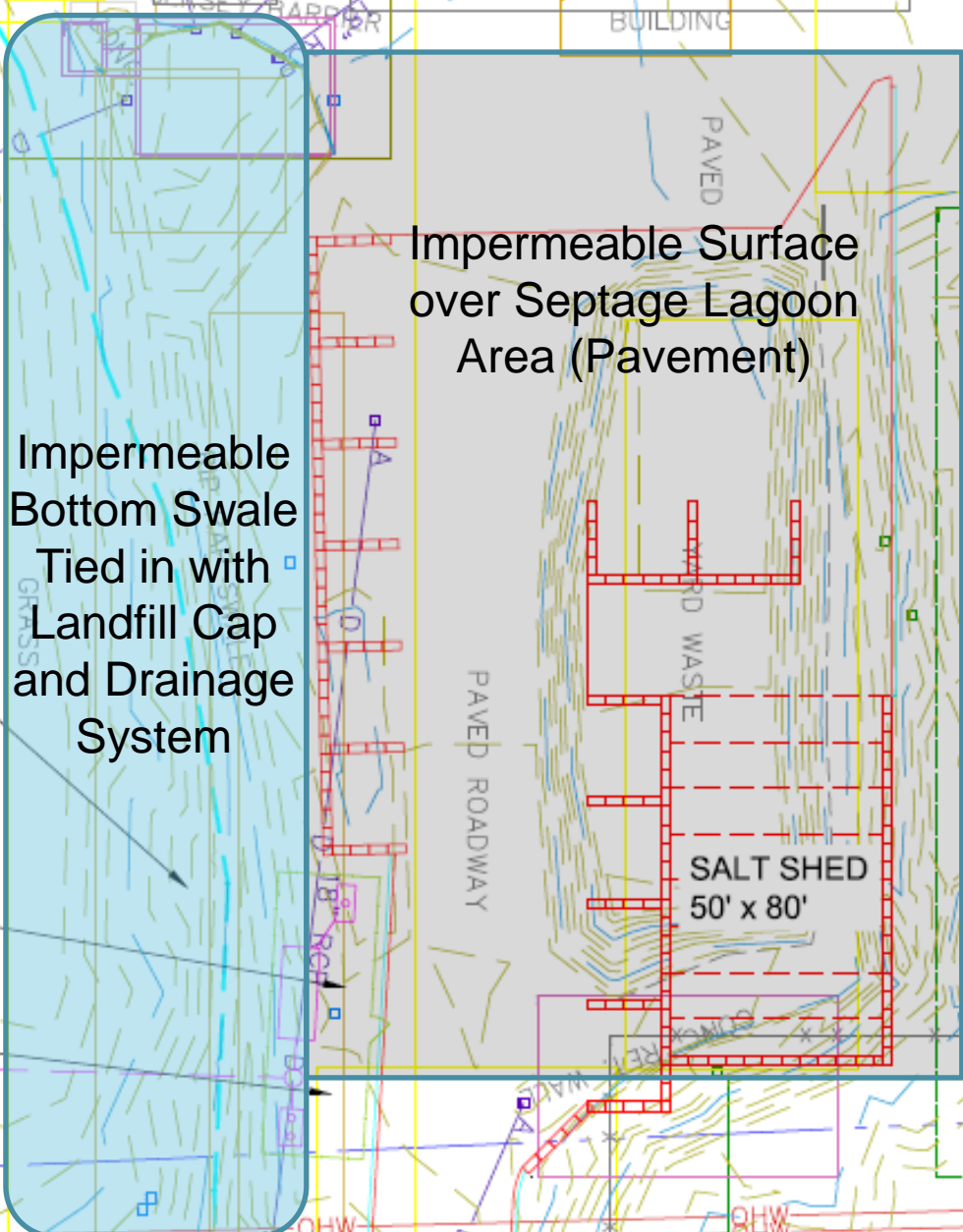
# Landfill Response Actions

- ❖ Modify Salt Shed and Materials Area to Include Impermeable Pavement over Septage Lagoons
- ❖ Replace Leaching Drainage Swale on North Side of Landfill Cap with Swale or Culvert with Impermeable Base
- ❖ Add Stormwater Treatment BMPs Prior to General Stormwater and Compost Area Runoff Infiltration
- ❖ Capture High Nitrogen Flux Groundwater North of Landfill for On-site Treatment with Nitrification/Denitrification Biofilters

