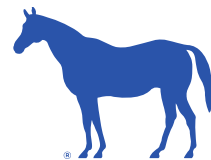# DIVISION OF WATER QUALITY ODOR CONTROL PLAN 2024

Environmental Quality & Public Works Committee

February 6, 2024

Charles H. Martin, P.E.

LEXINGTON

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AGENDA

- Sources of Odor Problems in Sanitary Sewers

- Overview of Current Odor Control Systems

- 2023 Escalation of Complaints / Response- Action Plan

- Questions

Sewer Odors: Sources and Reasons

- **Pipelines** - Long times of travel in an oxygen deficient situation, venting is a risk.

- **Air Release Valves** – design to emit trapped air pockets in pressurized pipelines.

- **Treatment Plants and Pump Stations** – concentrated points of collection and retention.

Distance & Time – sewage treated at either treatment plant travels as far as 7 miles from the flush point to the treatment point. Most sewers designed at 2 ft/sec velocity … time of travel 5 to 7 hours.

- **Weather**

  o Lack of rainfall reduces flow to minimum when system is designed for the maximum.

  o Fall seems to be the worst time because it's warm in the daytime / cool at night, result is temperature inversions that seem to trap odor at ground level.

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AGENDA

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Current Odor Control Strategies

- Treatment Plants and Class A Pumping Stations – point source treatment

- Collection System - remote chemical feed systems at structural pumping stations.

- Air Release Valves (ARVs)
  - designed to emit trapped air pockets in pressurized pipelines.
  - Site specific / location by location treatment.

