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PLANNING AHEAD

Implementing an Odor Control Strategy for Middlesex County Utilities Authority

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05/12/2026 | 3:30 pm

Agenda

1. MCUA Overview
2. Odor Sampling and Monitoring
3. Dispersion Modeling
4. Odor Control Strategies
5. New Odor Control System Evaluation
6. Current Updates

01 MCUA Overview

Middlesex County Utilities Authority

- Central Treatment Plant in Sayreville, NJ
- ~ 950,000 industrial, commercial, and residential users
- 147 MGD Design Capacity
- ~ 90 MGD Average Daily Flow
- Liquid Treatment Process
  - Grit Removal
  - Primary Sedimentation Tanks
  - Aeration Tanks w/ pure oxygen
  - Final Settling Tanks
  - Disinfection
- Solids Treatment Process
  - Gravity thickeners
  - Dewatering via BFPs
  - Drying
  - Lime Stabilization

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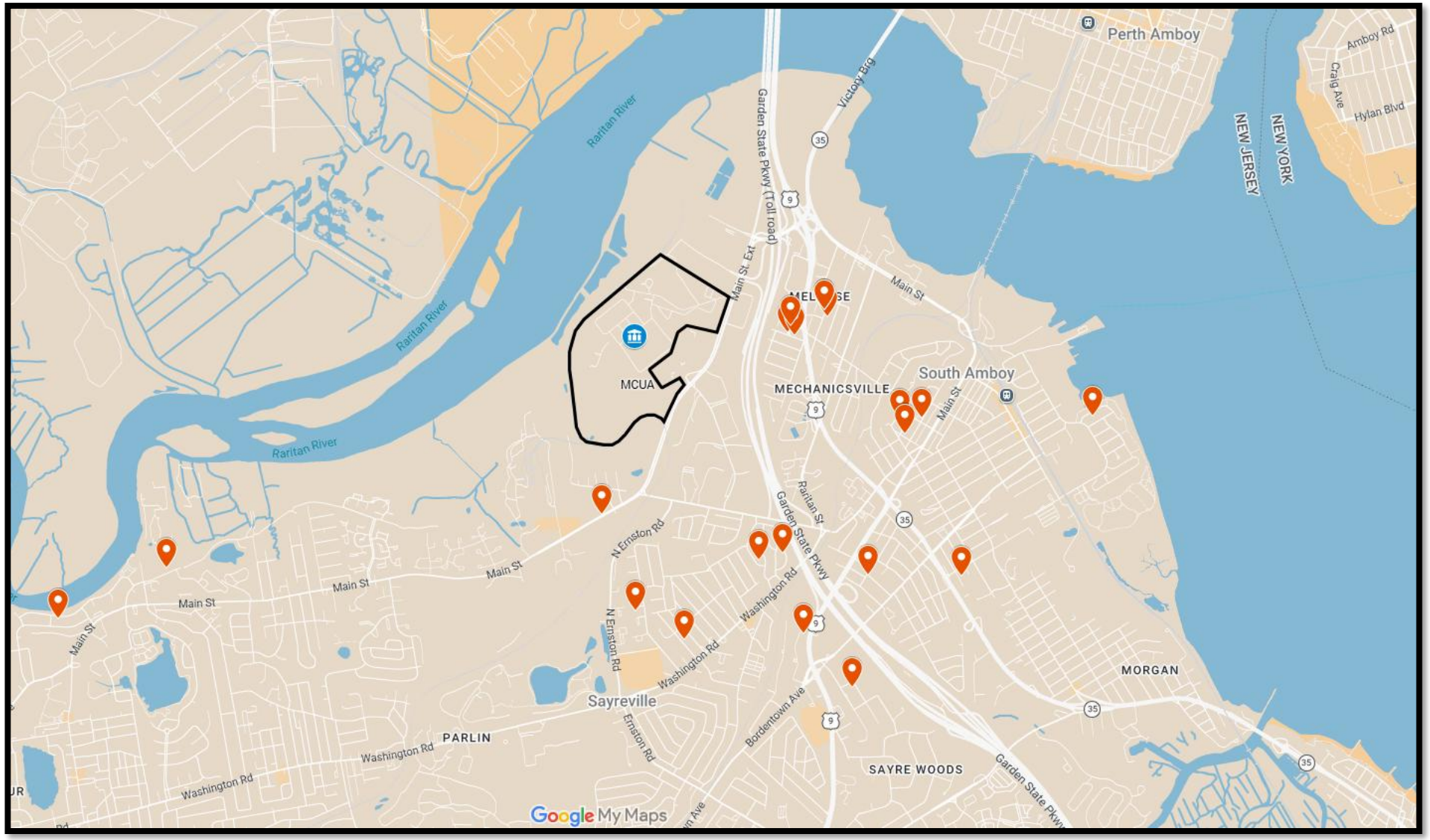
Odor Complaints 2023-2026



