January 3, 2025

Luke LeMond
Site Manager
Solid Waste Program
State of Washington Dept. of Ecology
Central Regional Office
1250 West Alder St.
Union Gap, WA 98903-0009

Re: DTG Yakima – Agreed Order No. DE 21624 – Monthly Progress Letter – December

Dear Mr. LeMond:

In accordance with Section 7.3 of Agreed Order (AO) No. DE 21624, the following is a description of the actions taken during December 2024 to implement the requirements of this AO.

Activities:
On-site activities included weekly gas probe and every other week ambient monitoring (except for the week of Thanksgiving). The once per month regulatory review meeting was held on December 19, 2024. The monitoring data summary through December 2024 from Landfill Fire Control, Inc. (LFCI) is attached.

Quarterly landfill gas monitoring was performed on December 4, 2024 and submitted to Ecology on December 10, 2024. The results included no actionable methane levels.

Third party hydrogen sulfide ambient monitoring was performed on December 4, 2024 and submitted to Ecology on December 10, 2024. No hydrogen sulfide was found in ambient air.

DTG submitted the Q3 groundwater monitoring report to Ecology on December 10, 2024.

DTG submitted the technical memorandum on the Q3 PFAS groundwater monitoring results to Ecology on December 10, 2024.

Parametrix performed Q4 groundwater monitoring during the week of December 9, 2024.

Parametrix perform Phase 2 Leachate Evaporation Pond sampling on December 30, 2024.

DTG received Ecology comments on the LRI Work Plan on December 5, 2025.

Deviations from Plans (if any):
None.

Deviations Description from the Scope of Work and Schedule:
None.

Address
22745 29th Dr. SE, Ste 200,
Bothell, WA 98021

Contact
425 549 3000
dtgrecycle.com

All Data Received or Collected:
Ambient and gas probe data for gases and temperature were emailed, separately, to Ecology weekly after measurements were taken. Gas probe data was entered into the tracking spreadsheets and assessed by LFCI. The summary of the data has been included as an attachment.

Third-party Q4 landfill gas and Q3 groundwater monitoring results were submitted to Ecology.

Deliverables for the Upcoming Month:
Deliverables will include:

- Weekly ambient and gas probe data
- January Progress Report
- Q4 groundwater report
- Hydraulic Testing Memorandum
- Final LRI Work Plan

Please contact me to discuss any of the above items.

Respectfully,

Ian Sutton
Director of Engineering
DTG Recycle
isutton@dtgrecycle.com

Enclosures: LFCI Data Update – December 2024

cc: mbrady@parametrix.com
steven.newchurch@co.yakima.wa.us

January 3rd, 2025 LFCIPRJ-2023-001

Mr. Ian Sutton, Director of Engineering
DTG Recycle
P.O. Box 14302 Mill Creek, WA 98082

By email: isutton@dtgrecycle.com

Re: Monthly Data Assessment Report DTG Yakima Landfill Fire Incident – December 2024

Dear Mr. Sutton,

LFCI has prepared a monthly review and update of gas and temperature monitoring data that is being collected at the DTG Recycle Landfill Fire in Yakima, Washington. The update includes maps showing the spatial distribution of temperature, carbon monoxide, and oxygen within the monitoring area and presents the data collected, highlighting trends and interpreting the results.

At the beginning of December, LFCI noted a large positive pressure swing that is believed to have forced air into the landfill and caused the subsurface fire activity to briefly flare up. Continuous monitoring throughout the holiday period has shown that this flare-up has now decreased to previous levels and the fire continues to respond positively to the oxygen suppression work.

Considering the available data, the oxygen suppression is working, but the fire suppression response is slow on account of low biological activity within the landfill. Nevertheless, the highest observed temperatures at GP-3 are once again declining at a steady rate. Other temperatures continue to decline or remain low throughout the hotspot area. Without additional intervention, extinguishment temperature of less than 180 F is expected to be reached in 3 to 6 months if current trends continue.

The landfill gas composition data is also indicating that the subsurface smolder is becoming less and less active with CO, H2, VOC's and H2S all trending downward. The uptick in VOC's noted in September and the beginning of December has decreased as expected. Uncorrected, Carbon Monoxide levels have significantly decreased from previous levels, down to approximately 4,000ppm compared to previous 10,000ppm levels. Given the high H2 levels that are known to cause cross sensitivity issues on CO, when the latest CO readings are corrected for H2 concentration, the results indicate a current CO concentration of 2,000 and trending downward. Per LFCI's fire control plan, monitoring can be reduced to once every two weeks once CO levels drop below 500 ppm and the fire can be declared extinguished CO concentration is below 200 ppm. Based on the latest graph LFCI is projecting that this level will be reached in about 3 months, but could be longer on account of residual background gas in the pore space.

Plotting of the temperature data in plan view clearly shows that the area affected by fire has markedly decreased over time. Based on the available data, LFCI believes that a small smolder continues to be active near GP-3, and that the rate of combustion of the smolder is steadily decreasing, however slowly. Based on the extinguishment target of temperature dropping below 180°F, we currently project that the fire will be declared extinguished in 8 months based on trends in T-1 and 5 months based on trends in GP-3.

Based on this, LFCI recommends that monitoring continue on a weekly basis until it can be shown that CO levels in all locations have decreased to below 500ppm, once corrected for cross sensitivity effects. At that time, monitoring can be decreased for prevention purposes. Given the recent response and the reduced time line now projected to extinguishment, LFCI is of the opinion that further intervention is not warranted at this time.

We trust that this report provides the information you require, and should you need anything else please don't hesitate to contact the undersigned.

Sincerely,

LANDFILL FIRE CONTROL INC.

Dr. Tony Sperling, P.Eng.
President

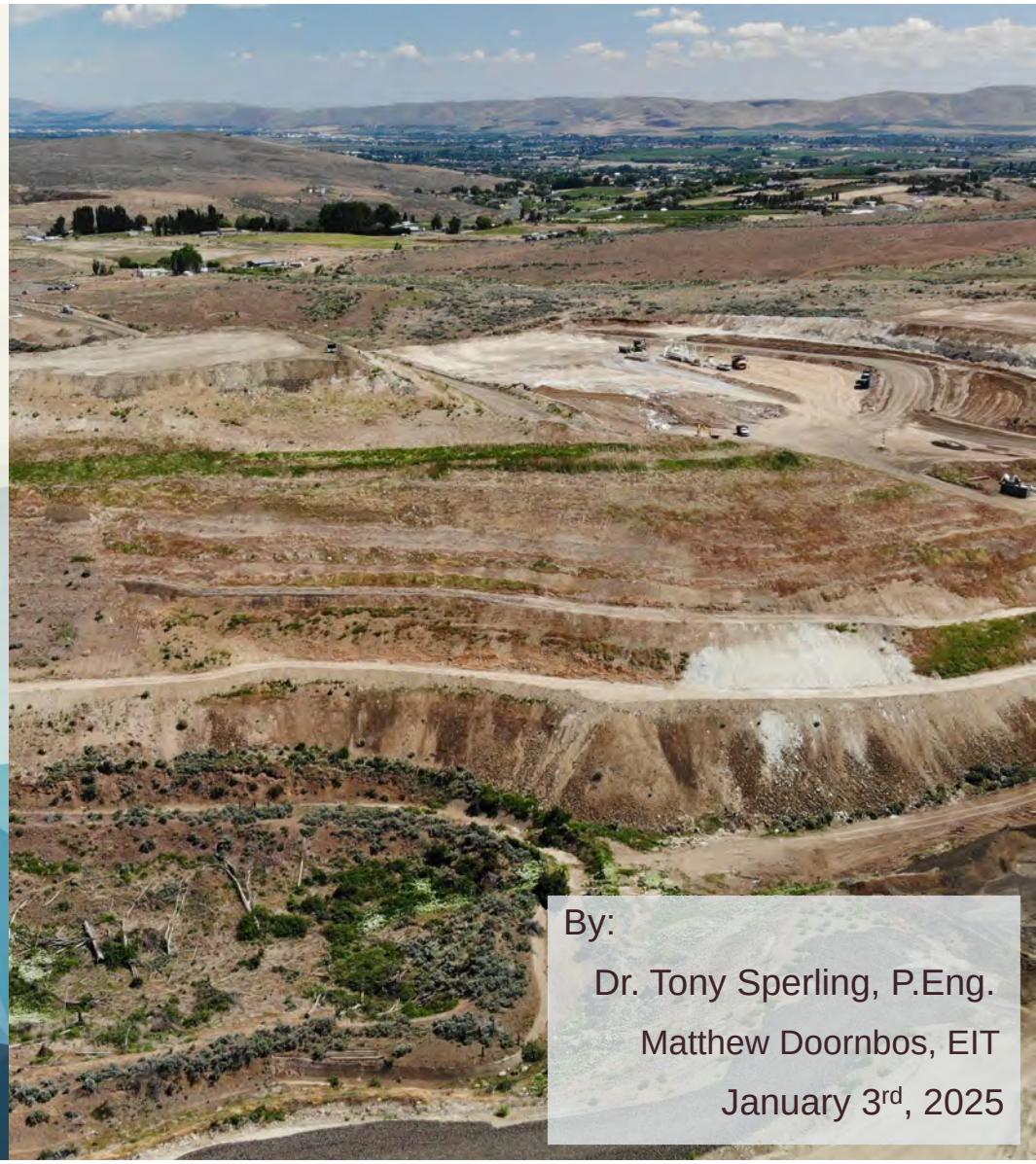
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. SPERLING