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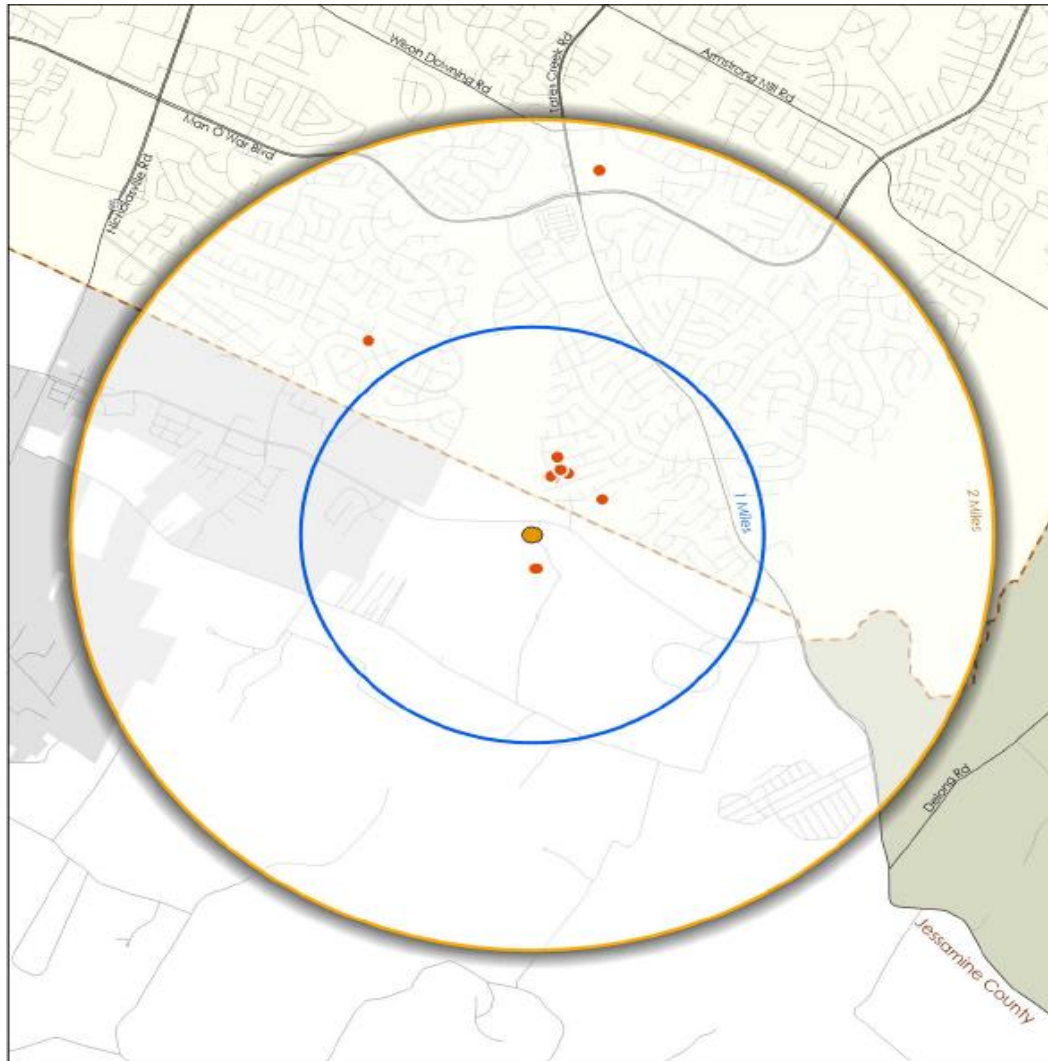
Odor Complaints by Treatment Plant
Town Branch Treatment Plant