02 Odor Sampling and Monitoring

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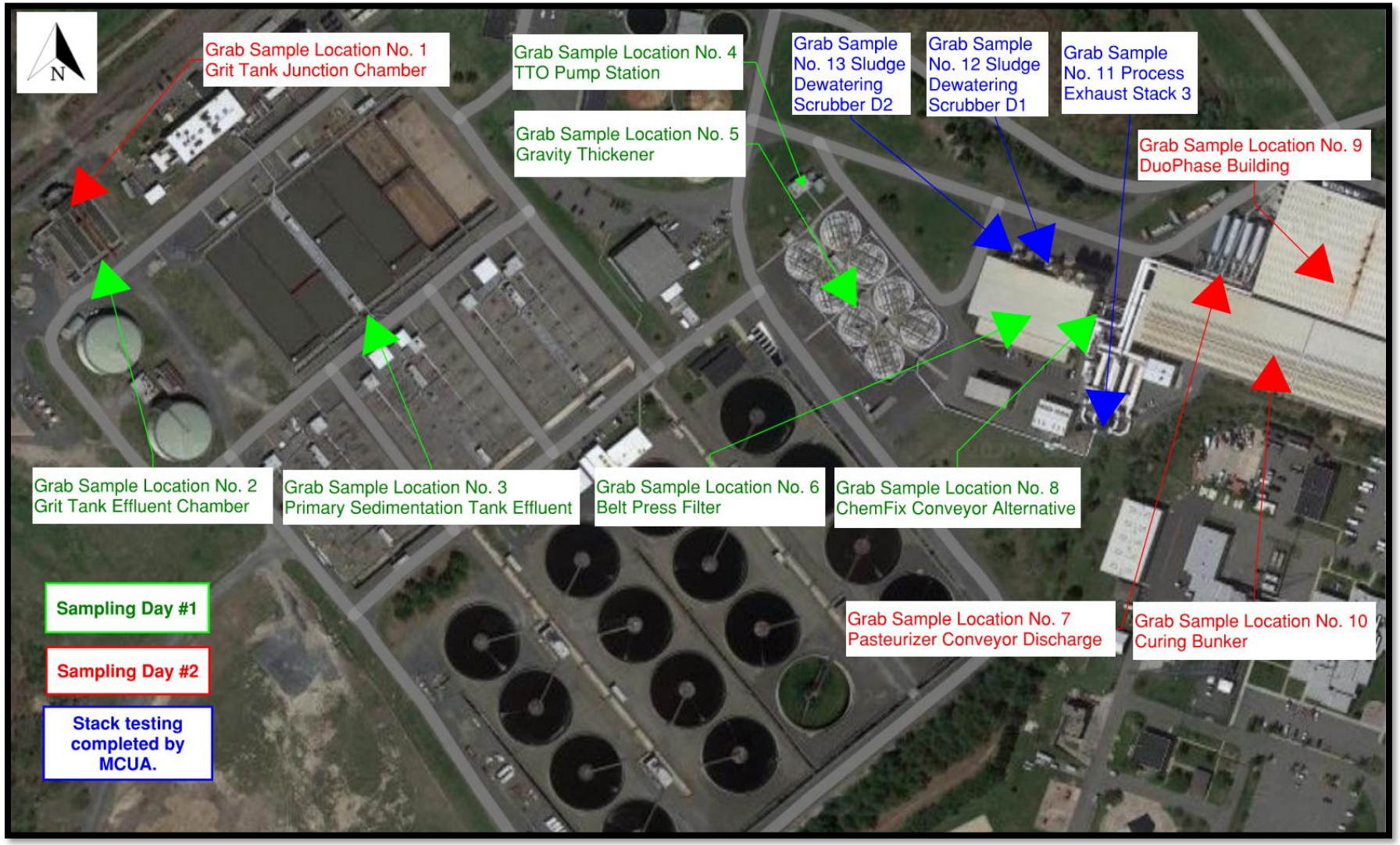
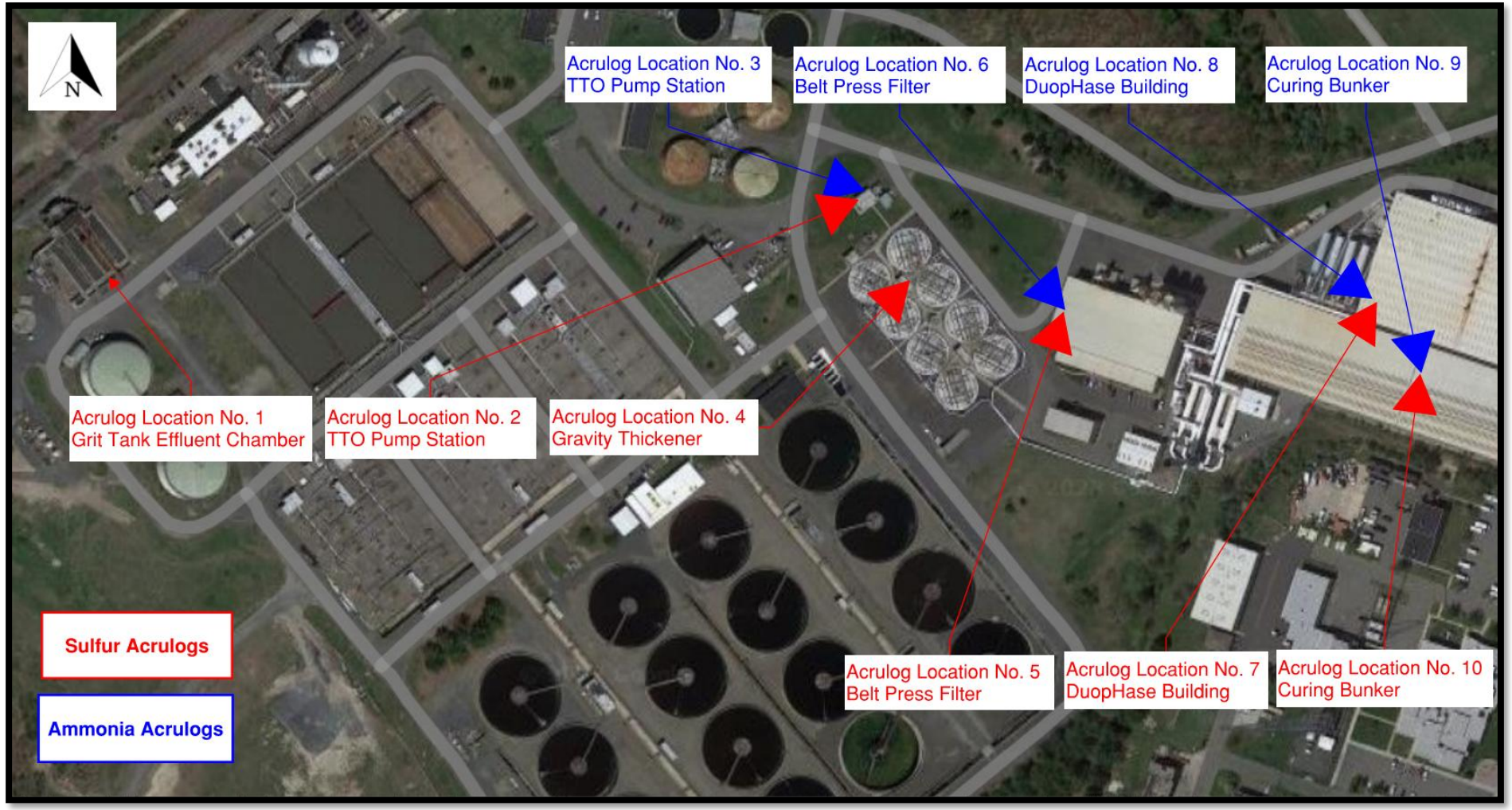
Sampling Locations



Sampling Results

No.	Location	Hydrogen Sulfide	Ammonia
		DT = 0.0047 ppm	DT = 5.0 ppm
1	Grit Tank Junction Chamber	0.048	0.002
2	Grit Tank Effluent	0.574	0.0006
3	Primary Sedimentation Tank	**2.872**	0.009
4	TTO Pump Station	**18.885**	0.074
5	Gravity Thickener	0.169	0
6	Belt Filter Press	0.877	0.163
7	Pasteurizer Conveyor	0.001	**6.601**
8	ChemFix Alternative	0.001	0.059
9	DuopHase Building	0.003	0.195
10	Curing Bunker	0.002	**2.027**
11	Process Exhaust Stack	0.045	0.0006
12	Odor Stack D1	0.102	0.005
13	Odor Stack D2	0.001	0