January 3rd, 2025

DTG LPL LANDFILL FIRE INVESTIGATIONS AND MITIGATION

Monthly Monitoring Data Review

December 2024



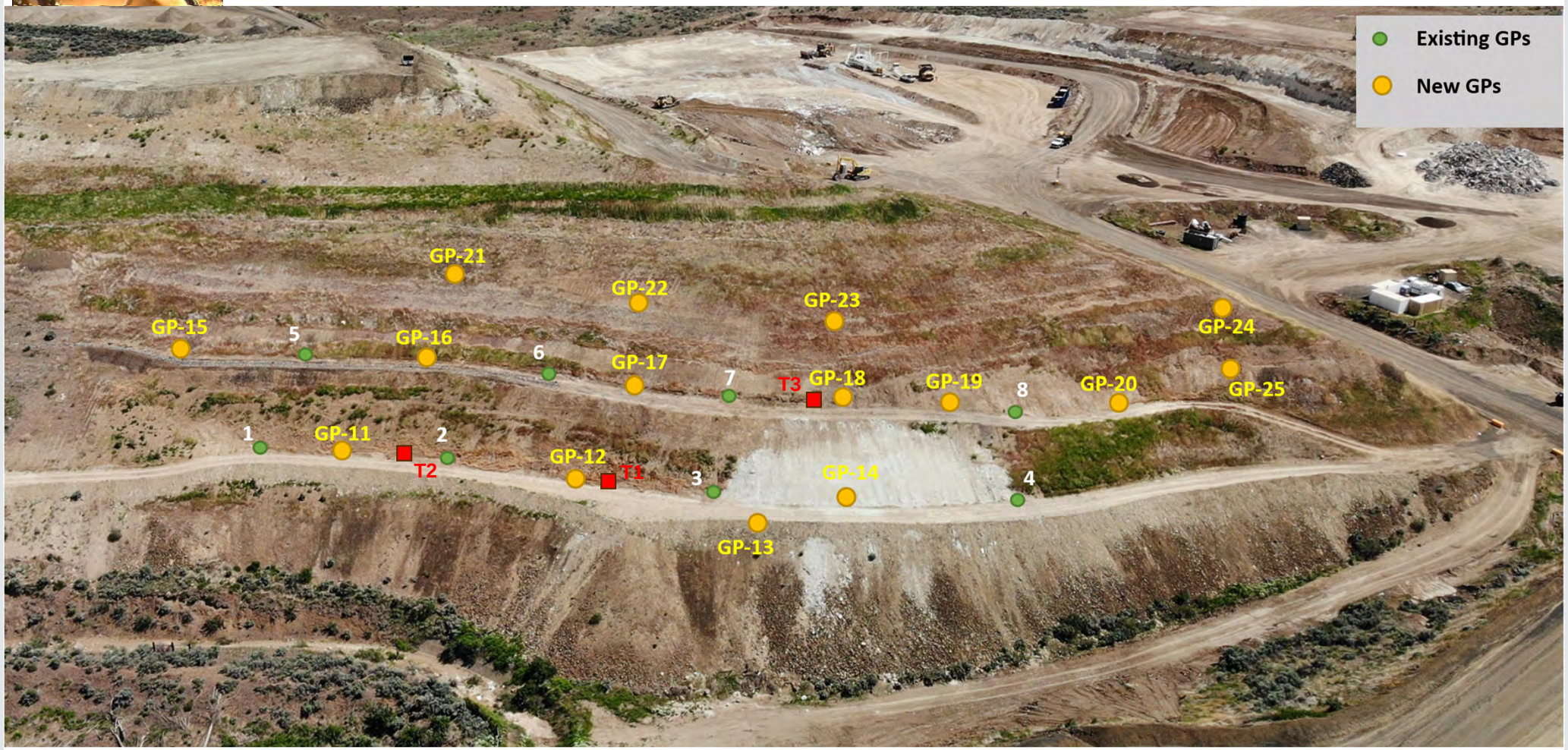
By:

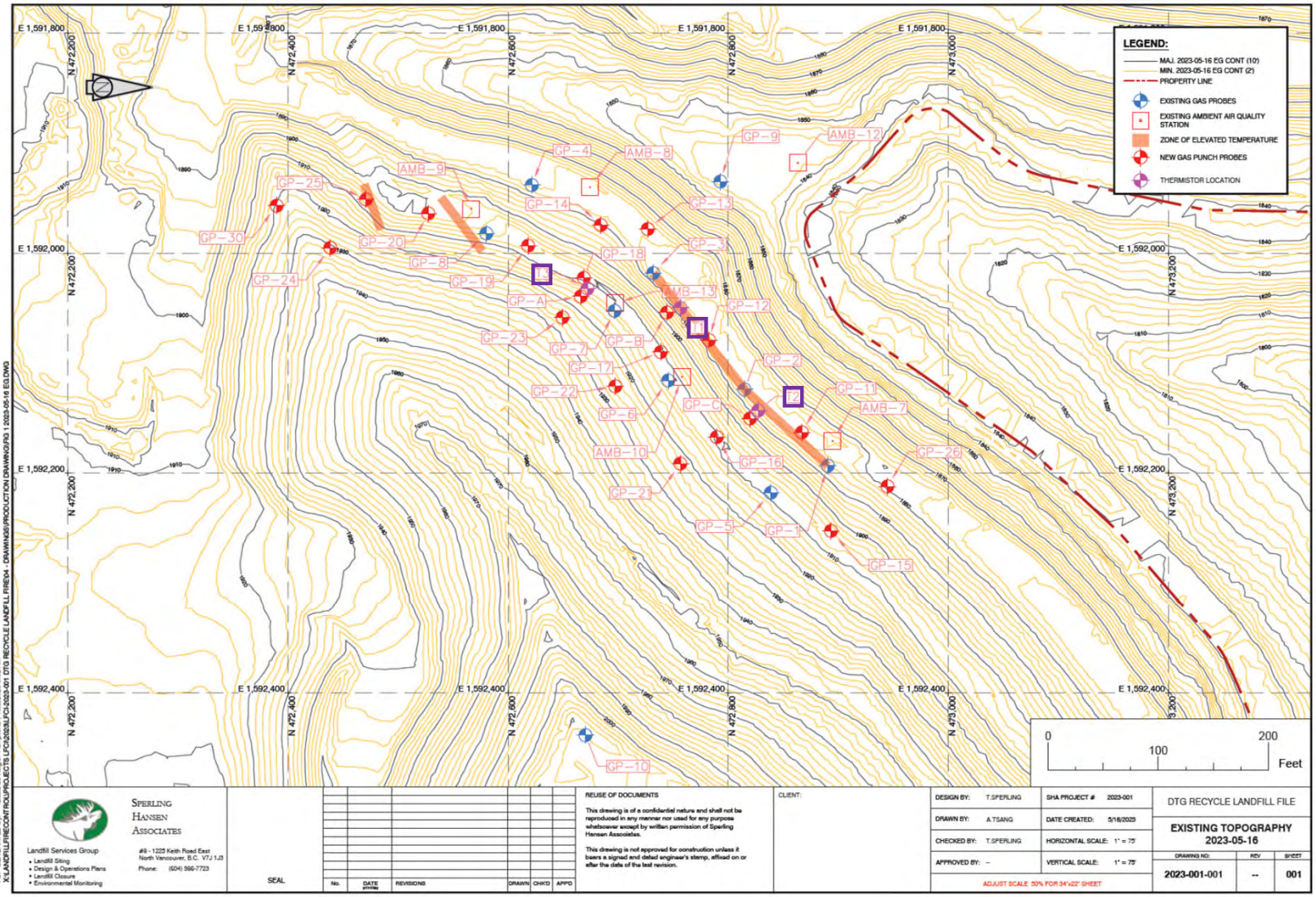
Dr. Tony Sperling, P.Eng.

Matthew Doornbos, EIT

January 3rd, 2025

Contents


LANDFILLFIRE.com
Existing GPs
New GPs
GP-21
GP-22
GP-23
GP-24
GP-15
5
GP-16
6
GP-17
7
T3
GP-18
GP-19
8
GP-20
GP-25
1
GP-11
2
T2
GP-12
T1
3
GP-14
4
GP-13



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SPERLING HANSEN ASSOCIATES

Landfill Services Group
- Landfill Siting
- Design & Operations Plans
- Landfill Closure
- Environmental Monitoring

#8 - 1225 Keith Road East
North Vancouver, B.C. V7J 1J3
Phone: (604) 986-7723

SEAL

No.	DATE	REVISIONS	DRAWN	CHKD	APP'D

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This drawing is not approved for construction unless it bears a signed and dated engineer's stamp, affixed on or after the date of the last revision.

CLIENT:

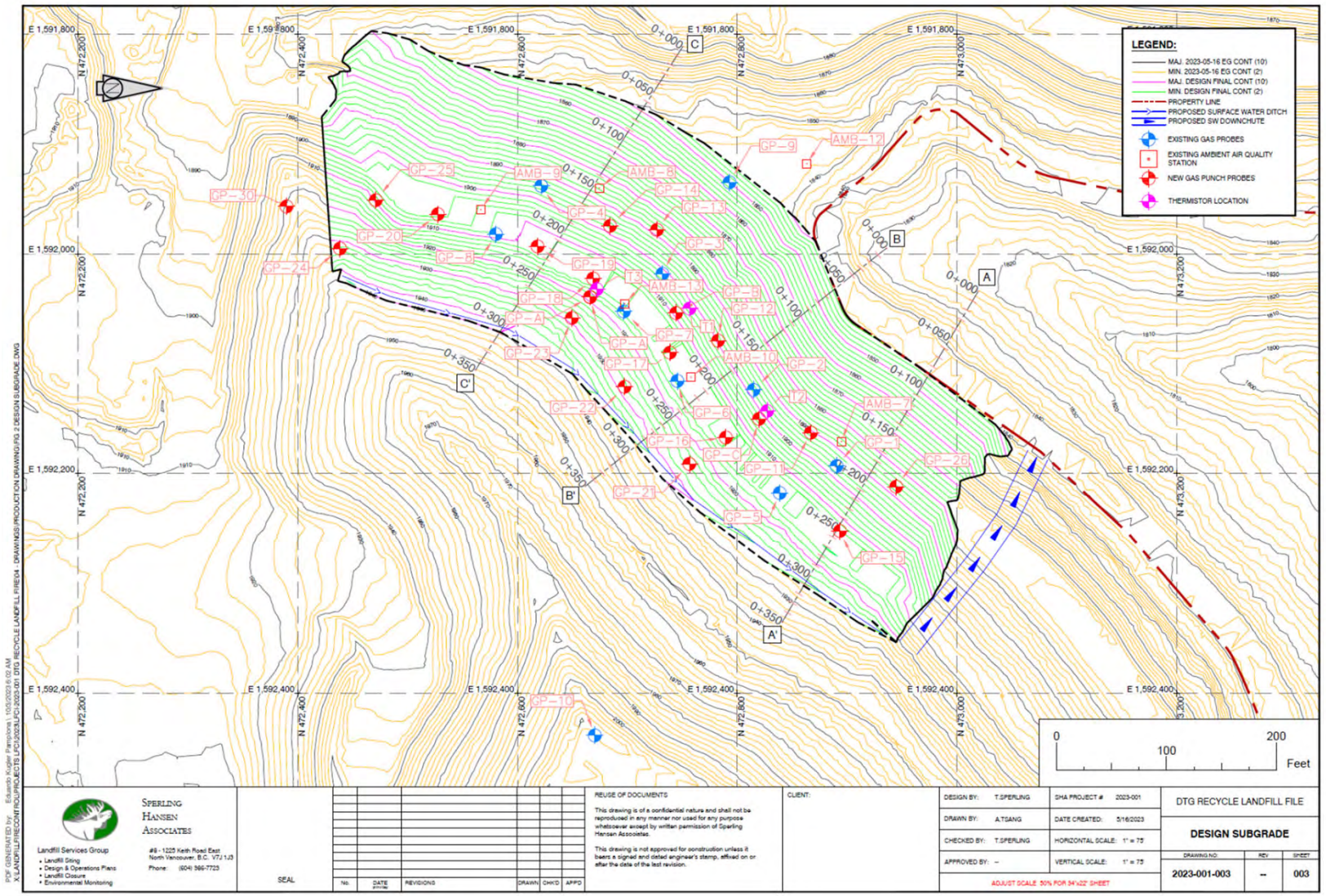
DESIGN BY:	T.SPERLING	SHA PROJECT #	2023-001
DRAWN BY:	A.TSANG	DATE CREATED:	5/16/2023
CHECKED BY:	T.SPERLING	HORIZONTAL SCALE:	1" = 75'
APPROVED BY:	--	VERTICAL SCALE:	1" = 75'