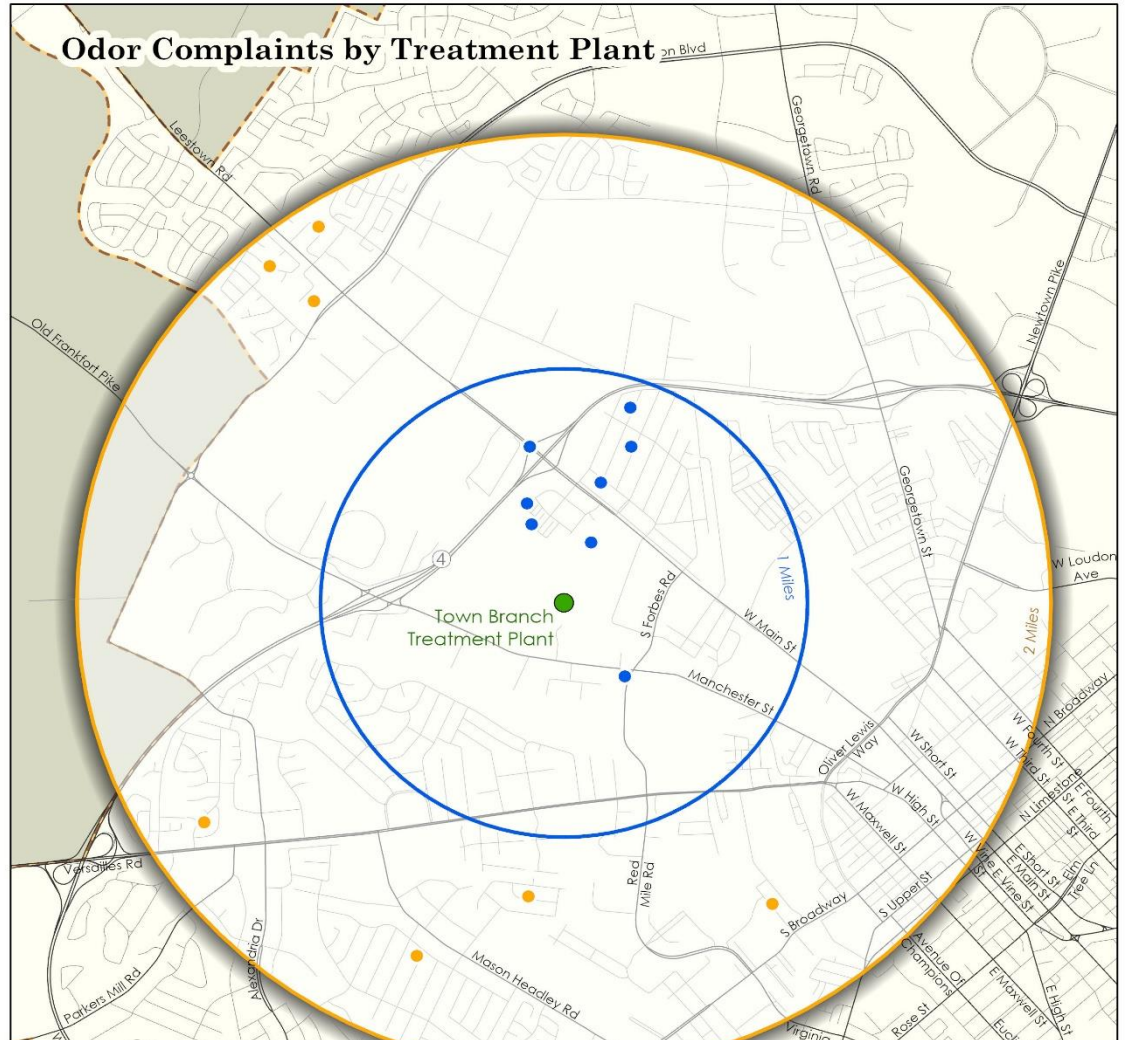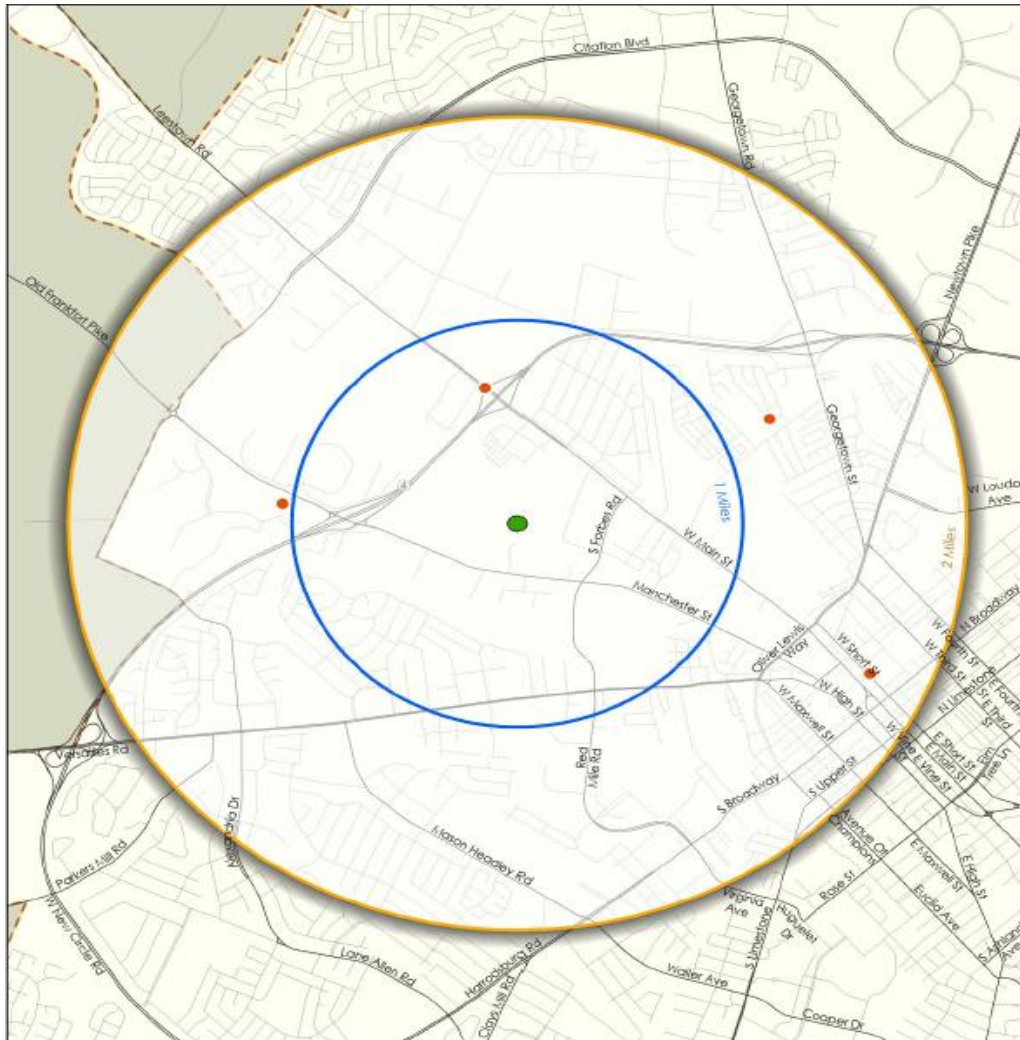
Call Totals by Distance
Within 1-mi: 1
Within 2-mi: 5
Calls received Jan 1, 2023 - Oct 20, 2023
LGUCG GIS