Acrulog Monitoring Location



Acrulog Monitoring Results

H2S Acrulog Monitoring		
	Average (ppm)	**Maximum (ppm)**
Grit Tank Effluent	2.83	79.6
TTO Pump Station	0	0
Gravity Thickener	0	0
Belt Filter Press	0.95	48.1
DuopHase Building	0	0
Curing Bunker	0	0

Ammonia Acrulog Monitoring		
	Average (ppm)	**Maximum (ppm)**
TTO Pump Station	0	0
Belt Filter Press	0	0
DuopHase Building	1.1	11
Curing Bunker	1.4	55

Identified Odor Sources for Dispersion Modeling

03 Dispersion Modeling

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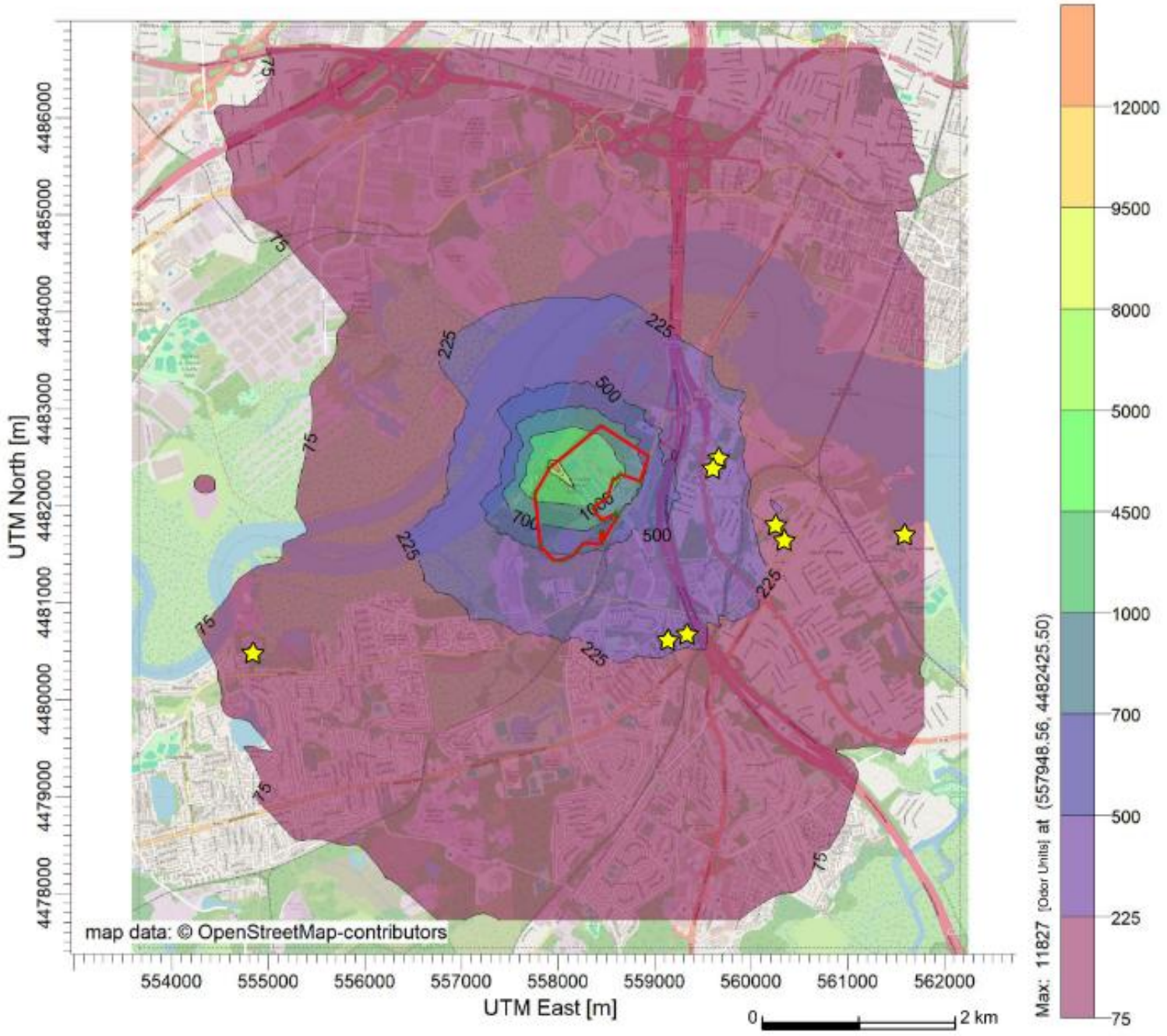
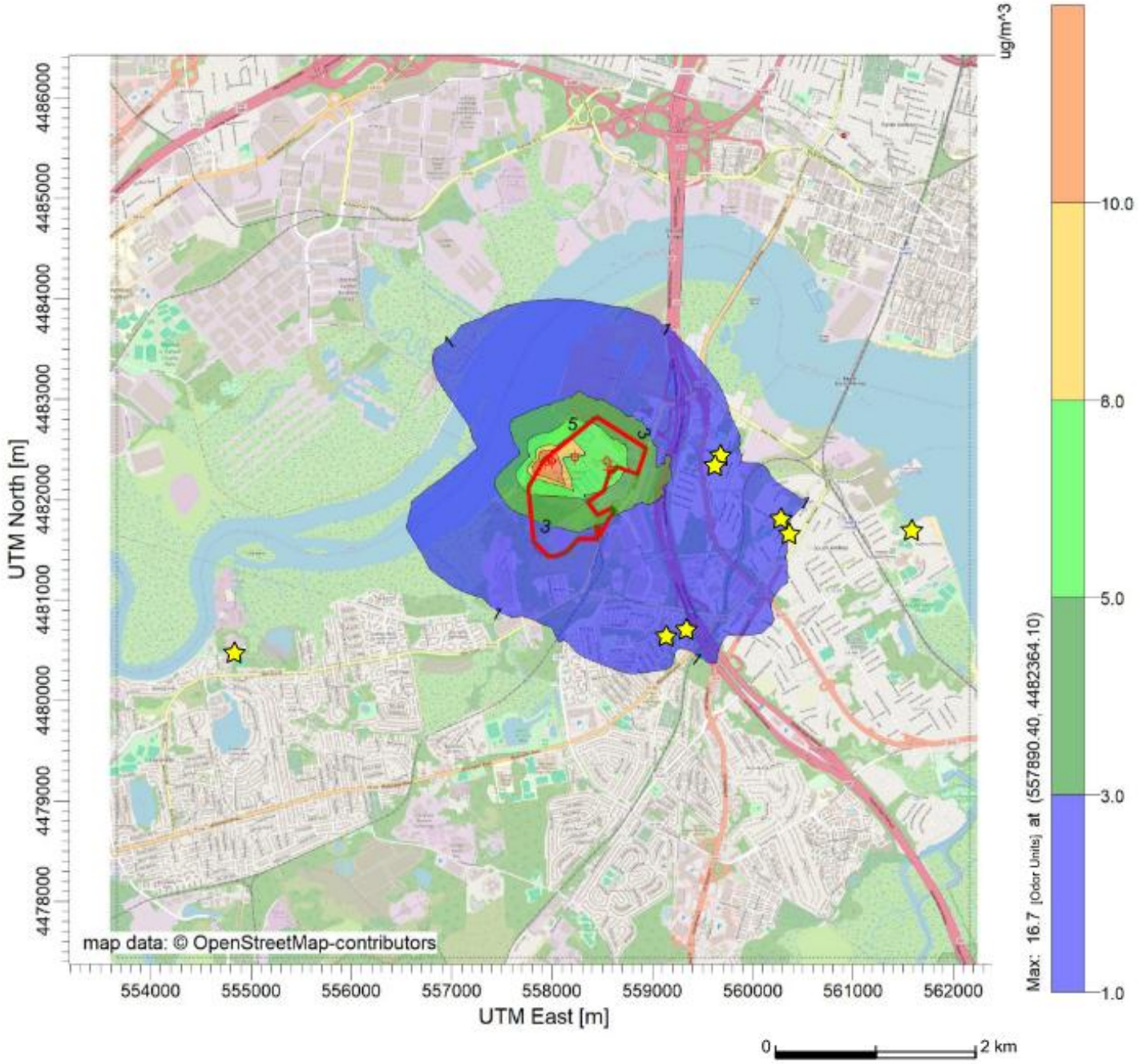
Dispersion Modeling · Baseline Conditions