ADJUST SCALE: 30% FOR 34"x22" SHEET

DTG RECYCLE LANDFILL FILE

EXISTING TOPOGRAPHY 2023-05-16

DRAWING NO:	REV	SHEET
2023-001-001	--	001



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X:\LANDFILL\RECONTROL\PROJECTS UPC\2023\UPC\2023-001 DTG RECYCLE LANDFILL FIRE\04 - DRAWINGS\PRODUCTION DRAWING\FIG 2 DESIGN SUBGRADE.DWG

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DTG RECYCLE LANDFILL FILE

DESIGN SUBGRADE

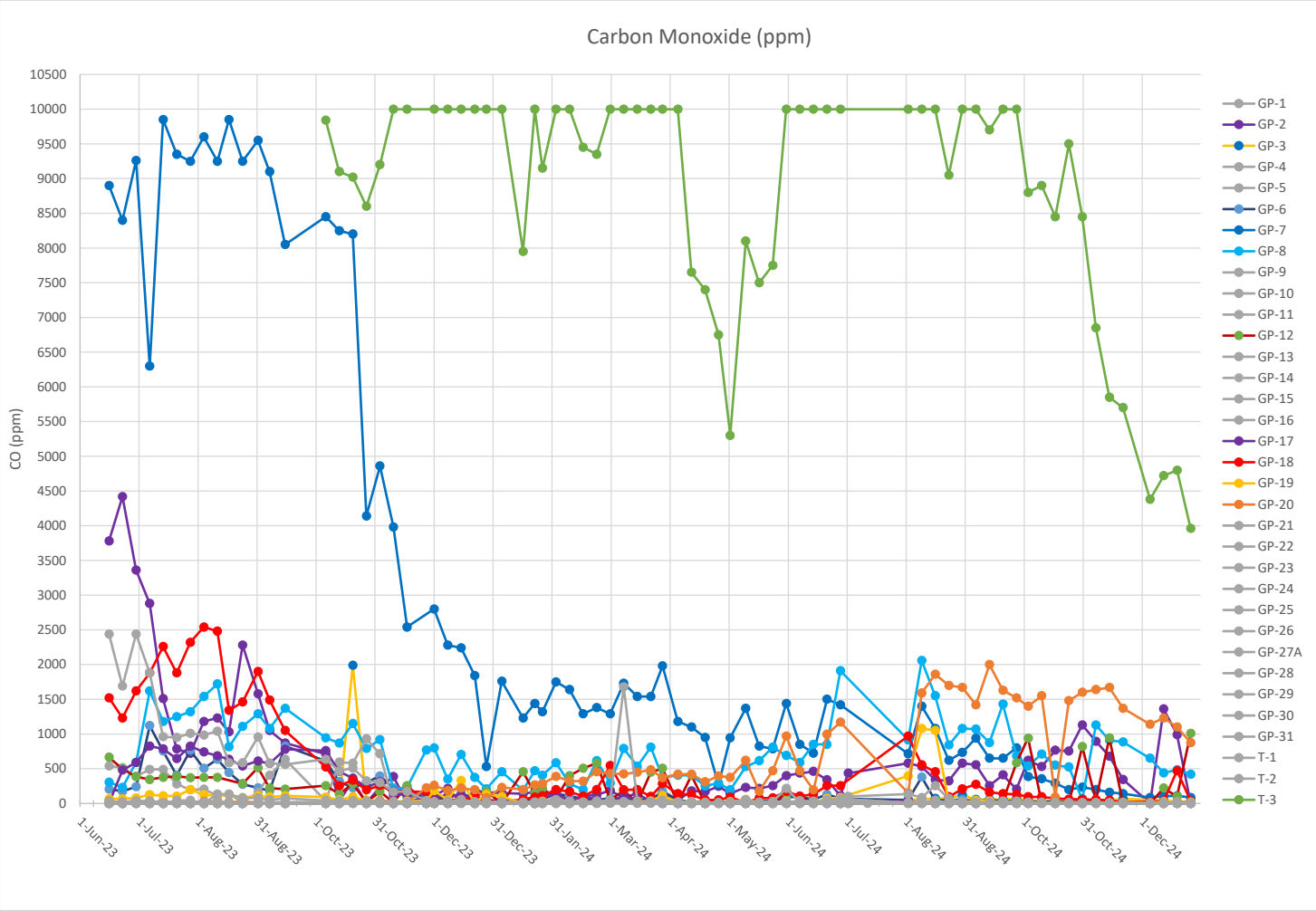
DRAWING NO.	REV.	SHEET
2023-001-003	--	003

Carbon Monoxide

The beginning of December experienced a large pressure swing, causing the CO levels to rise as the fire likely flared up somewhat.

Throughout December the fire was carefully monitored, and CO levels are now decreasing again.

CO levels in GP-12 have increased significantly in the last week to 1000ppm. LFCI to monitor.

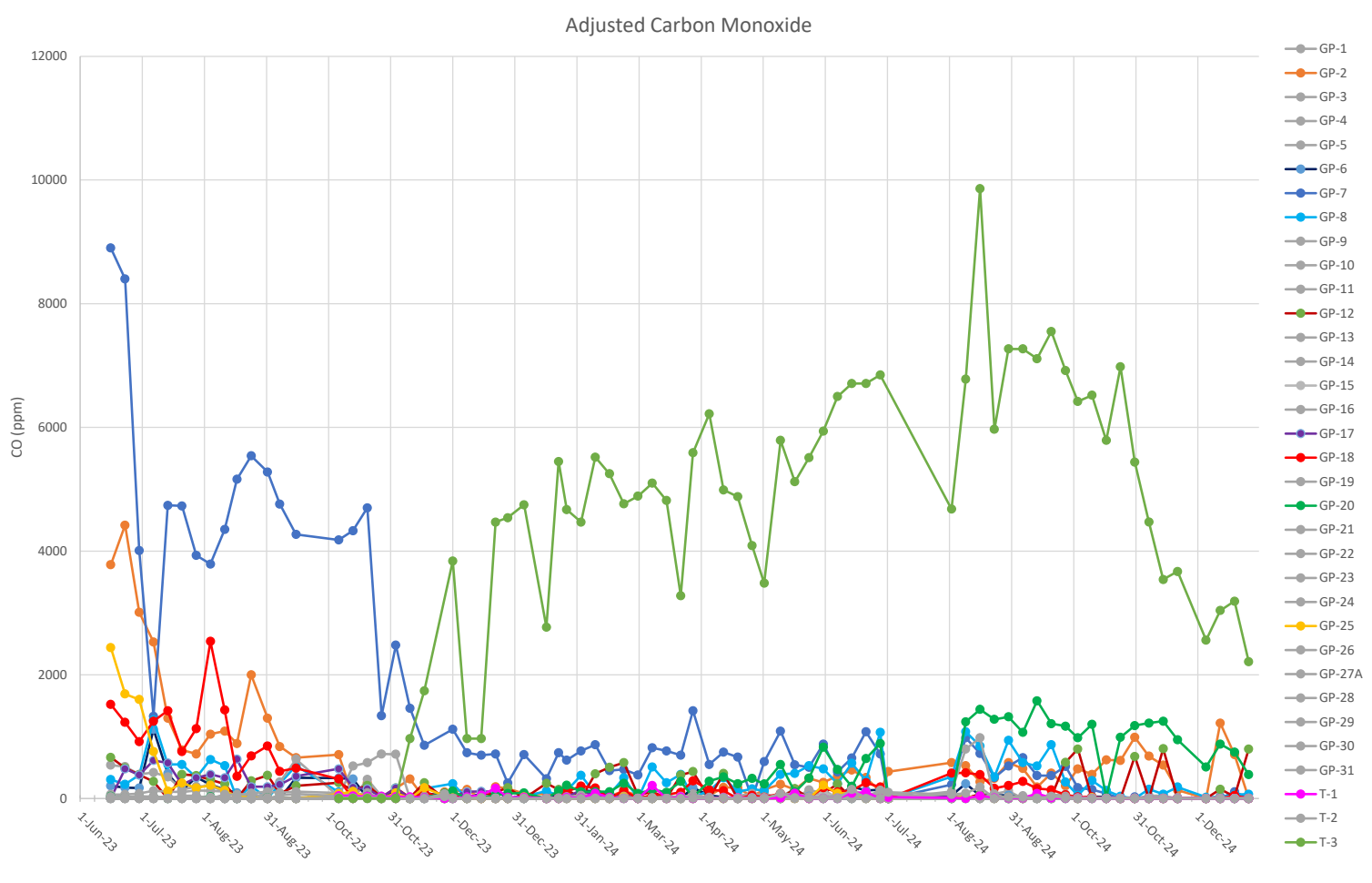


CO Adjusted for H2 Gas

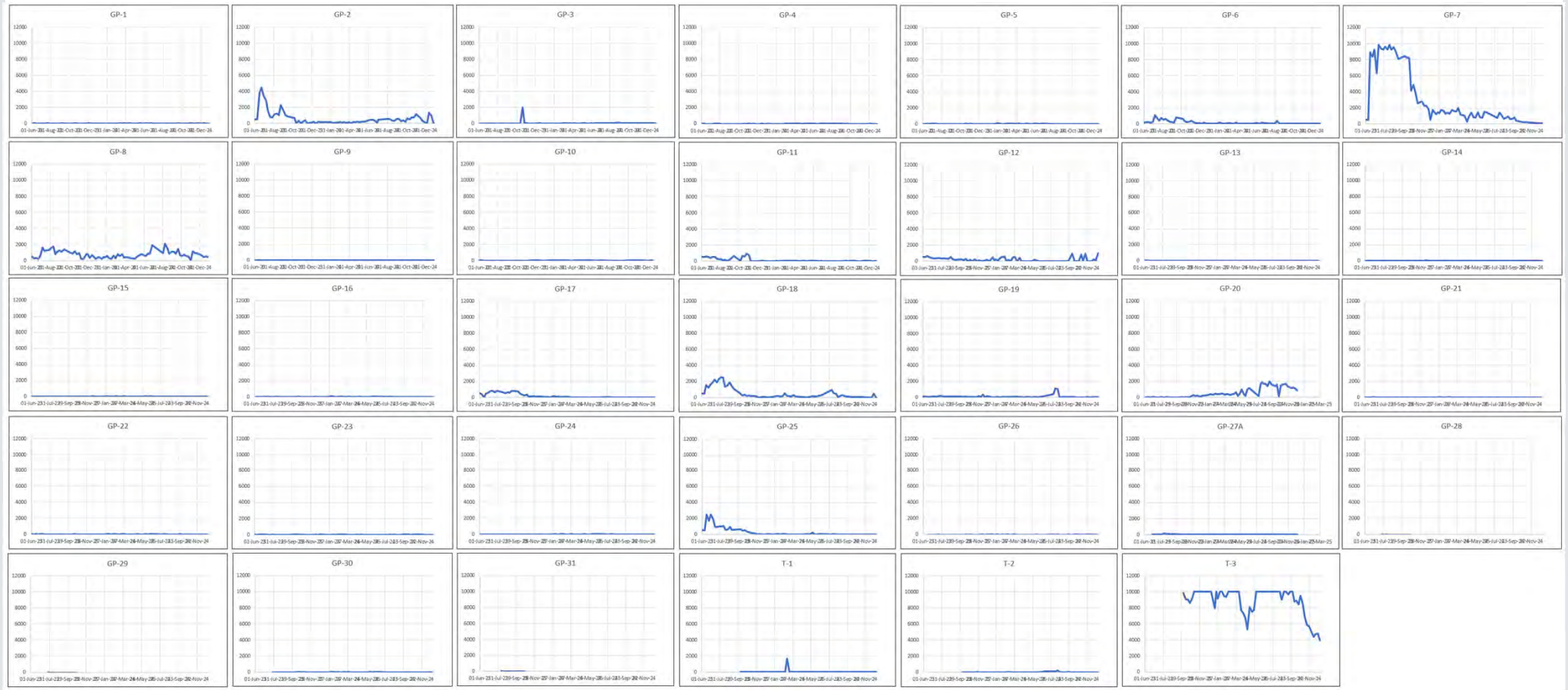
CO adjusted has been consistently decreasing since August 2024.