Odor Complaints by Treatment Plant

Town Branch Treatment Plant

Call Totals by Distance
Within 1-mi: 8
Within 2-mi: 7
Calls received Oct 1, 2023 - Dec 31, 2023
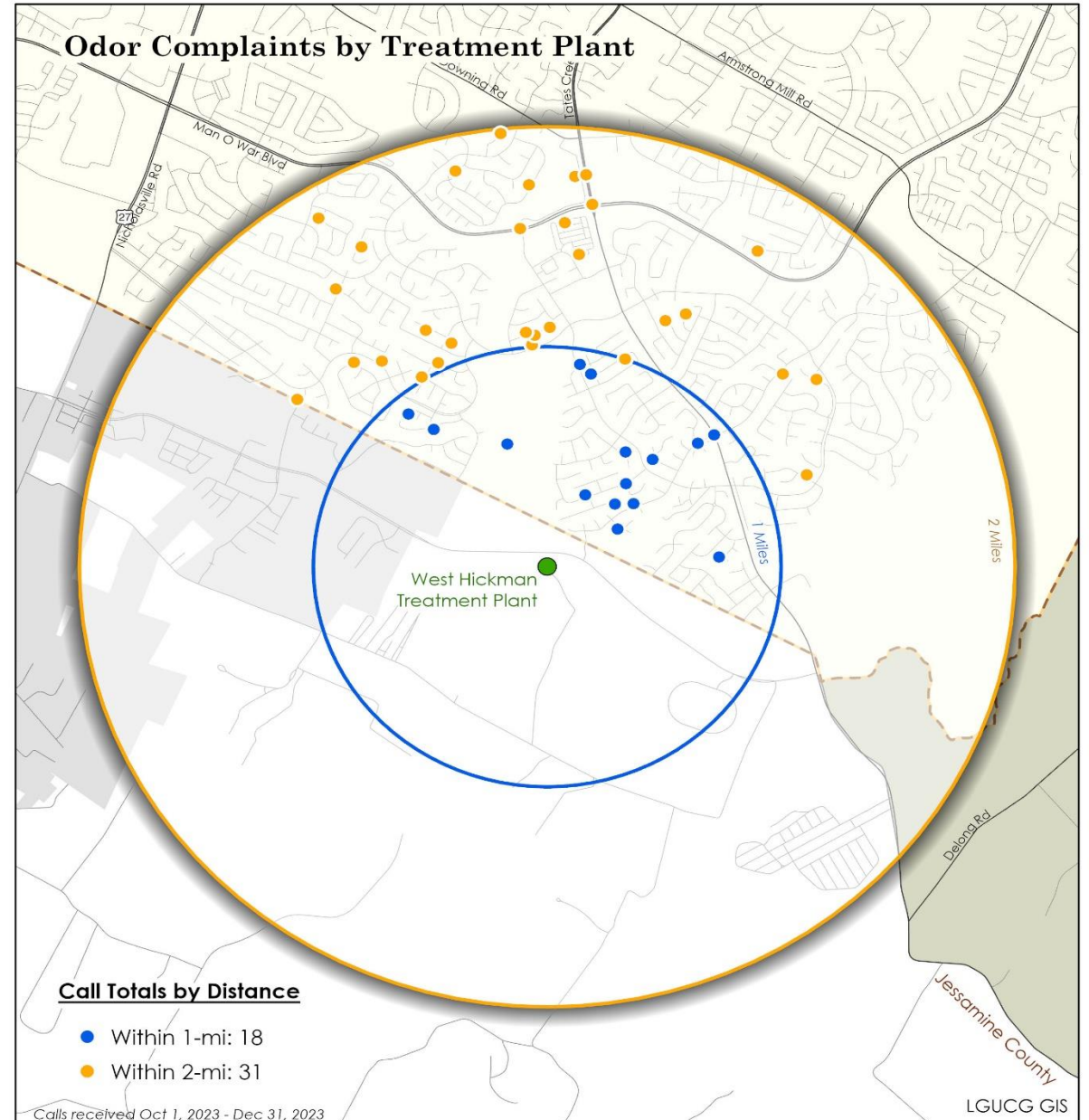LGUCG GIS