Dispersion Modeling – Mitigation Condition



04 Odor Control Strategies

Best Management Practices

- Keep Gravity Thickener Tank covers closed.
- Adding sodium chlorite to gravity thickened sludge prior to dewatering.
- Keeping garage doors closed.
- As feasible, move biosolids material from DuopHase Building to Pasteurizers and Pasteurizers to Curing Bunker during evenings and nights.

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Best Management Practices

- Cleaning tanks that are emptied in a timely manner.
- Good housekeeping throughout plant to minimize scum and solids buildup in tanks.
- Adding Vanilla in the Mist, an enzymatic odor neutralizer and masking agent, onto truck beds and on top of loaded solids prior to tarping before trucks exit Curing Bunker.
- Continue routine switches of force mains approximately every 7 days to minimize odors that can occur if septic wastewater is introduced into grit chambers during force main changes.

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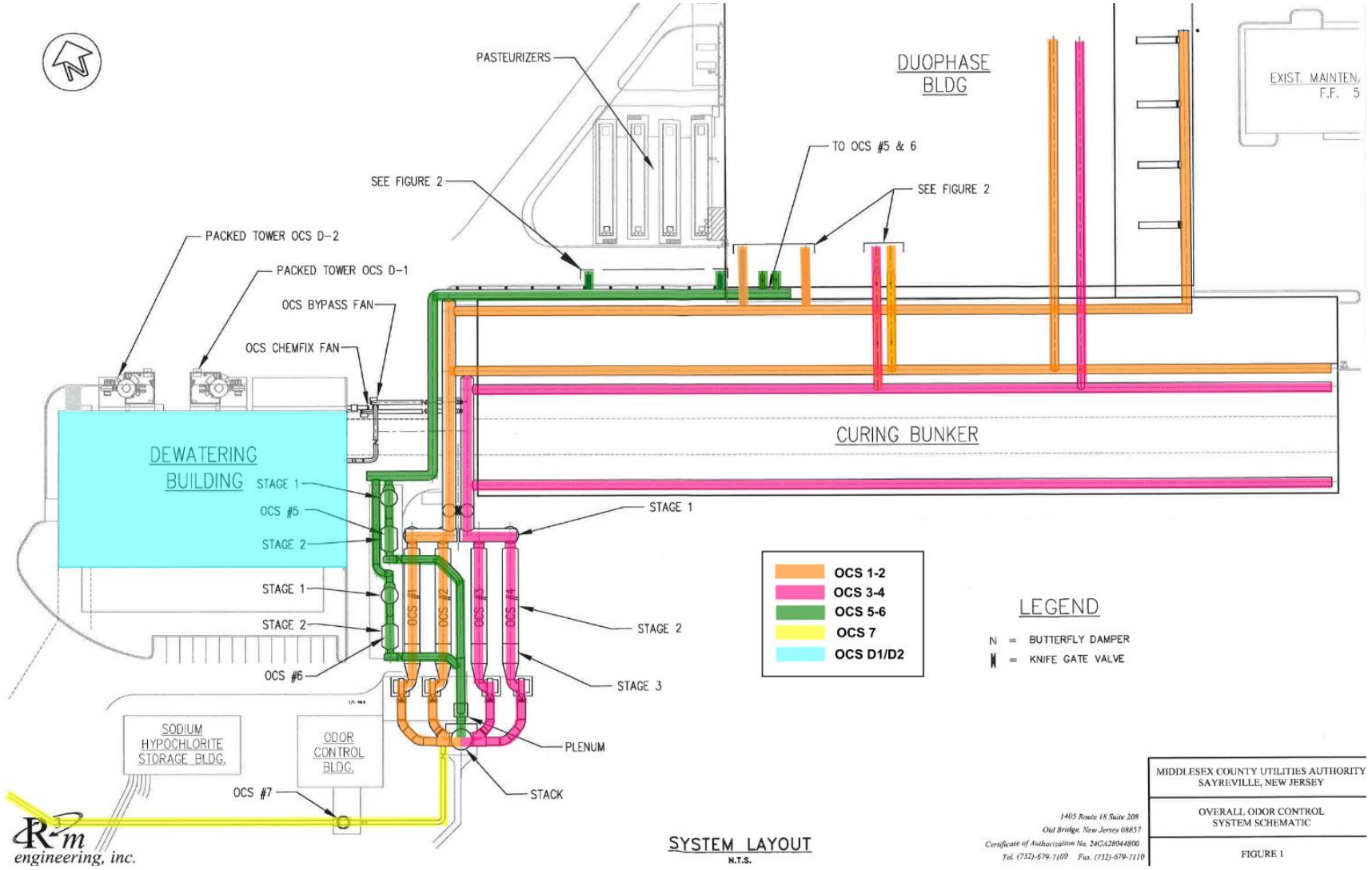
Existing Odor Control Systems