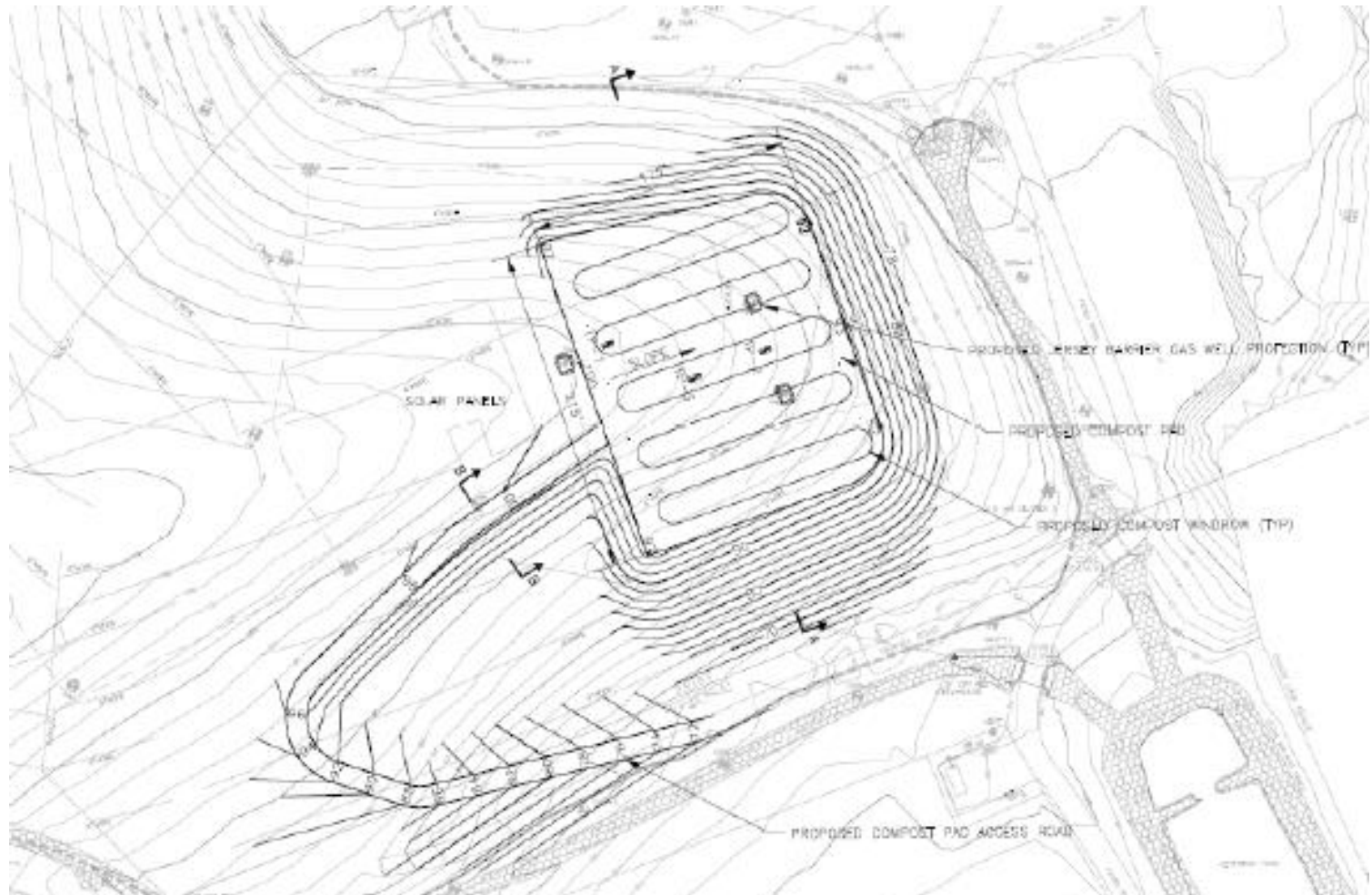




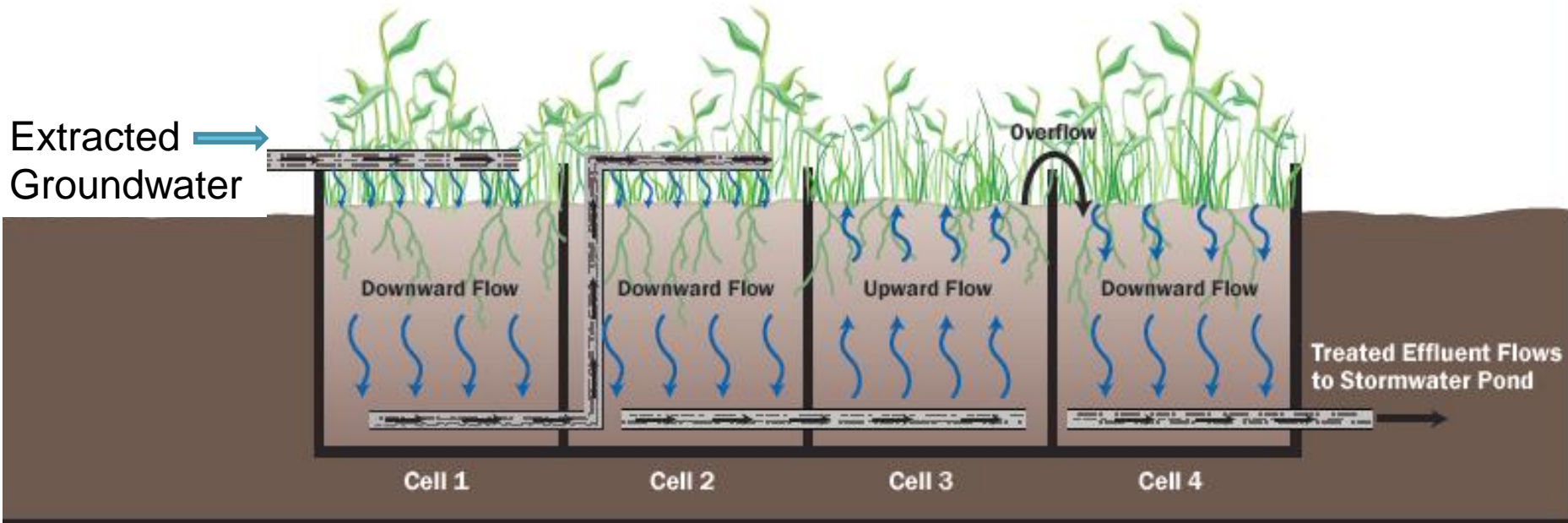
# Landfill Corrective Actions to Minimize infiltration Through Waste Lagoons