Odor Complaints by Treatment Plant

West Hickman Treatment Plant

Call Totals by Distance

Within 1-mi: 8

Within 2-mi: 2

Calls received Jan 1, 2023 - Oct 20, 2023

LGUCG GIS

Odor Complaints by Treatment Plant

West Hickman Treatment Plant

Call Totals by Distance

● Within 1-mi: 18

● Within 2-mi: 31

Calls received Oct 1, 2023 - Dec 31, 2023

LGUCG GIS

2023 to Present Odor Control Response
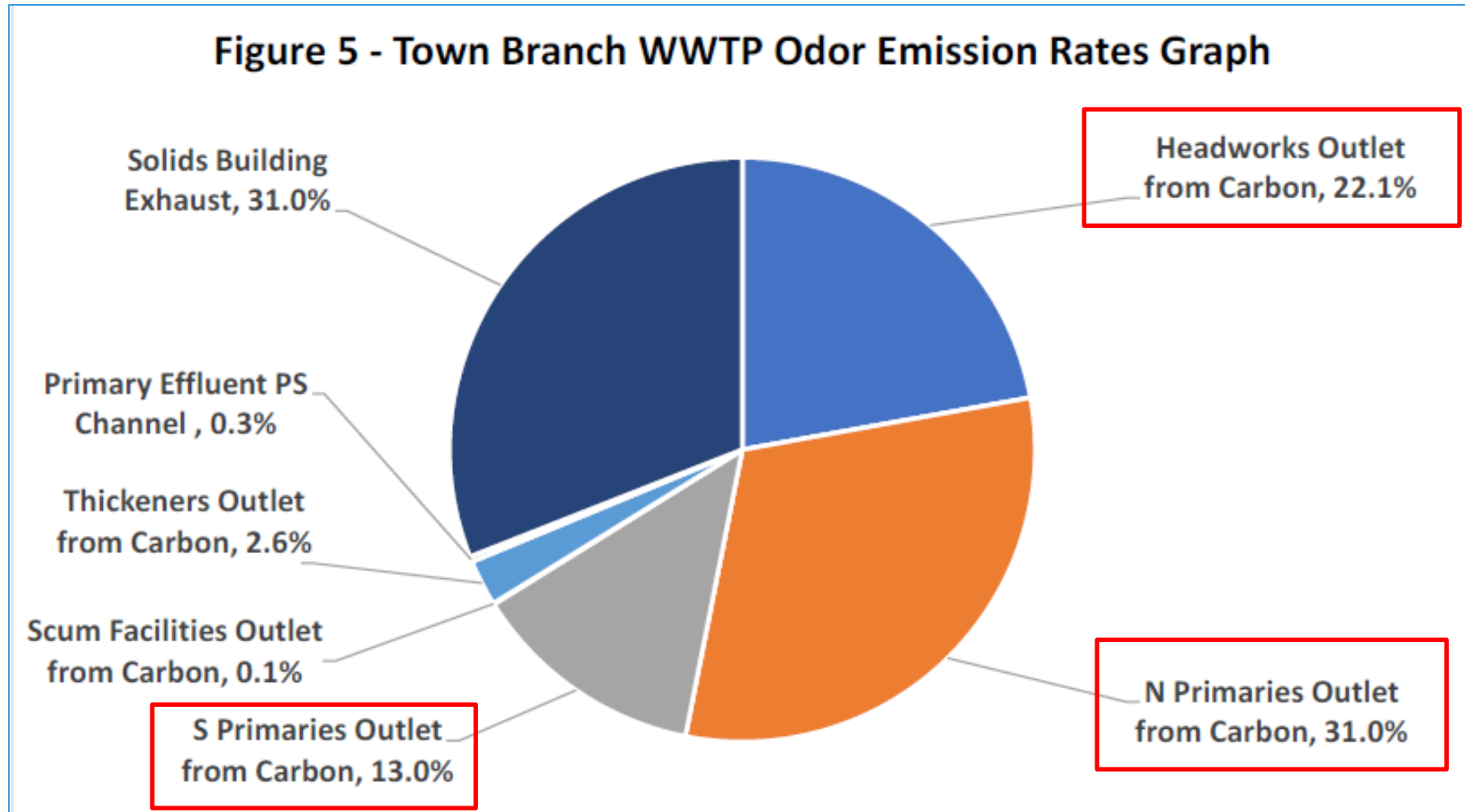