Existing Odor Control Systems

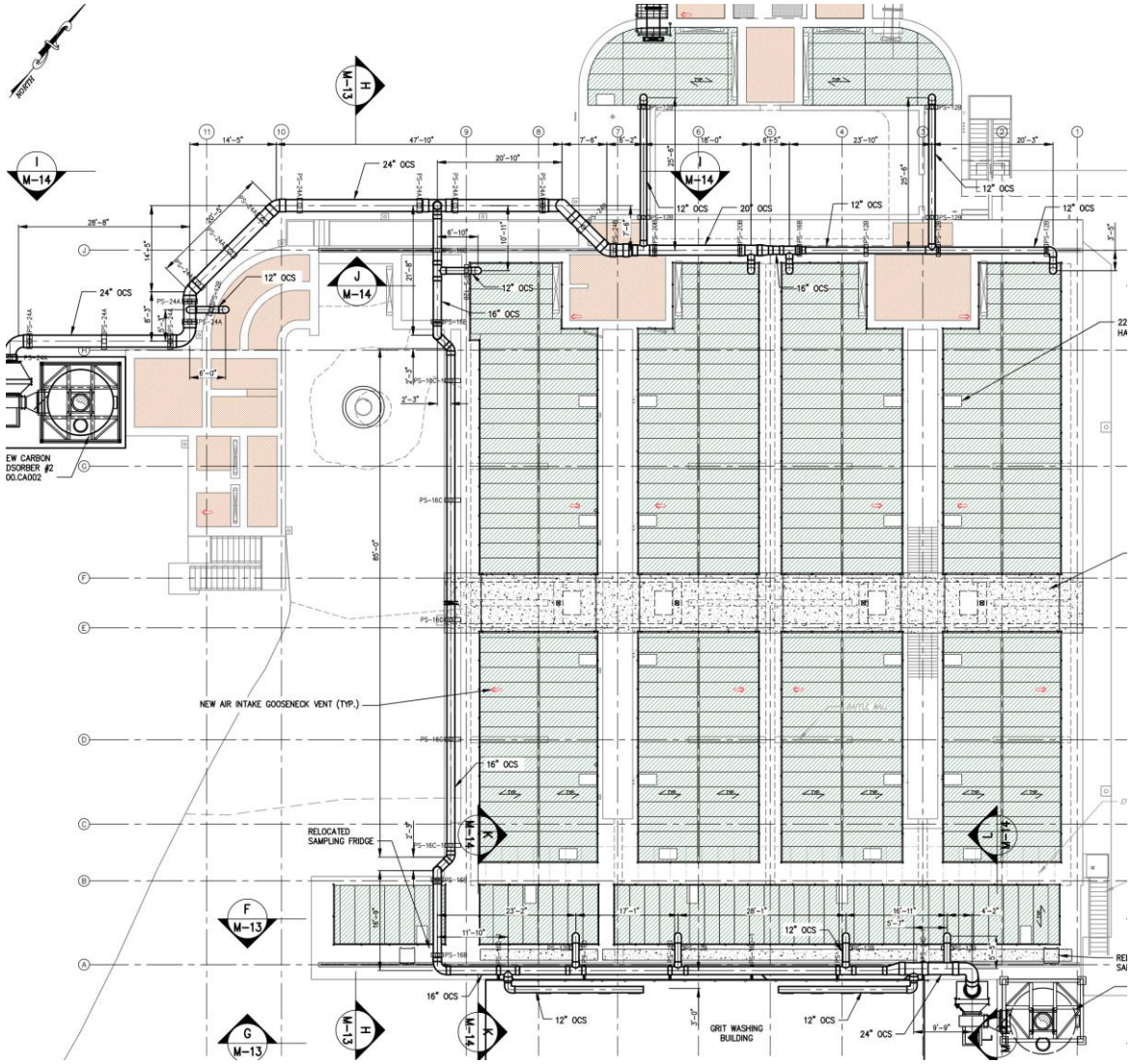
	OCS 1-4 Curing Bunker	OCS 5-6 DuopHase Building	OCS 7 Gravity Thickeners	Packed Tower OCS D1/D2 Dewatering Building
Stage 1	Sulfuric Acid 70-100% Removes ammonia and amines	Sulfuric Acid 93%	Sodium Hydroxide 15% Sodium Hypochlorite 25%	Sodium Hypochlorite 15% Sodium Hydroxide 25% Removes hydrogen sulfide
Stage 2	Sodium Hypochlorite 10-15% Removes hydrogen sulfide	Sodium Hypochlorite 15% Sodium Hydroxide 25%	n/a	n/a
Stage 3	Sodium Hydroxide 50%	n/a	n/a	n/a
Operations	At least 2 trains operating	At least 1 train operating	Can be turned off December 15-March 15	Both operating at all times, except for maintenance

05 New Odor Control System Evaluation

Odor Control Alternatives

- Grit Chambers
- Primary Sedimentation Tanks (PSTs)
- Combined PSTs and Grit Chambers
- TTO Pump Station
- Odor Control Technologies Evaluated:
  - Chemical Scrubbers
  - Granular Activated Carbon (GAC)
  - Biotrickling Filter with Mixed Media
  - Hybrid (Biological and Carbon) System

Grit Chamber Odor Control System



PST Odor Control System

Influent Channel (aerated)

Effluent Channel

Protective Coating

Combined PSTs and Grit Chambers
New Odor Control System Evaluation

Combined PSTs and Grit Chambers									
Evaluation Criteria	Weighting	GAC		Biological Filter w/ Engineered Media		Hybrid System		Chemical Scrubber	
		Score (1-4)	Weighted Score	Score (1-4)	Weighted Score	Score (1-4)	Weighted Score	Score (1-4)	Weighted Score
Total 20-Year Present Worth Costs	40	4	160	3	120	2	80	1	40
Odor Control System Reliability	60	2	120	3	180	4	240	1	60
Total	**100**	**--**	**280**	**--**	**300**	**--**	**320**	**--**	**100**