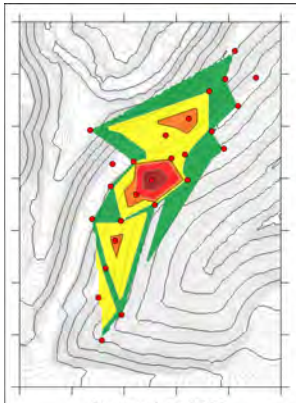
Projection for reaching 200 ppm is currently at about 3 months.

Note that prior to August, 2024 most data was >10,000 ppm, so graphed increase prior to this time is not truly representative.



CO Levels by Individual Wells





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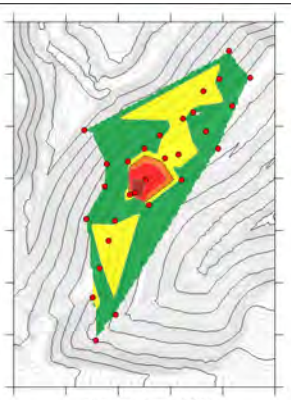

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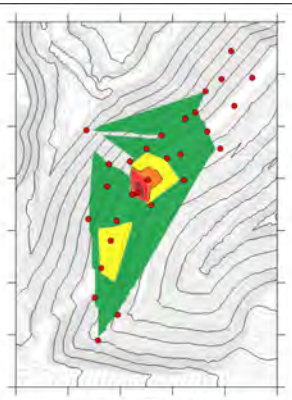

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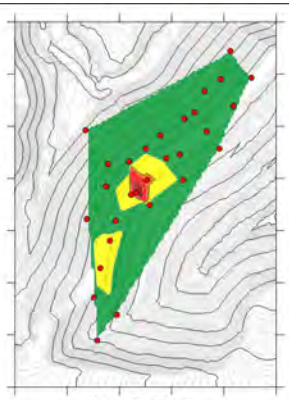

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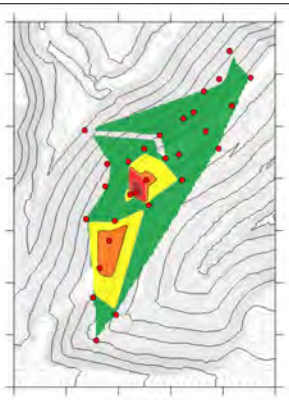

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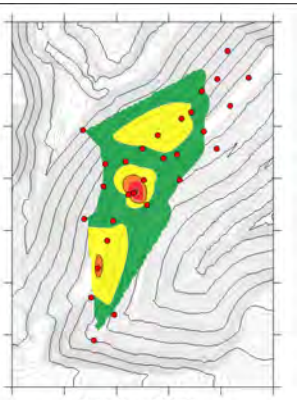

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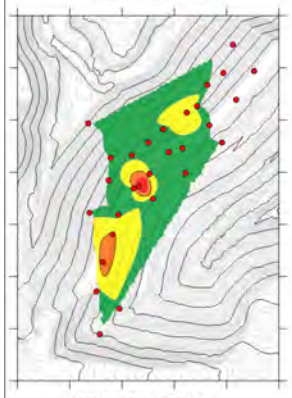

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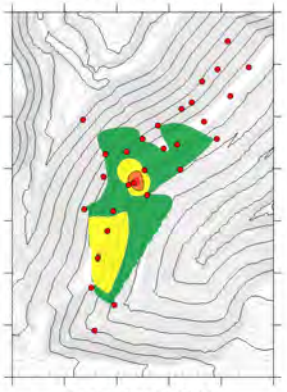
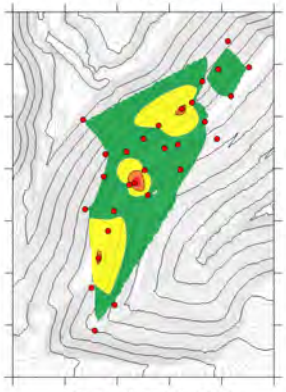


December 5, 2024



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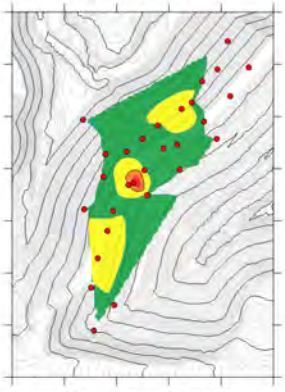
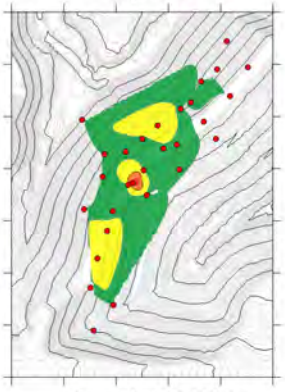


December 19, 2024



December 26, 2024

- Data taken from first monitoring event of each month unless noted otherwise
- Data was linearly interpolated between data points
- Datapoints (probe locations) represented in red
- CO levels are measured in ppm
- Ground contours are of existing ground at beginning of project, with design contours added for after addition of fill

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No.	DATE yr/m/day	REVISIONS	DRAWN	CHK'D	APP'D
1	2025/01/03	ISSUED FOR REVIEW	MD	TS	TS

DTG Recycle

DESIGN BY:	T. SPERLING
DRAWN BY:	M. DOORNBOS
DATE CREATED:	2025/01/03
SHA PROJECT #	LFCI-2023-001

DTG RECYCLE LANDFILL FIRE

MONTHLY MONITORING SUMMARY SPATIAL MAPS - CO

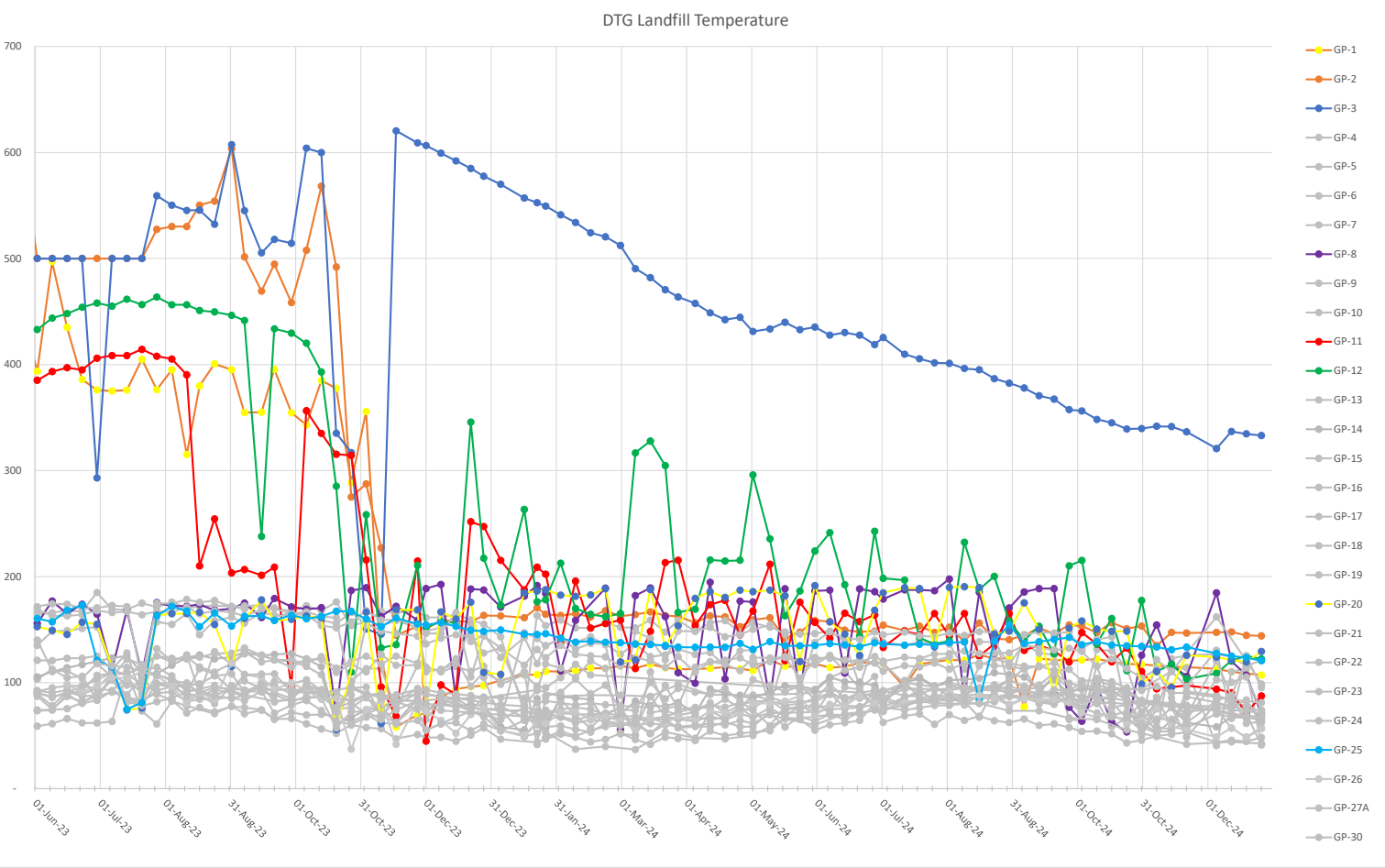
DRAWING NO.	REV	SHEET
LFCI-2023-001-12-CO	1	1

Temperature (F)

Temperatures flared up at the beginning of December likely due to the large positive pressure swing experienced. Temperatures have now stabilized and are once again decreasing.

This trend matches with slowly declining temperatures in T-1 at 30’ below ground, currently around 280F.

All other wells have remained low, with some variability possibly caused by atmospheric pressure swings.