Treatment Plants

- Regenerated carbon unit at Town Branch north primary.

- Cleaned and rebalanced odor collection for West Hickman Headworks.

- Regenerated ASH tank scrubber at West Hickman.

- Created a unit price contract so that odor monitoring equipment can be installed at high-risk locations.

2023 to Present Odor Control Response
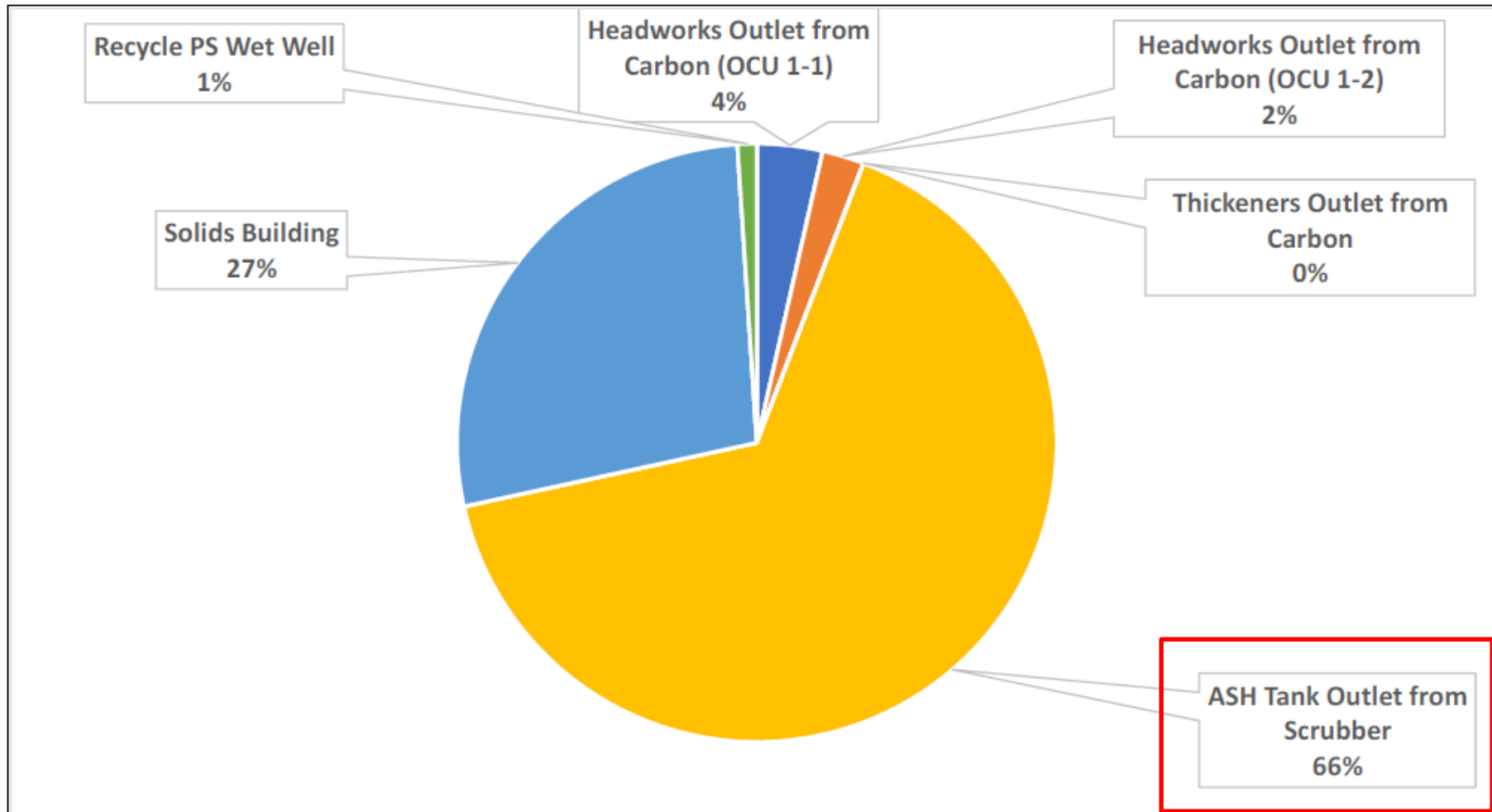
Treatment Plants