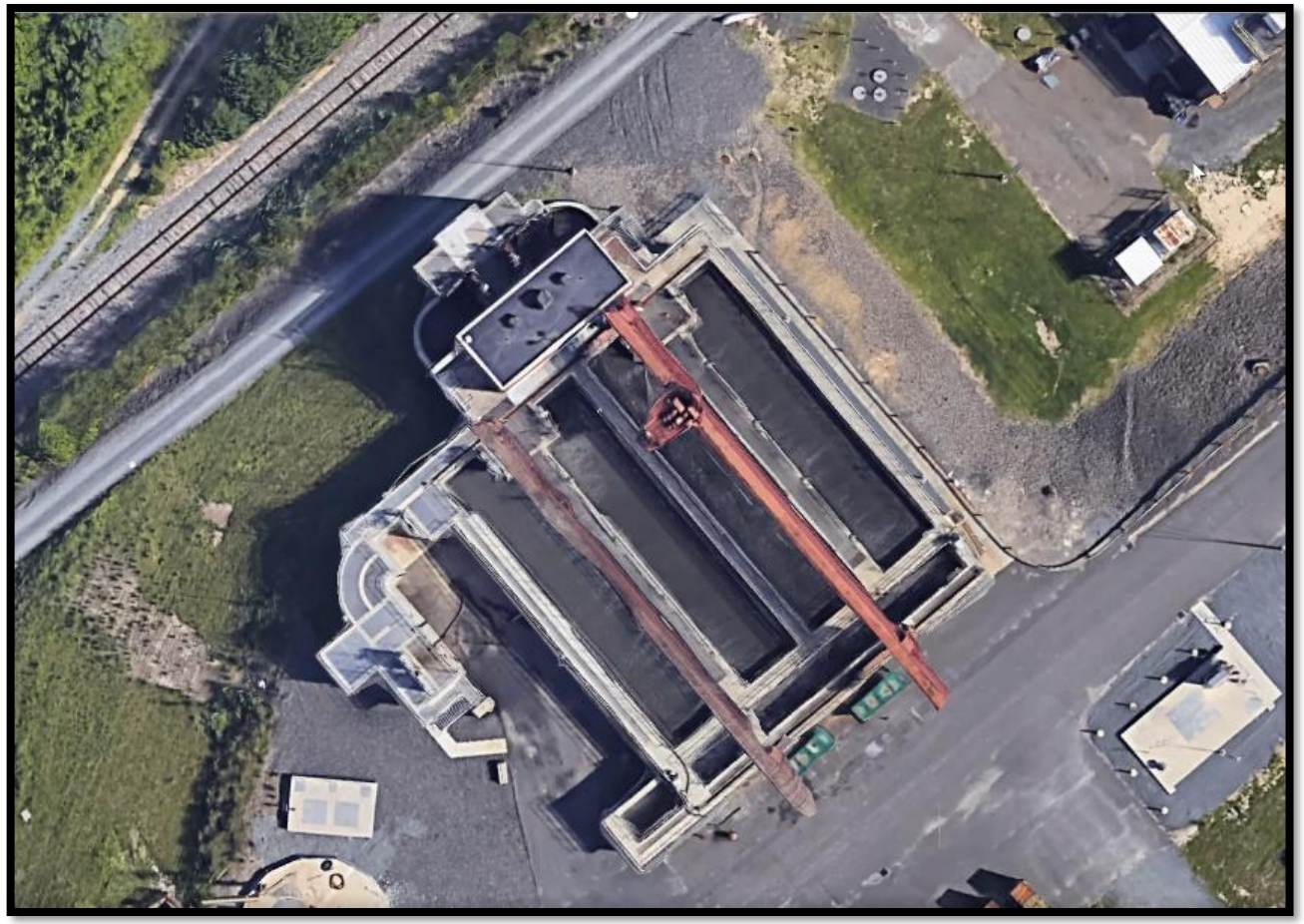
Scores: 1 = least favorable, 4 = most favorable

Odor Control System Recommendations

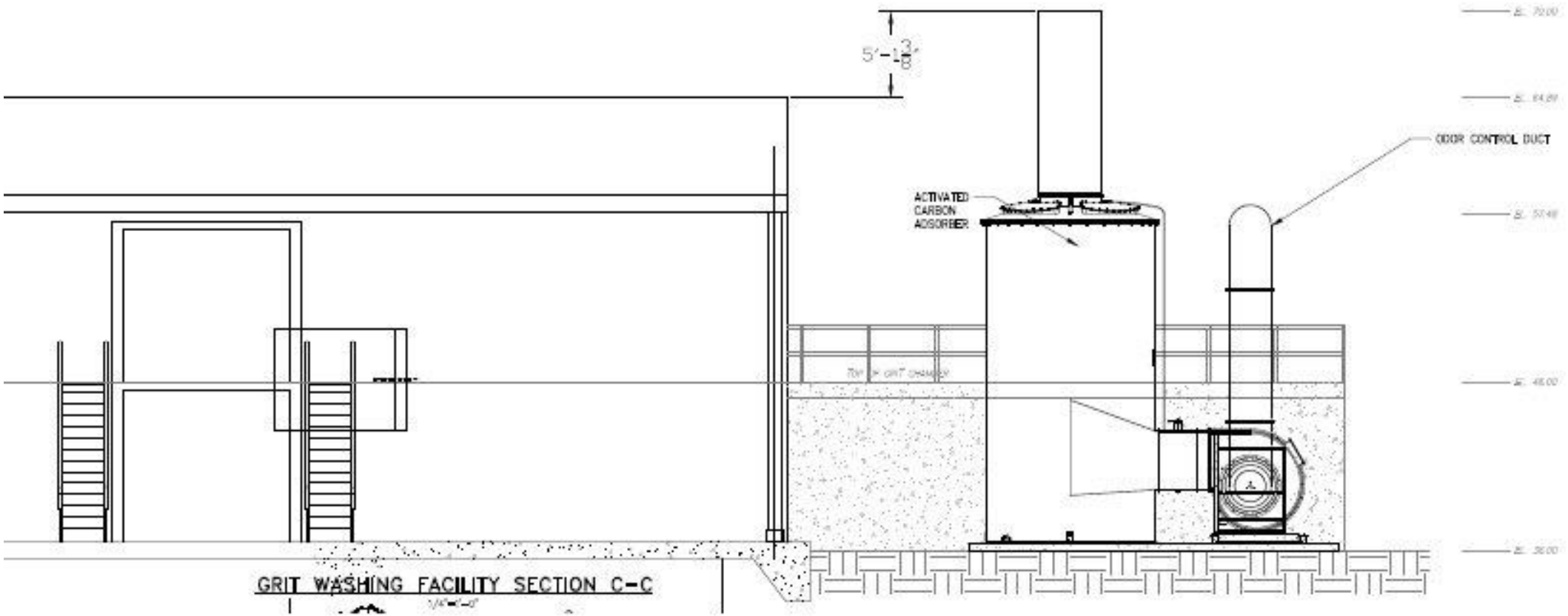
06 Current Updates

Aerated Grit Chamber Project

- Contract Awarded June 2025
- Project Includes:
  - Installation of chamber covers and new odor control unit
  - Replacement of grit removal system with continuous grit removal with grit washers
- Air from under the covers will be treated via a new V2 Carbon Adsorber Odor Control System, which will limit odors.
- The system is designed for an air flow rate of 11,000 cfm for continuous service.