# Compost Area Relocation Add Leachate Treatment and/or Reuse



# Nitrification/Denitrification Bio-Filter System

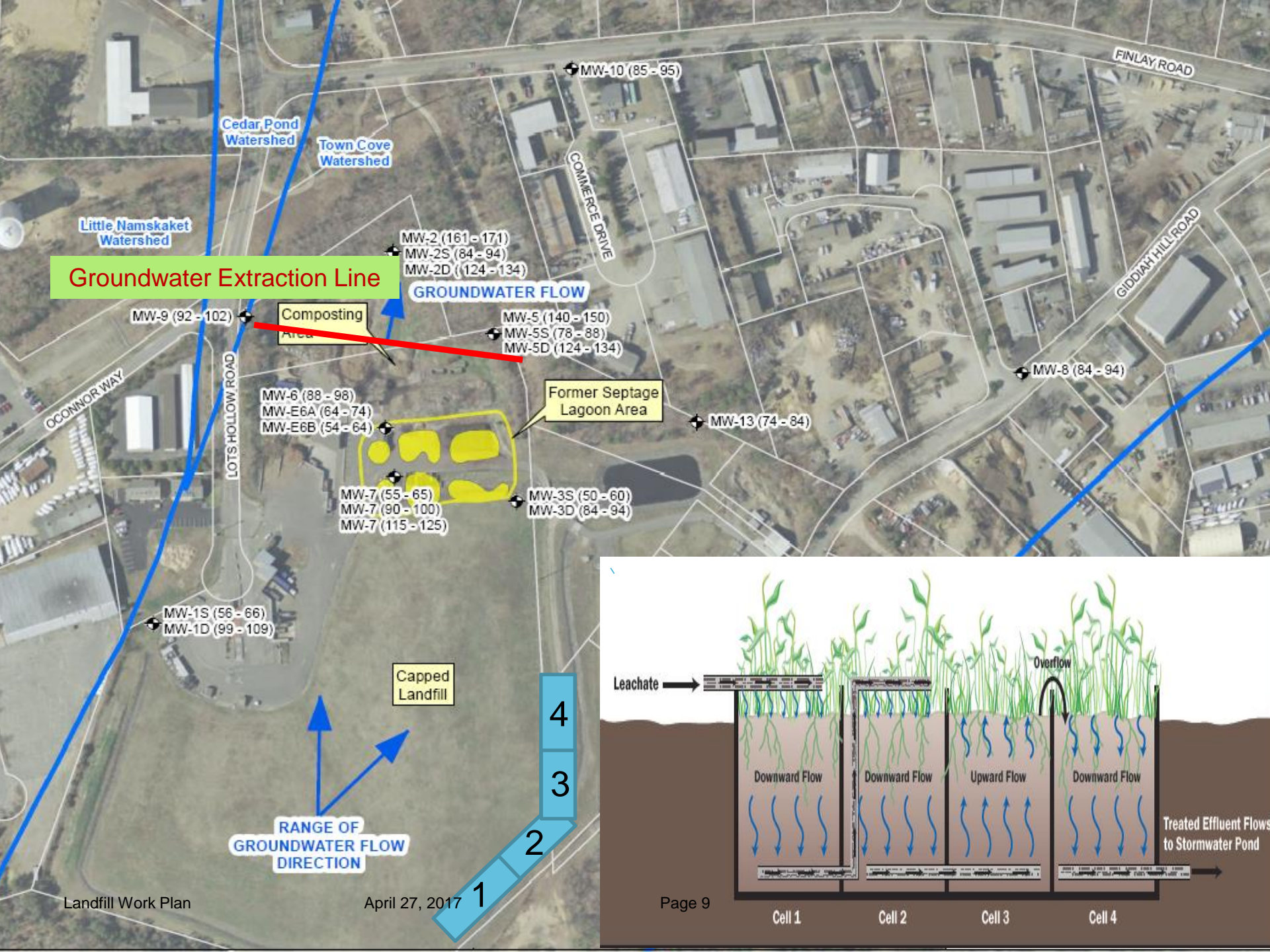


Nitrification    Nitrification    Denitrification    Polishing

Carbon Source (Wood)







**Groundwater Extraction Line**

**GROUNDWATER FLOW**

**RANGE OF GROUNDWATER FLOW DIRECTION**

# Next Steps

- ❖ Near Term (few weeks)
  - Complete Phase 2 Assessment with Evaluation of Risk and Remedial Action Plan
  - Modify Pavement Plans for DPW Materials Area
- ❖ Develop Scope for Design/Implementation Plan for Nitrogen Mitigation Systems
  - Drainage Swale Modifications
  - Stormwater Treatment BMPs
  - Groundwater Extraction System
  - Biofilter Treatment System
- ❖ Implement Designs in Fall 2017





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Thank You