- Emergency purchase order issued by the Mayor to hire Webster Environmental Associates. Outcomes:

  o Conducted sampling for all high odor risk processes to fully assess current performance.

  o Provided recommendations on what equipment need upgraded soonest (best near results).

- Webster data will be used by the Program Management team to accelerate design and construction of improvements.

Webster Preliminary Findings

Figure 5 - Town Branch WWTP Odor Emission Rates Graph

- Solids Building Exhaust, 31.0%
- Headworks Outlet from Carbon, 22.1%
- Primary Effluent PS Channel, 0.3%
- Thickeners Outlet from Carbon, 2.6%
- Scum Facilities Outlet from Carbon, 0.1%
- S Primaries Outlet from Carbon, 13.0%
- N Primaries Outlet from Carbon, 31.0%

Webster Preliminary Findings

Figure 5 – West Hickman WWTP Odor Emission Rates Graph

2023 to Present Odor Control Response
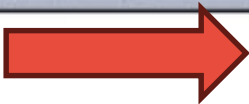
Collection System and ARVs

- Increased chemical feed rates at key locations.

- Engaged chemical supply vendor in launching a chemical feed optimization plan.

- Addressed deferred maintenance issues.

Chemical Optimization Preliminary Outcomes

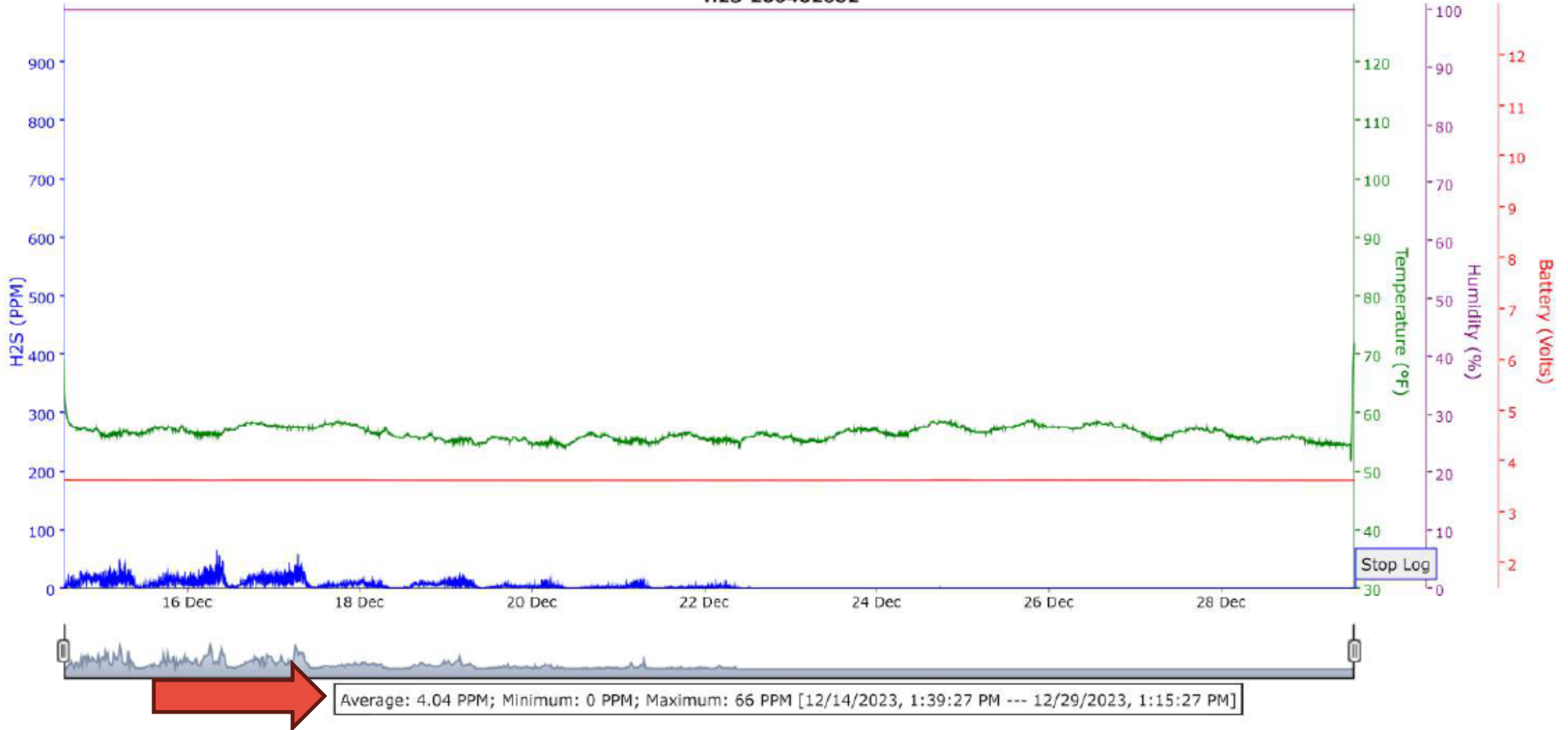H2S-200402682_9_12_2023, 1_46_14 PM --- 9_29_2023, 9_04_14 AM east hickman