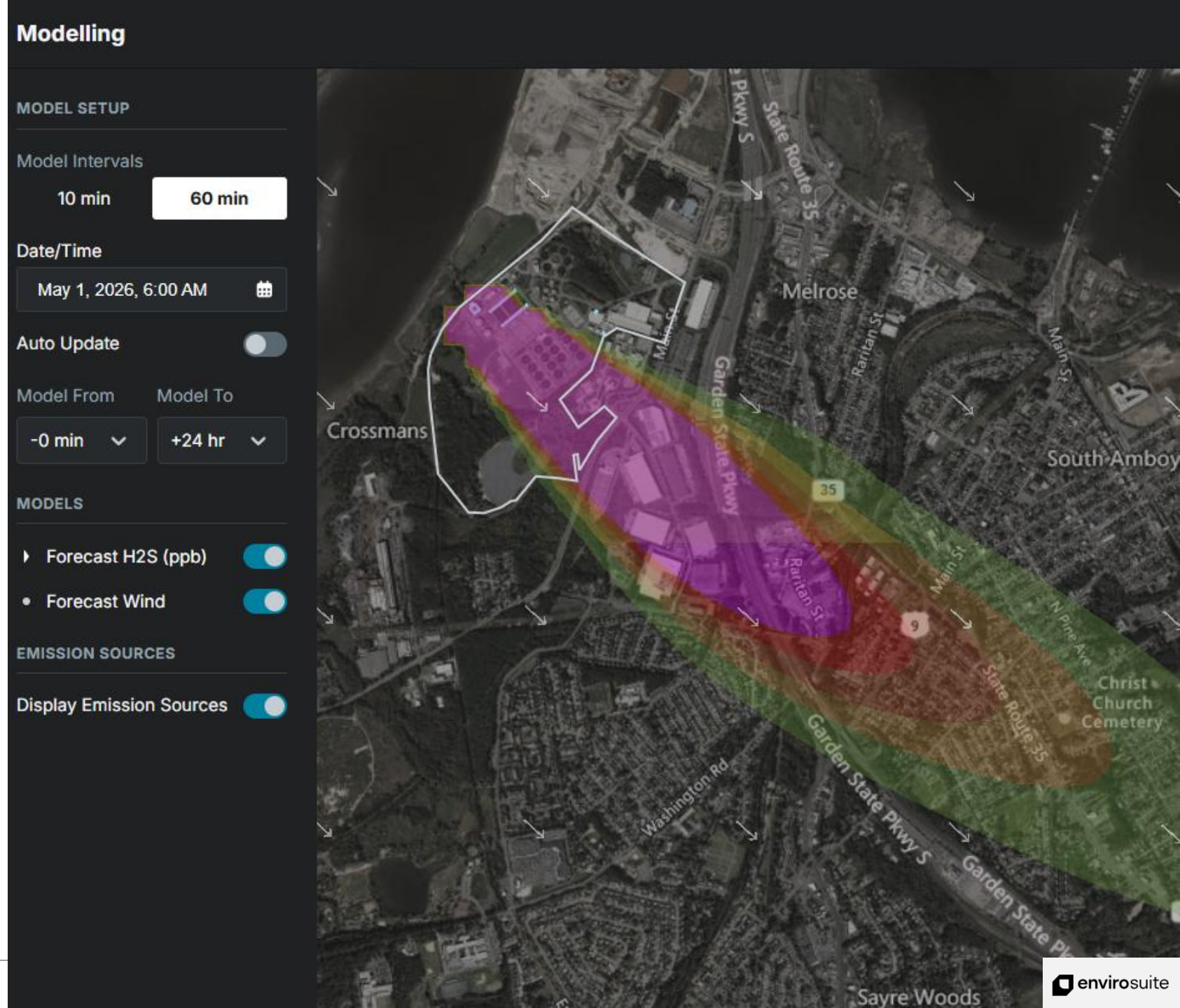


Aerated Grit Chamber Project



Envirosuite

- Installed in March 2026
- Two monitors along Main Street Extension measure:
  - Volatile Organic Compounds
  - Hydrogen Sulfide
  - Ammonia
- On-site weather station
- Allows for real-time validation of odor complaints
- Modelling application shows potential odor impacts to the community based on weather data