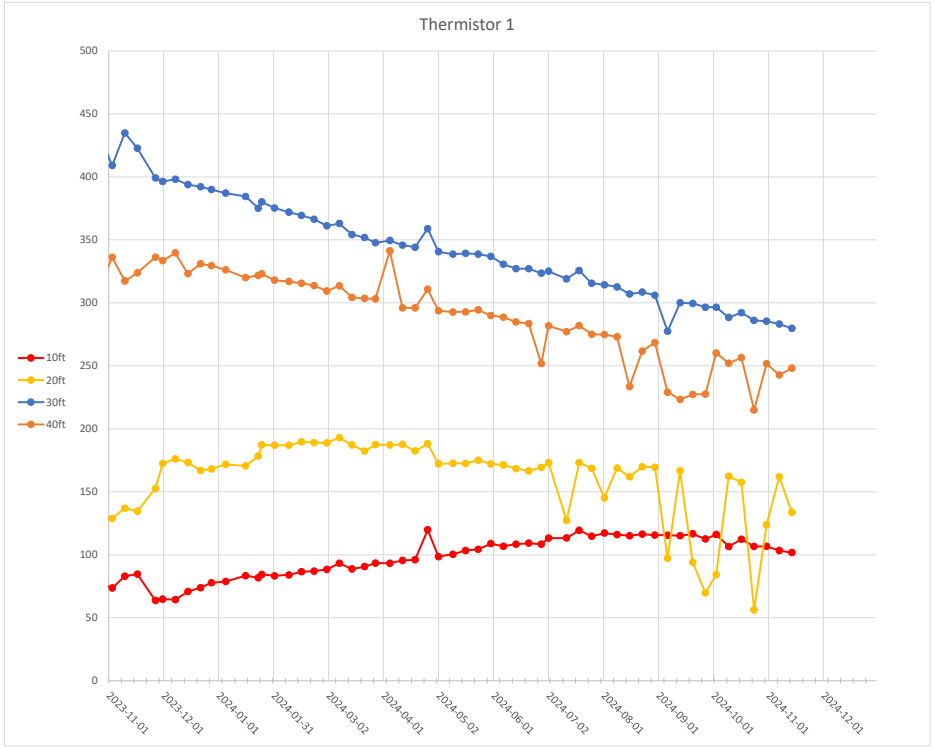


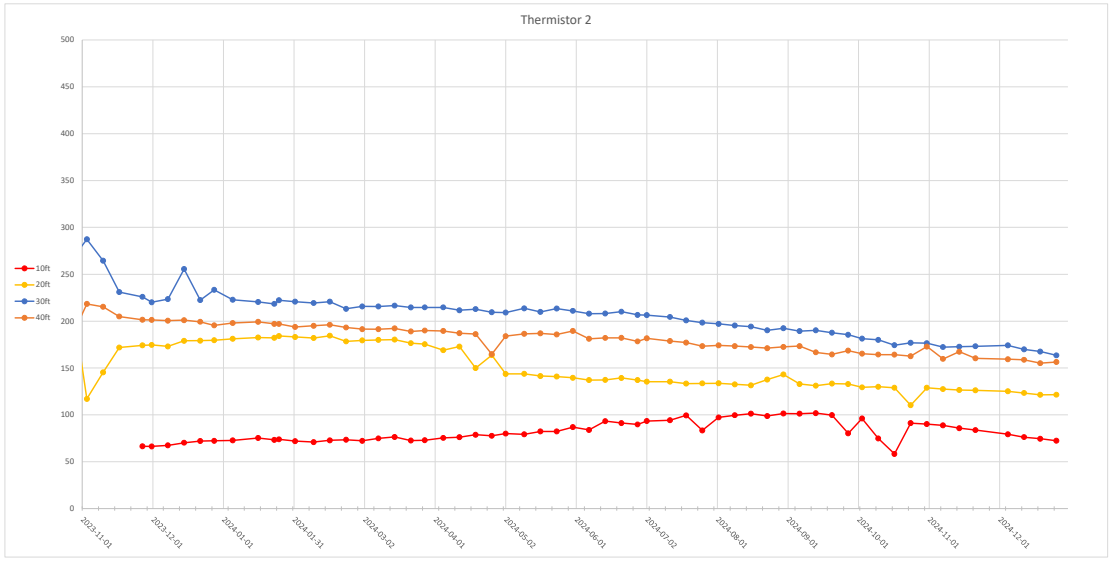
Thermistor Temperatures

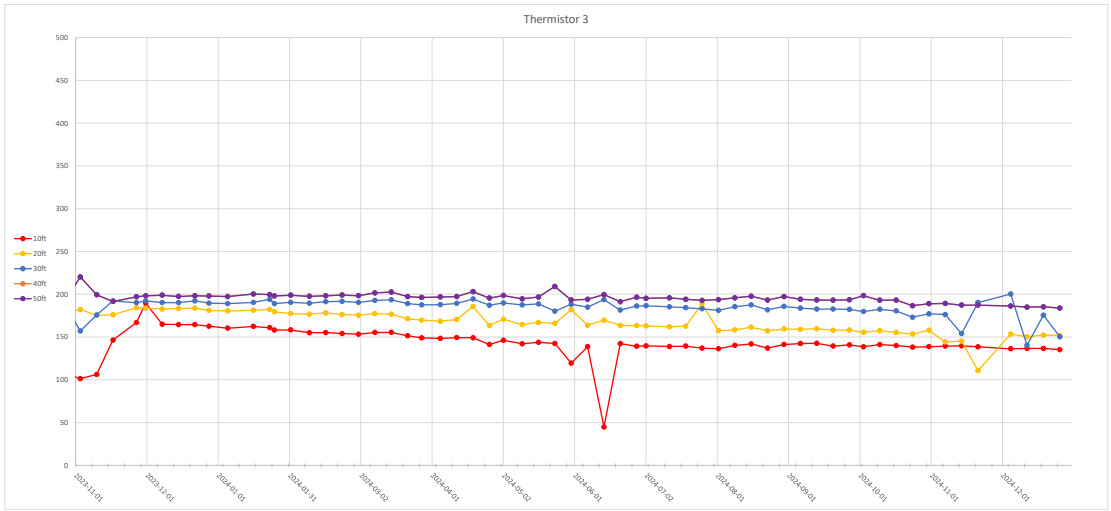
Thermistor temperatures mostly stable, with downward trend in T-1 and general levelling trend in T-2 and T-3 continuing. Monitoring of T-1 recommended to ensure no major changes. Noted that the deeper measurement of 20ft below surface is cooler than measurements at 10ft depth but oscillations indicate there is an issue with the temperature readings as 20 ft. on T-1. Consideration should be given to installing a dedicated thermistor.

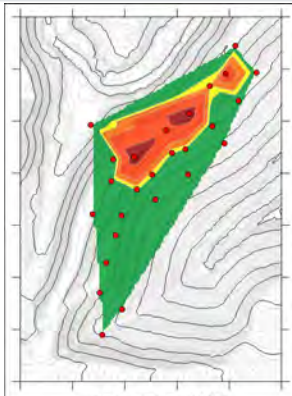
Rate of thermal decrease is very slow, 50 degrees every 4 months. We project about 2 years will be needed to get to desired baseline levels around 122F without additional cooling effort.

Spatial heat map confirms that cooling trend continues across landfill, with hot spots shrinking in size.









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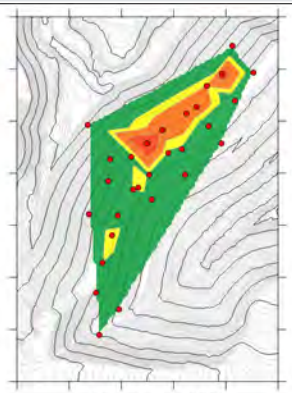

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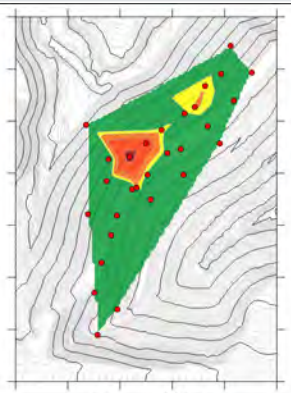

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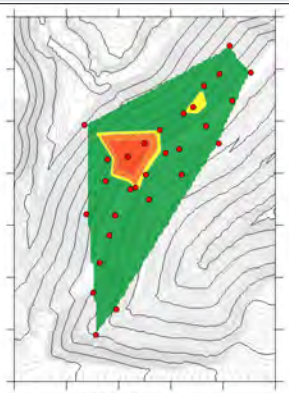

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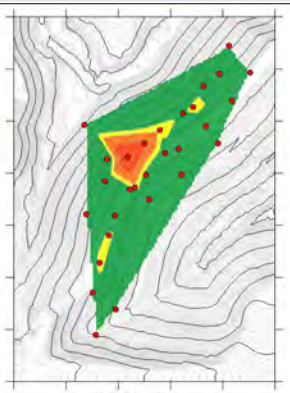

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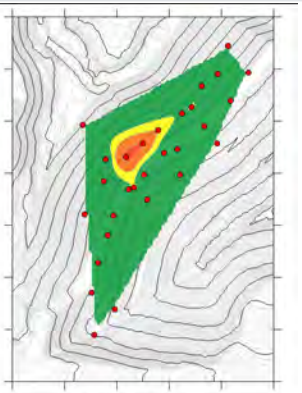
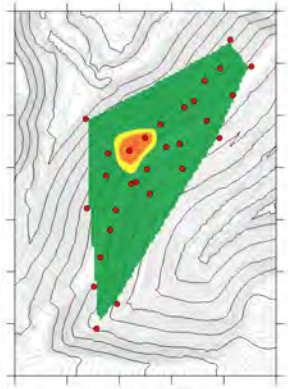


October 2024



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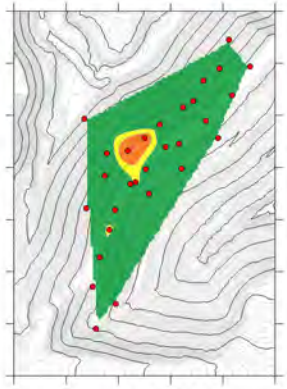

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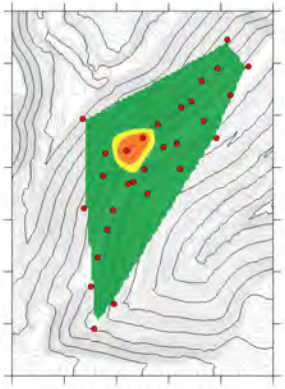
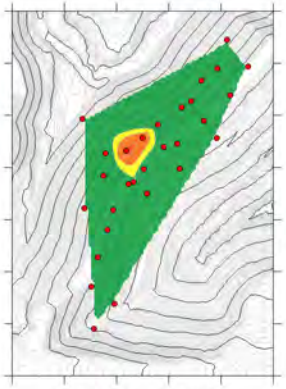
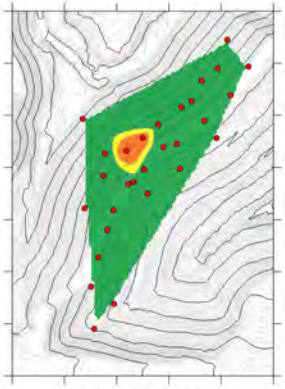