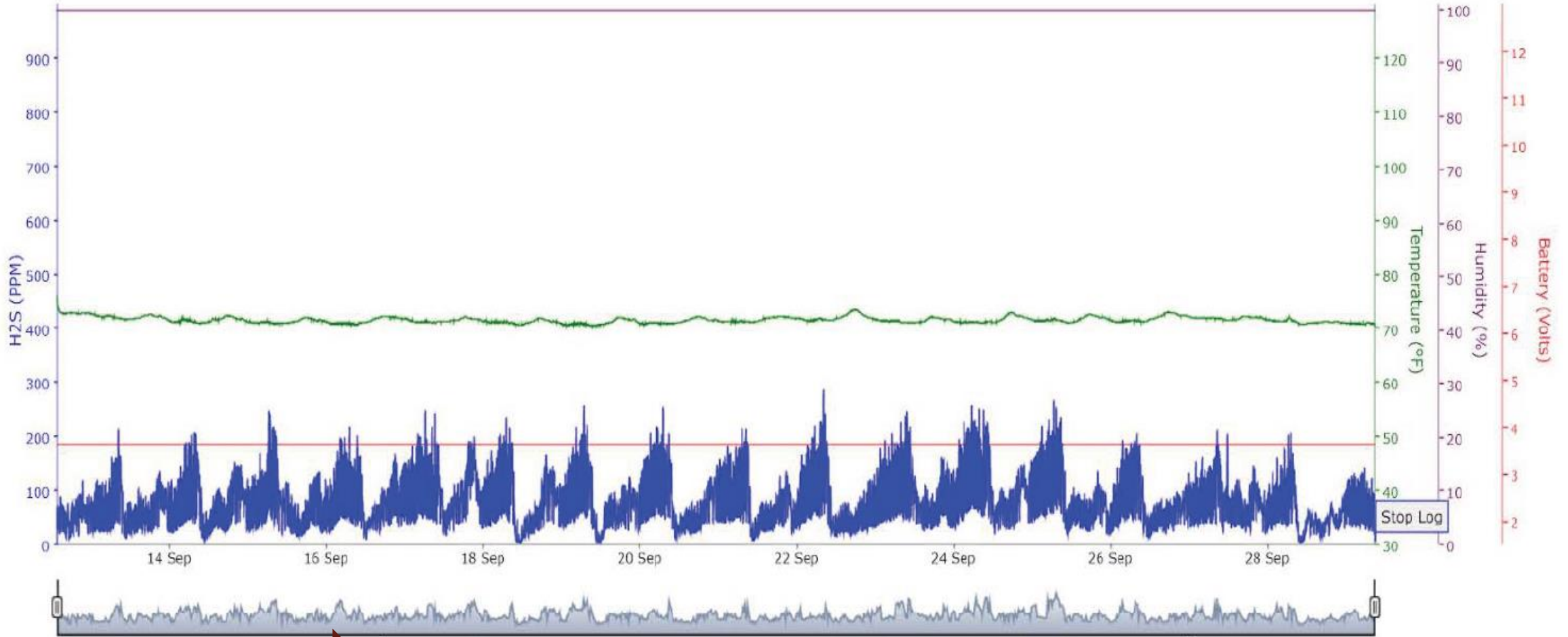
Average: 78.37 PPM; Minimum: 0 PPM; Maximum: 288 PPM [9/12/2023, 1:46:14 PM --- 9/29/2023, 9:04:14 AM]
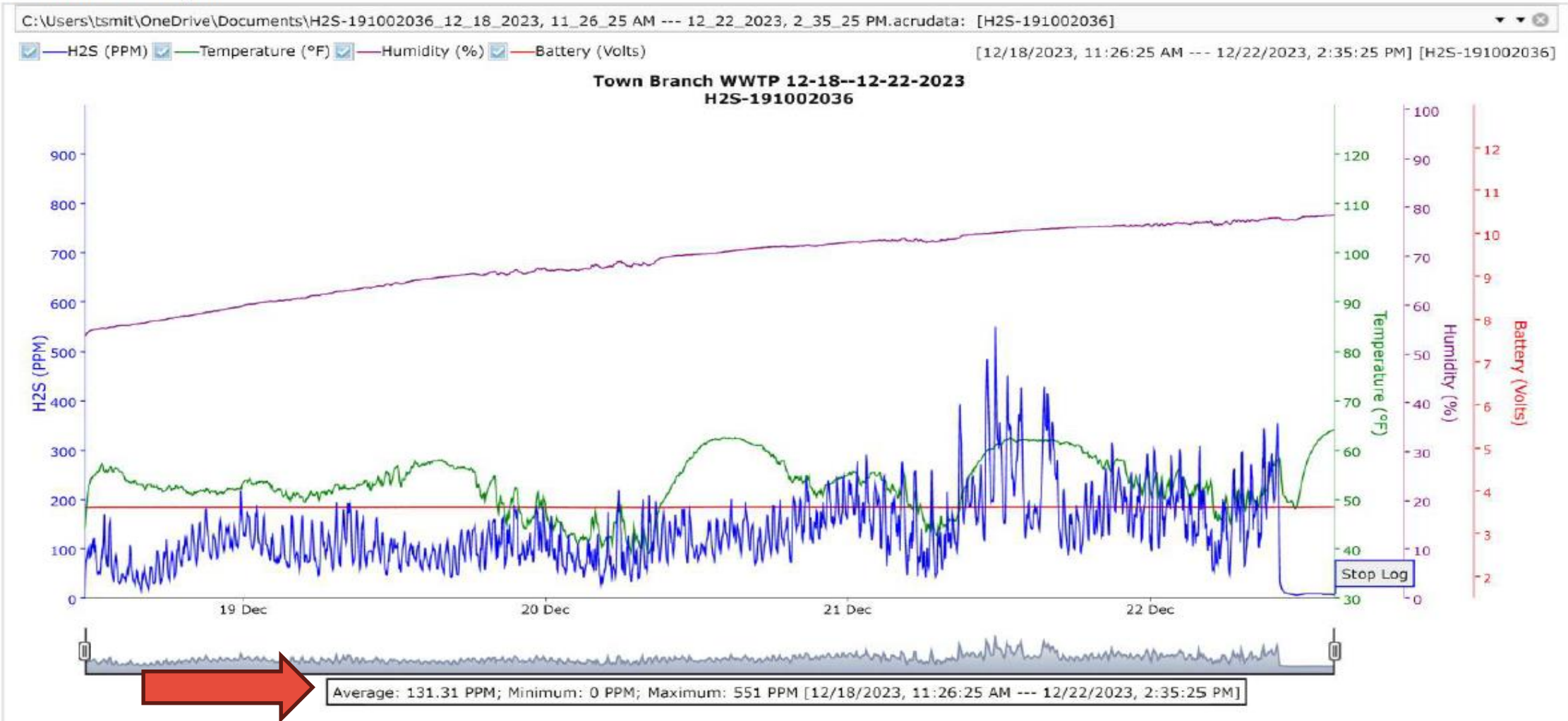
Chemical Optimization Preliminary Outcomes

East Hickman 12_14_--12_29_2023
H2S-200402682

Average: 4.04 PPM; Minimum: 0 PPM; Maximum: 66 PPM [12/14/2023, 1:39:27 PM --- 12/29/2023, 1:15:27 PM]

Chemical Optimization Preliminary Outcomes

Exhibit K-1 Graph:

Deferred Maintenance Preliminary Outcomes

Junction Chamber Behind Veterans Park Elementary

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Next Steps

Execute long-term contract with Odor Control Program Management team to:

- Design and construct the treatment plant equipment improvements highlighted in prior slides.

- Direct the optimization of chemical feeds (or other solutions) intended to:

  - Mitigate point source odors in the collection system, and
  - Limit odor loadings at the treatment plants

- Plan and execute collection system investigations, including smoke testing, to identify and correct indirect odor sources.

- Assist Water Quality in providing progress reports to interested parties.

QUESTIONS