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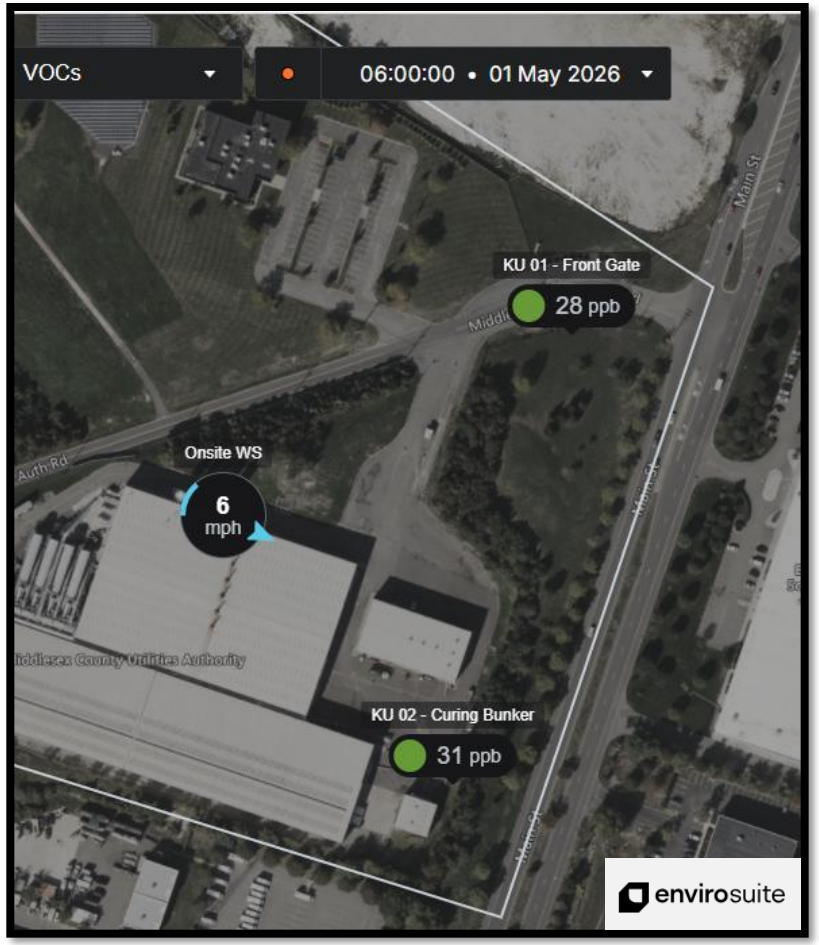
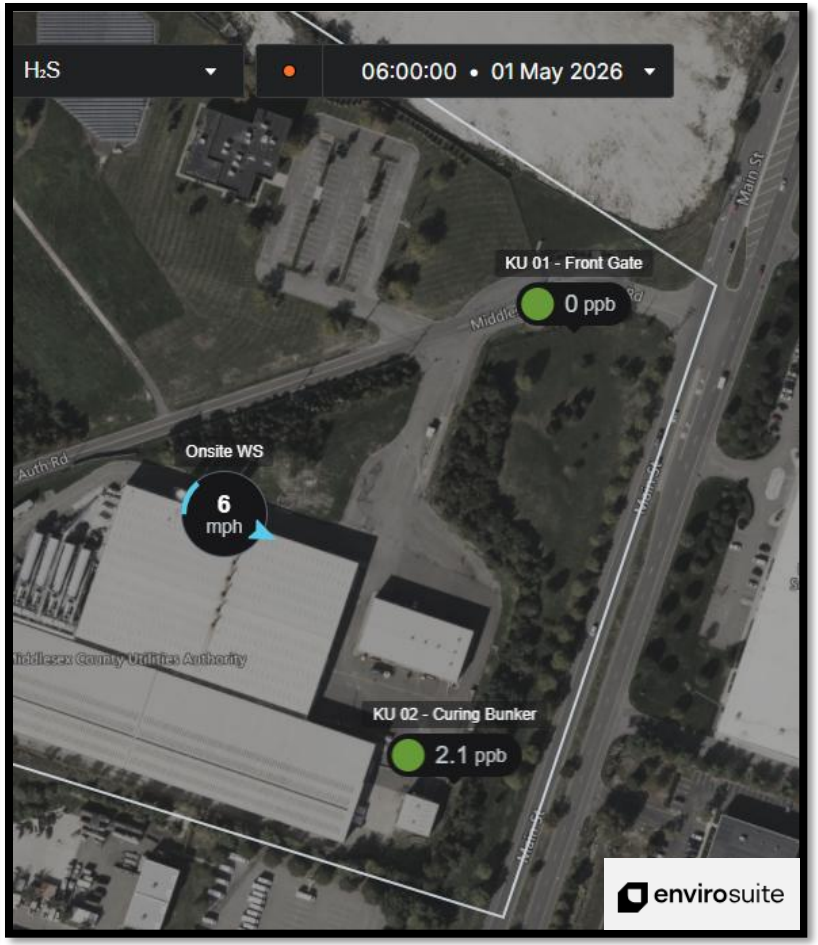
envirosuite

Envirosuite Monitors

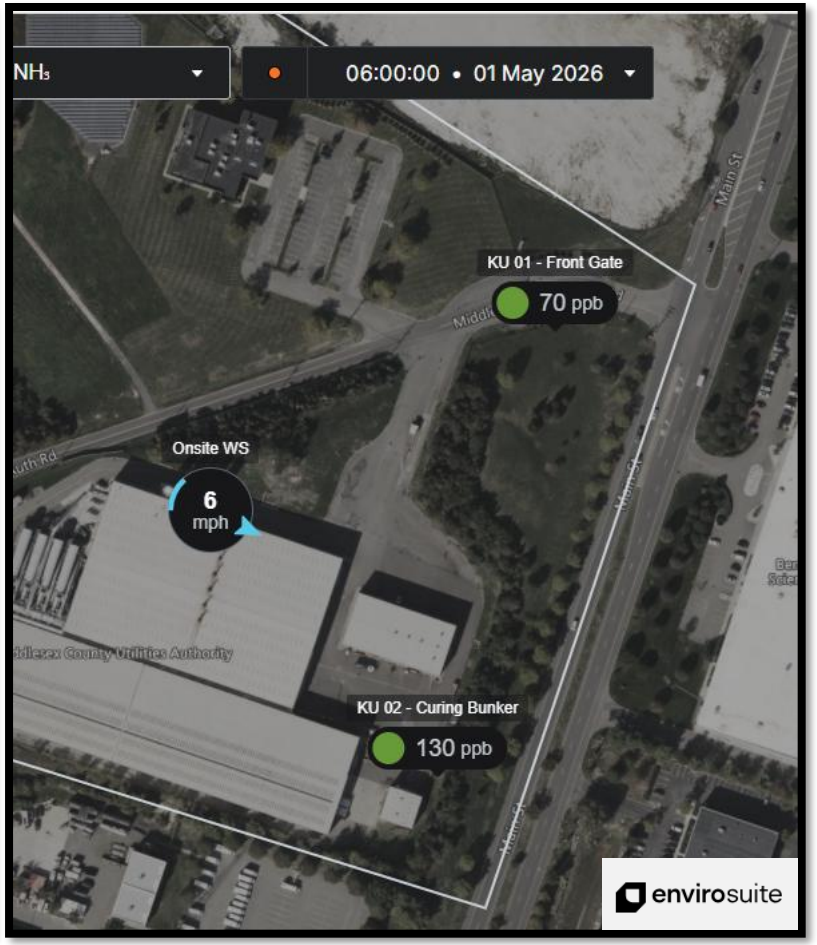
Volatile Organic Compounds



Hydrogen Sulfide



Ammonia



Biosolids Master Plan

- Odor Study of Biosolids Process Areas
  - Odor Control Sampling Plan developed
  - Sampling scheduled for end of month

- Odor survey to focus on:
  - Hydrogen Sulfide
  - Ammonia
  - Reduced Sulfer Compounds (RSCs)
  - Amines
  - VOCs
  - Odor (D/T)

- Better understand performance of individual OCS's
- Acrulog data to define durational patterns

Thank you and Questions?

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