December 12, 2024



December 19, 2024



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LANDFILLFIRE.com

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DTG Recycle

DESIGN BY:	T. SPERLING
DRAWN BY:	M. DOORNBOS
DATE CREATED:	2025/01/03
SHA PROJECT #	LFCI-2023-001

DTG RECYCLE LANDFILL FIRE

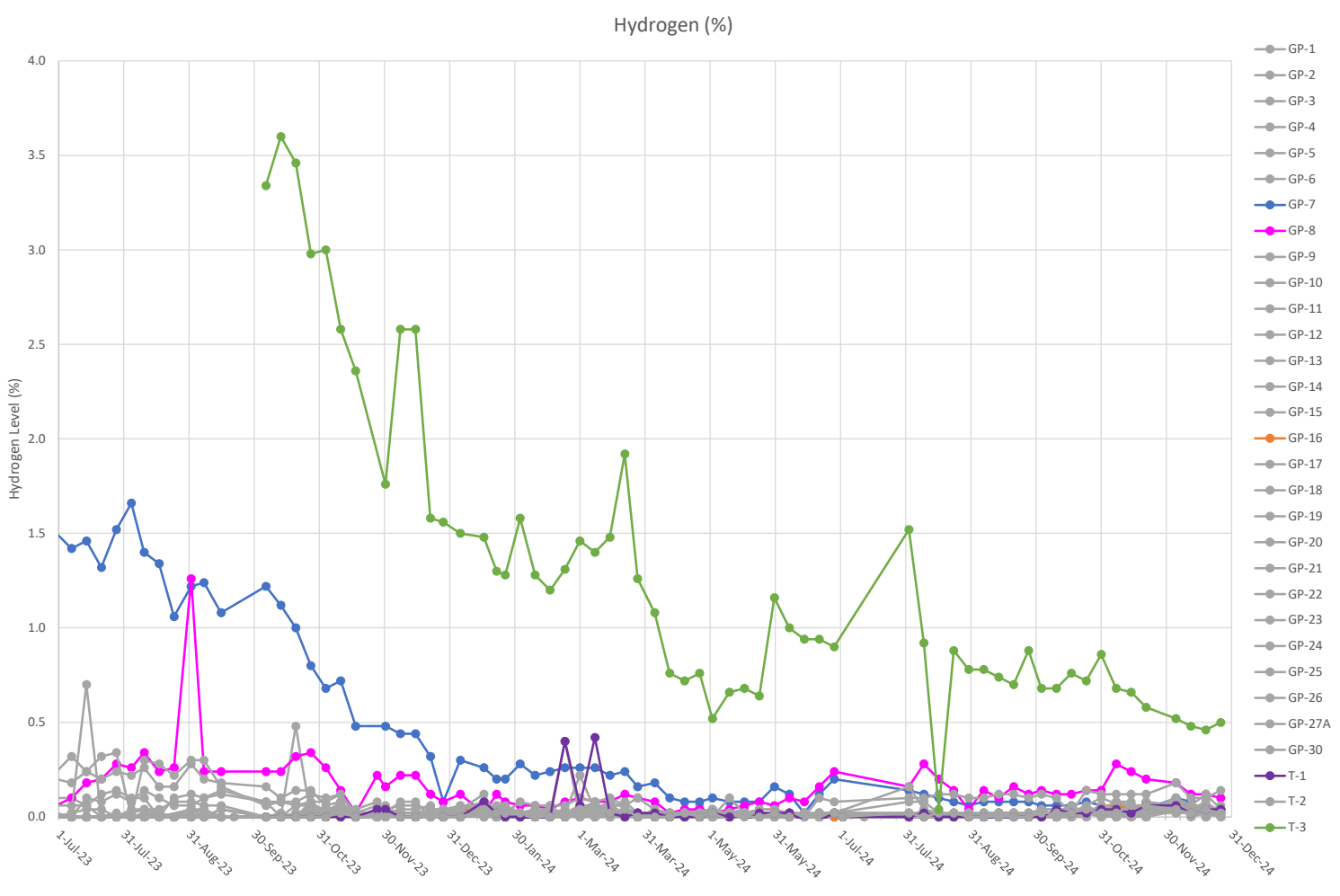
MONTHLY MONITORING SUMMARY SPATIAL MAPS - TEMPERATURE

DRAWING NO.	REV	SHEET
LFCI-2023-001-12-TEMP	1	1

Hydrogen

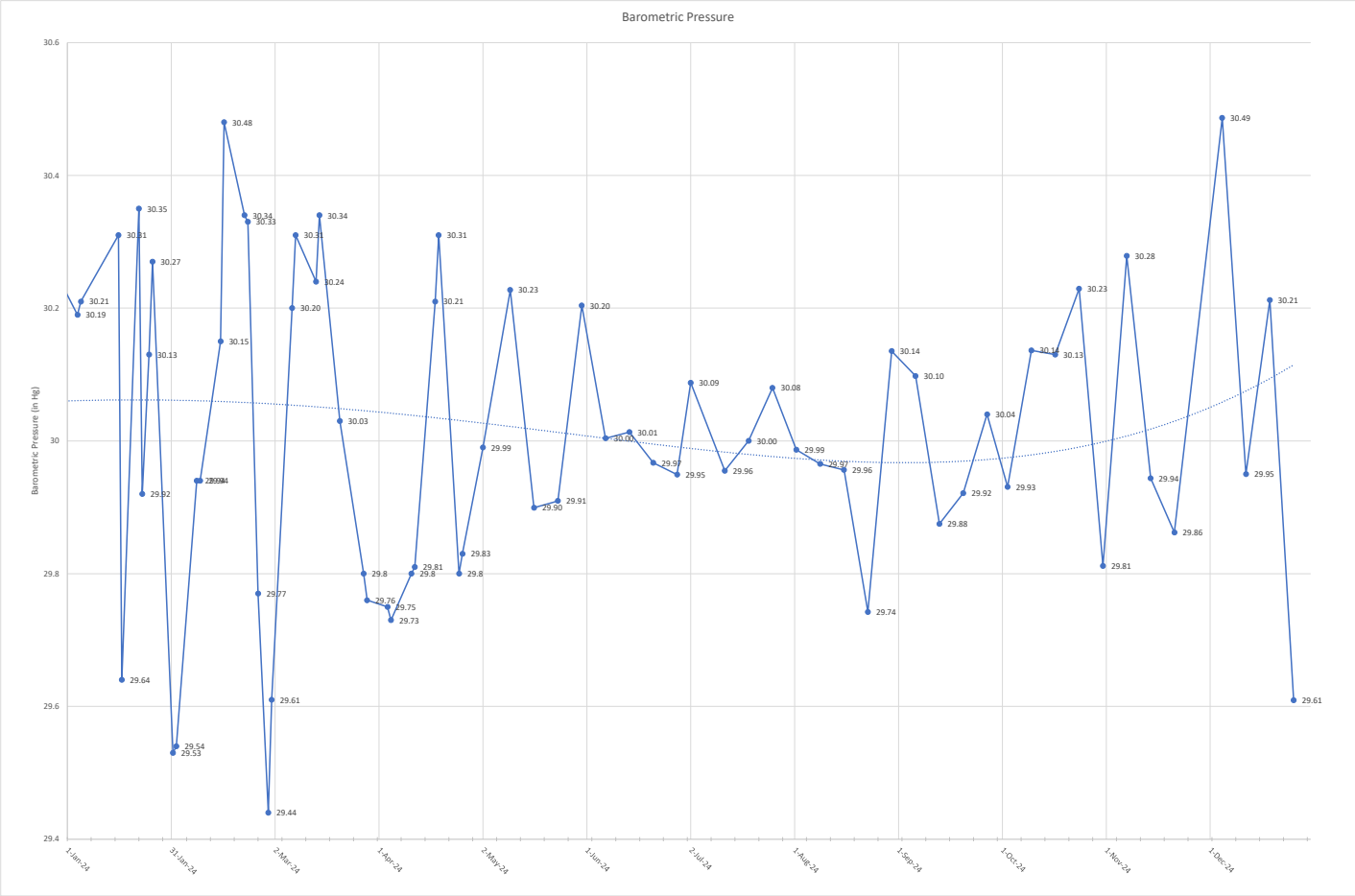
Hydrogen has remained stable around 0.8% in T-3 since mid August. Slight upward tick at end of the month, monitoring will continue.

Hydrogen remains very low in all other wells. Production of H_2 is often observed with smoldering waste. LFCI believes that the level of H_2 dropping indicates that the fire is less active.



Barometric Pressure

The site observed large swings in the barometric pressure over the last month. In particular the large positive pressure swing at the beginning of December is believed to have caused increased fire activity that has now subsided.

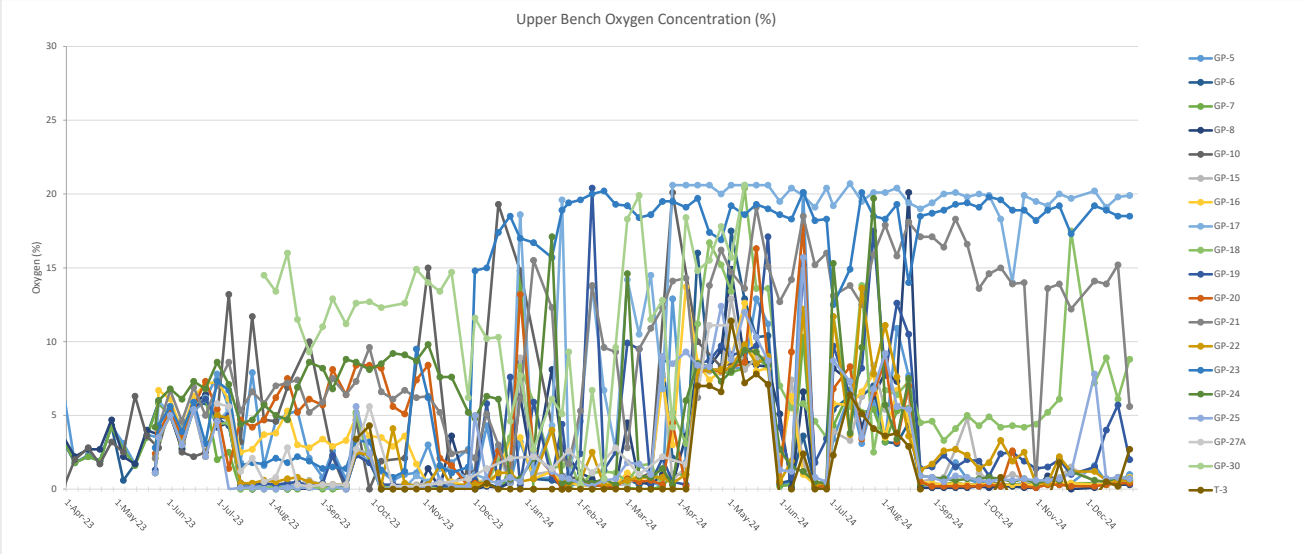


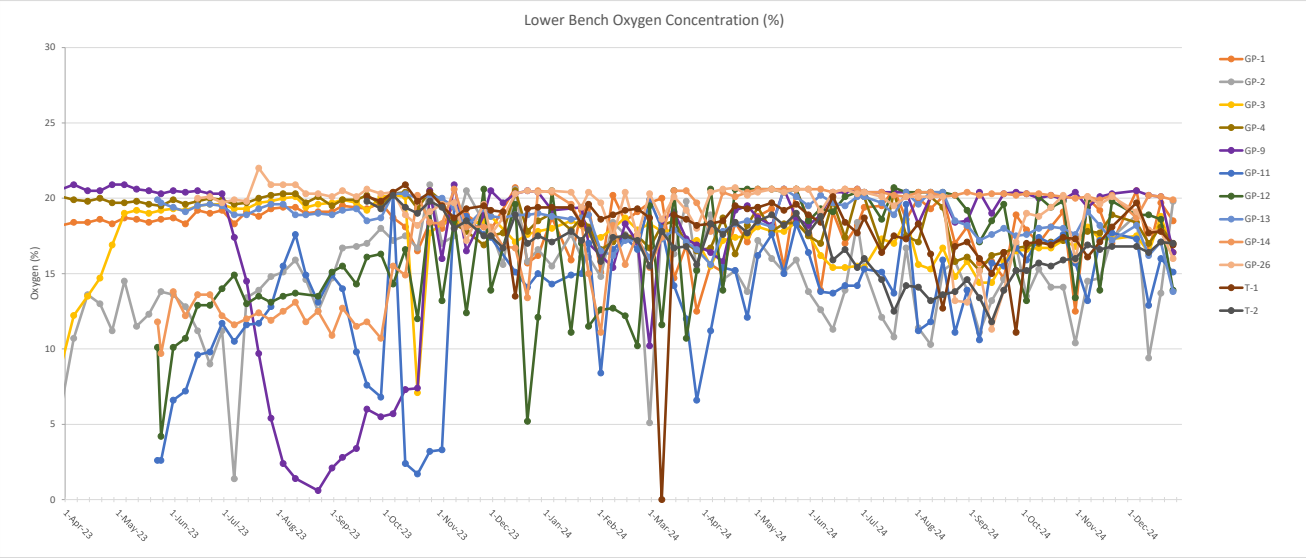
Oxygen

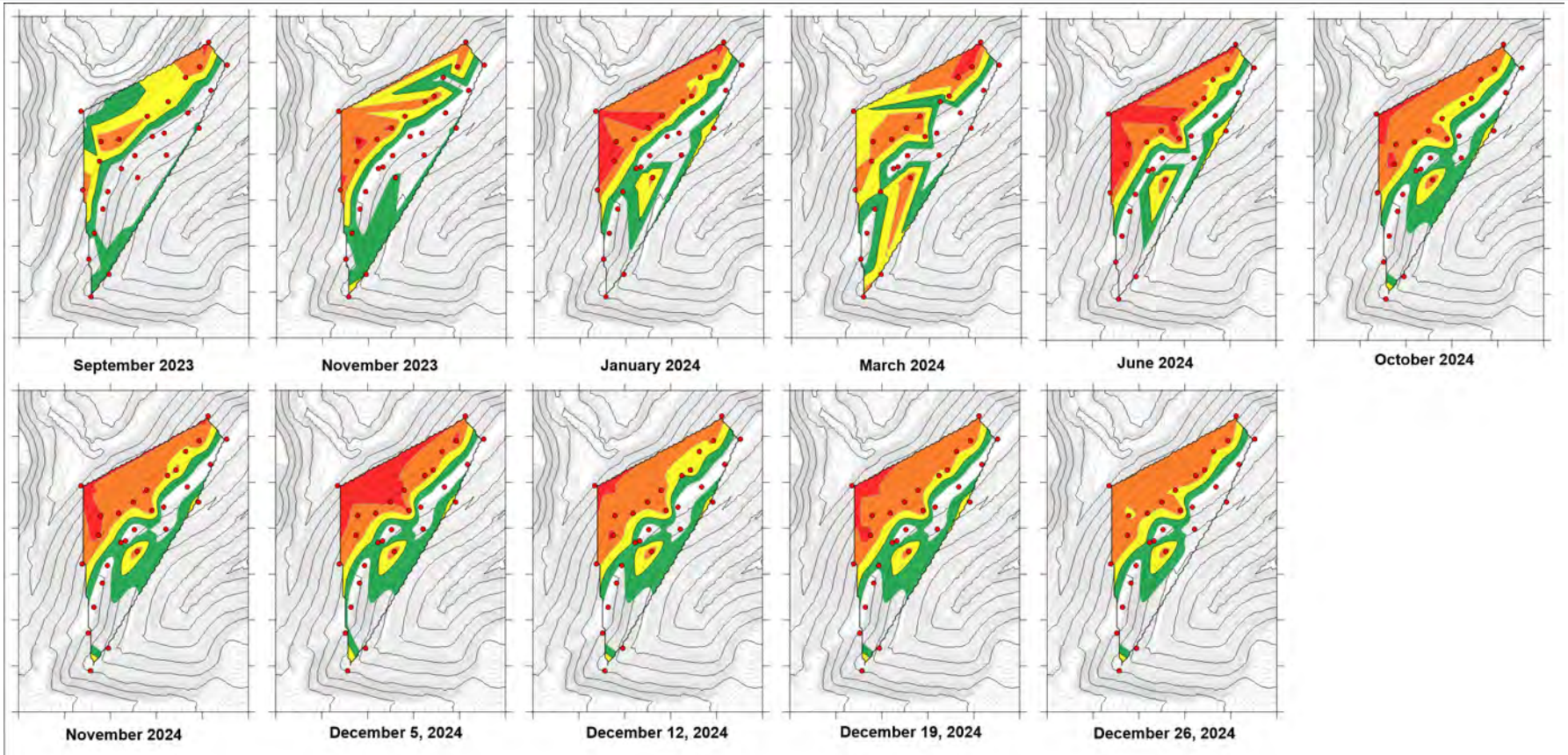
The oldest portion of the landfill is likely relatively inert and biologically inactive, producing very little methane. As a result, the pore space is full of atmospheric air.

Some GPs likely susceptible to swings in pressure – LFCI believes this is causing the spikes. This theory continues to fit with the pressure spikes noted in December.

Noted that higher levels of oxygen in GP-9 at landfill toe (>20%) are causing the spatial maps to be somewhat skewed, indicating air intrusion throughout the toe of the landfill. This is likely not a true portrayal of O2 levels within the fill.







- Data taken from first monitoring event of each month
- Data was linearly interpolated between data points
- Datapoints (probe locations) represented in red
- O2 levels are measured in % composition
- Ground contours are of existing ground at beginning of project, with design contours added for after addition of fill

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No.	DATE yr/m/day	REVISIONS	DRAWN	CHK'D	APP'D
1	2025/01/03	ISSUED FOR REVIEW	MD	TS	TS

DTG Recycle

DESIGN BY:	T. SPERLING
DRAWN BY:	M. DOORNBOS
DATE CREATED:	2025/01/03
SHA PROJECT #	LFCI-2023-001

DTG RECYCLE LANDFILL FIRE

MONTHLY MONITORING SUMMARY SPATIAL MAPS - O2

DRAWING NO.	REV	SHEET
LFCI-2023-001-12-O2	1	1

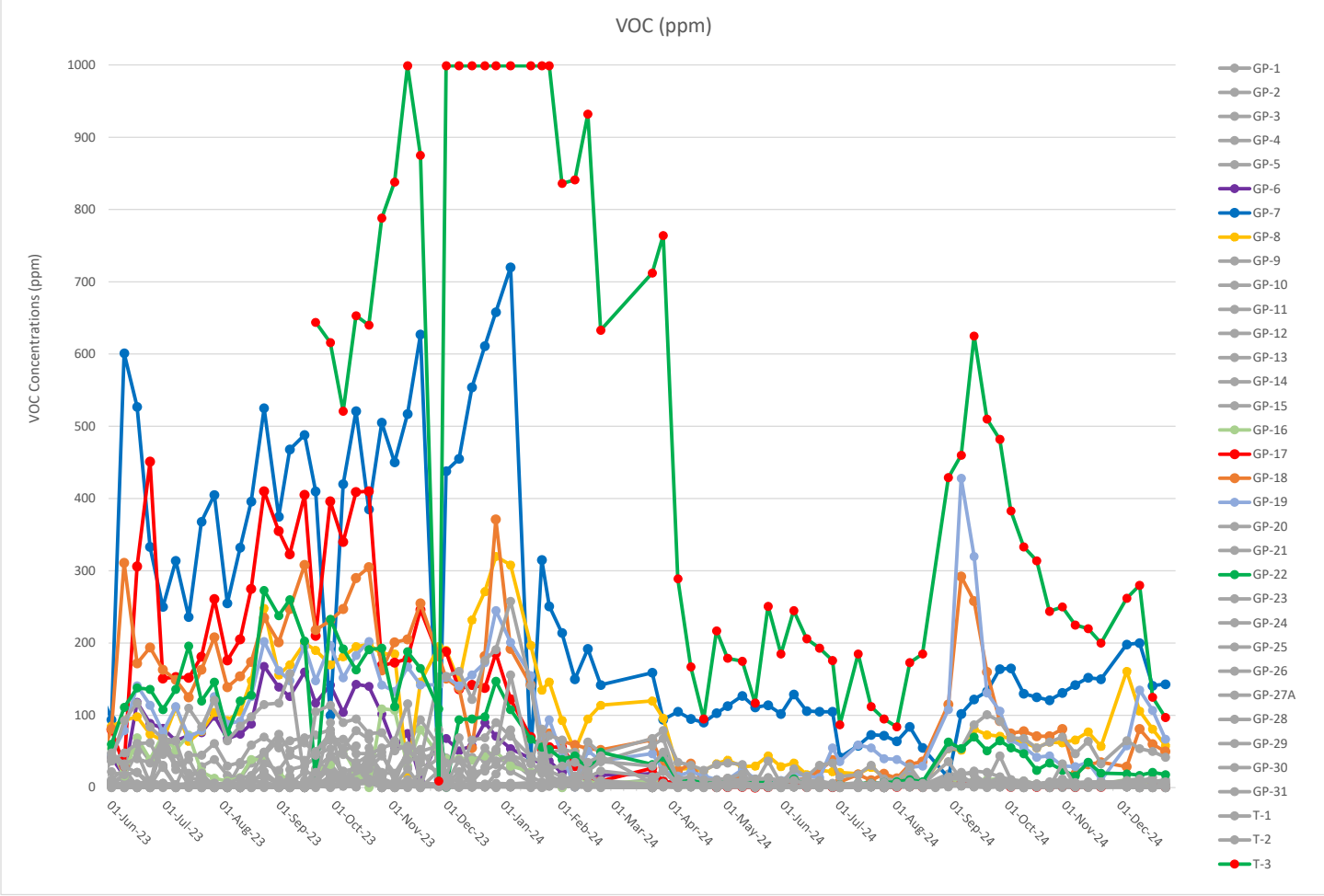
Volatile Organic Compounds

Increase seen VOC concentration in T-3 in August has been decreasing since early September.

Through December, T-3 continued to decrease following the sharp upward spike. Currently, GP-7 has the highest levels of VOC.

Low VOC levels indicate reduced smolder activity.

LFCI is monitoring closely to ensure any negative trends are caught early.

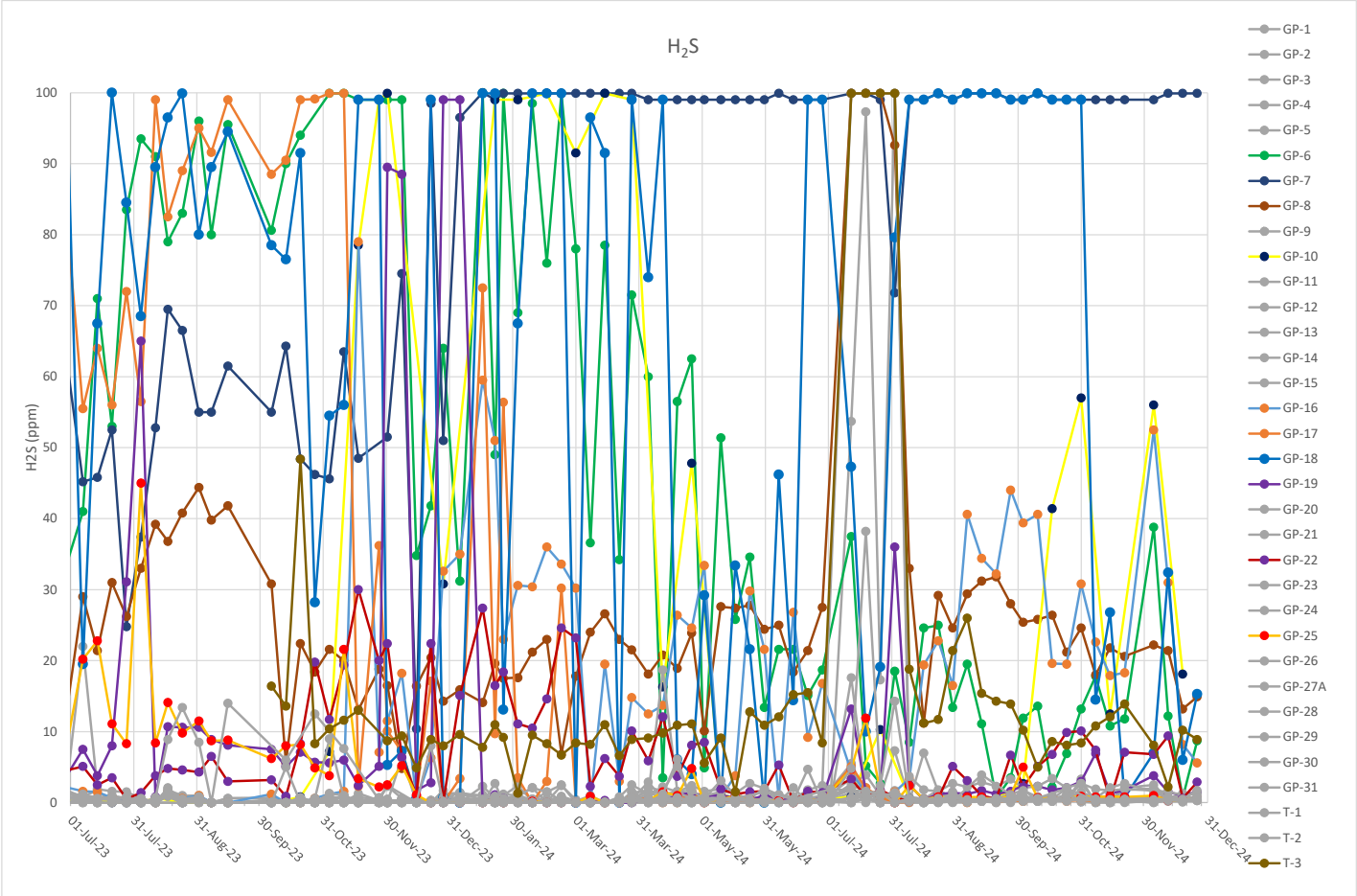


Hydrogen Sulfide

H_2S data continues to be noisy, likely affected by atmospheric pressure fluctuation.

GP-7 remains high, and along with GP-18 is in the area that LFCI believes gases are venting.

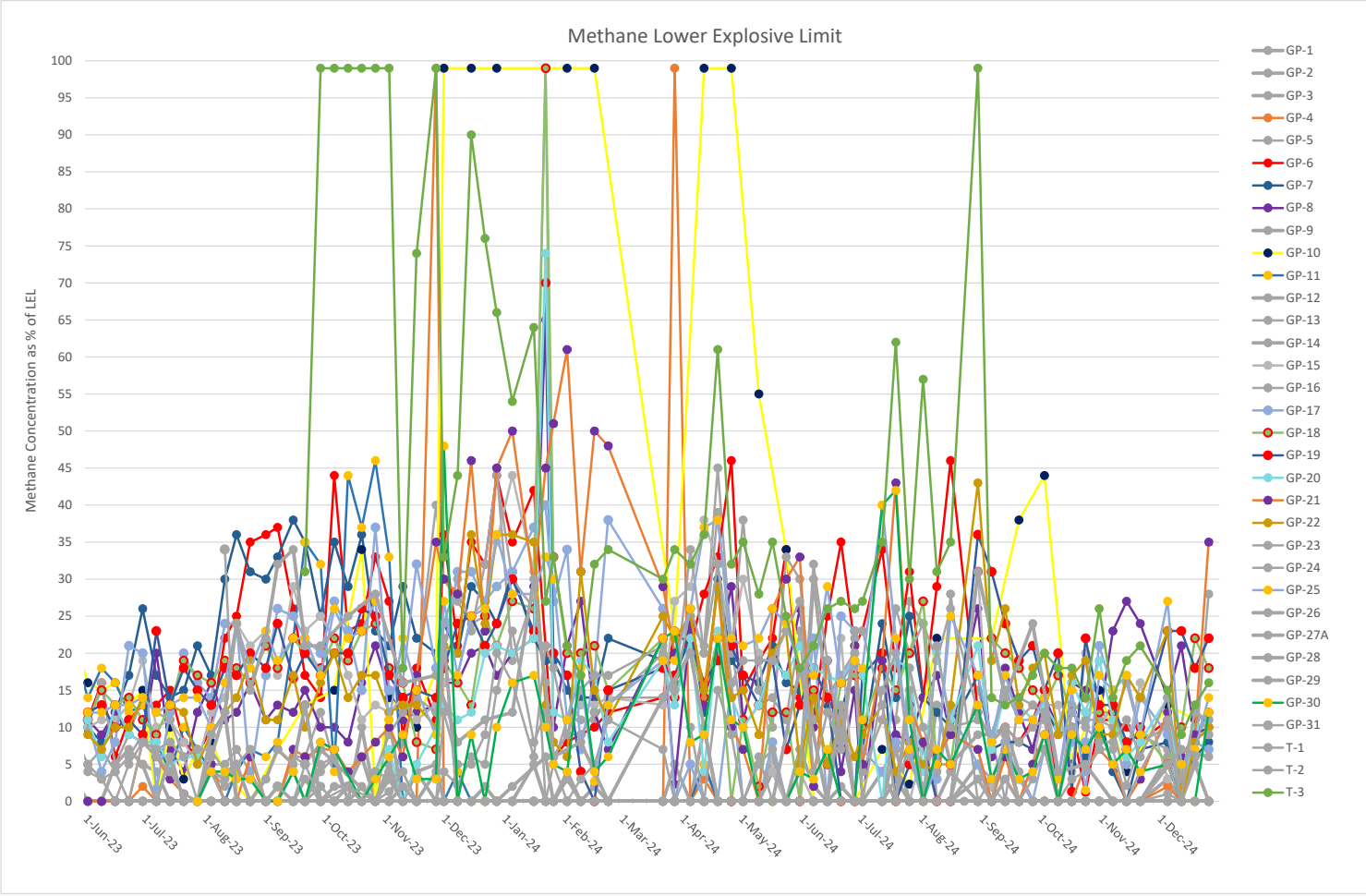
As mentioned previously, it is possible that the H_2S sensor is being impacted by CO cross interference. With CO concentration decreasing, reported H2S concentration is dropping as well.



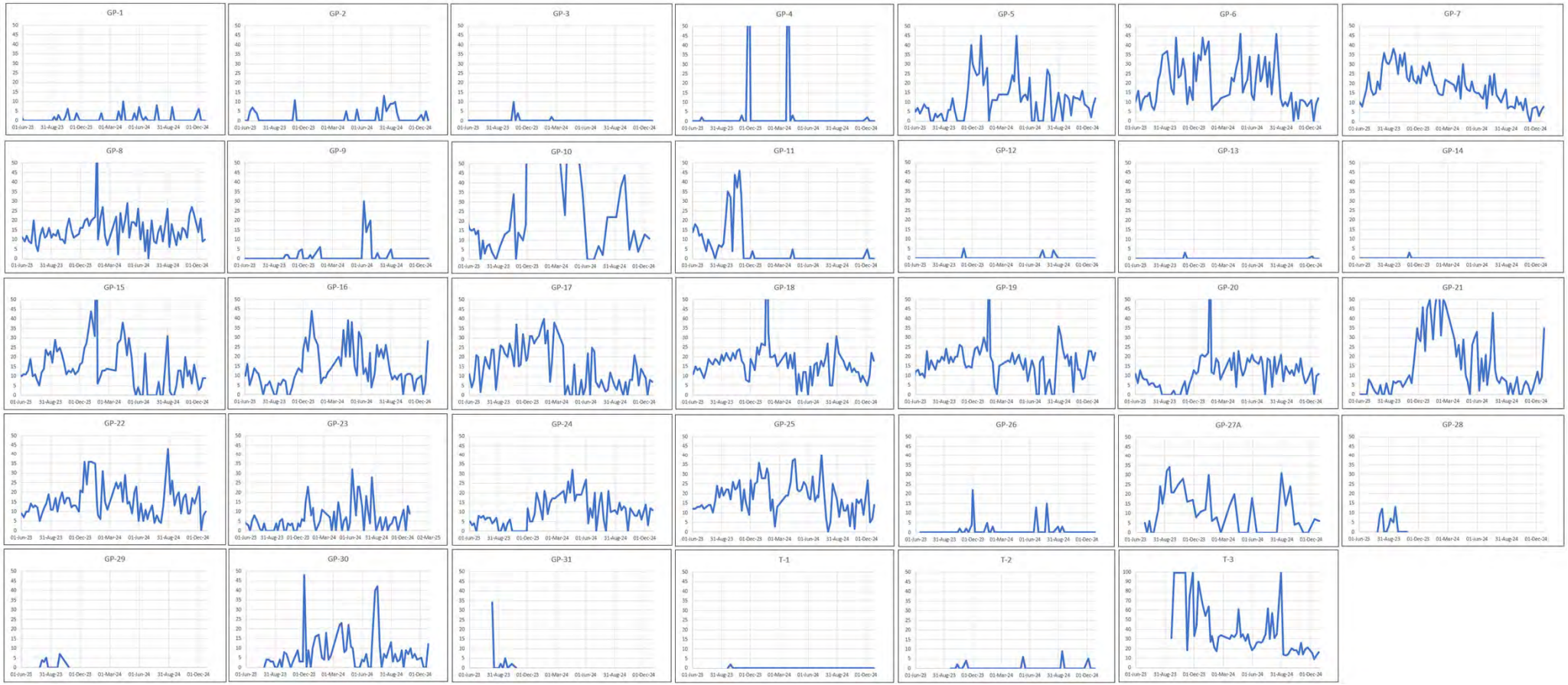
Lower Explosive Limit

Many data points fluctuating wildly – methane composition is a better indicator of levels within the landfill.

Overall decrease in LEL over last month. LFCI suspects that this may be linked to the large pressure swings.



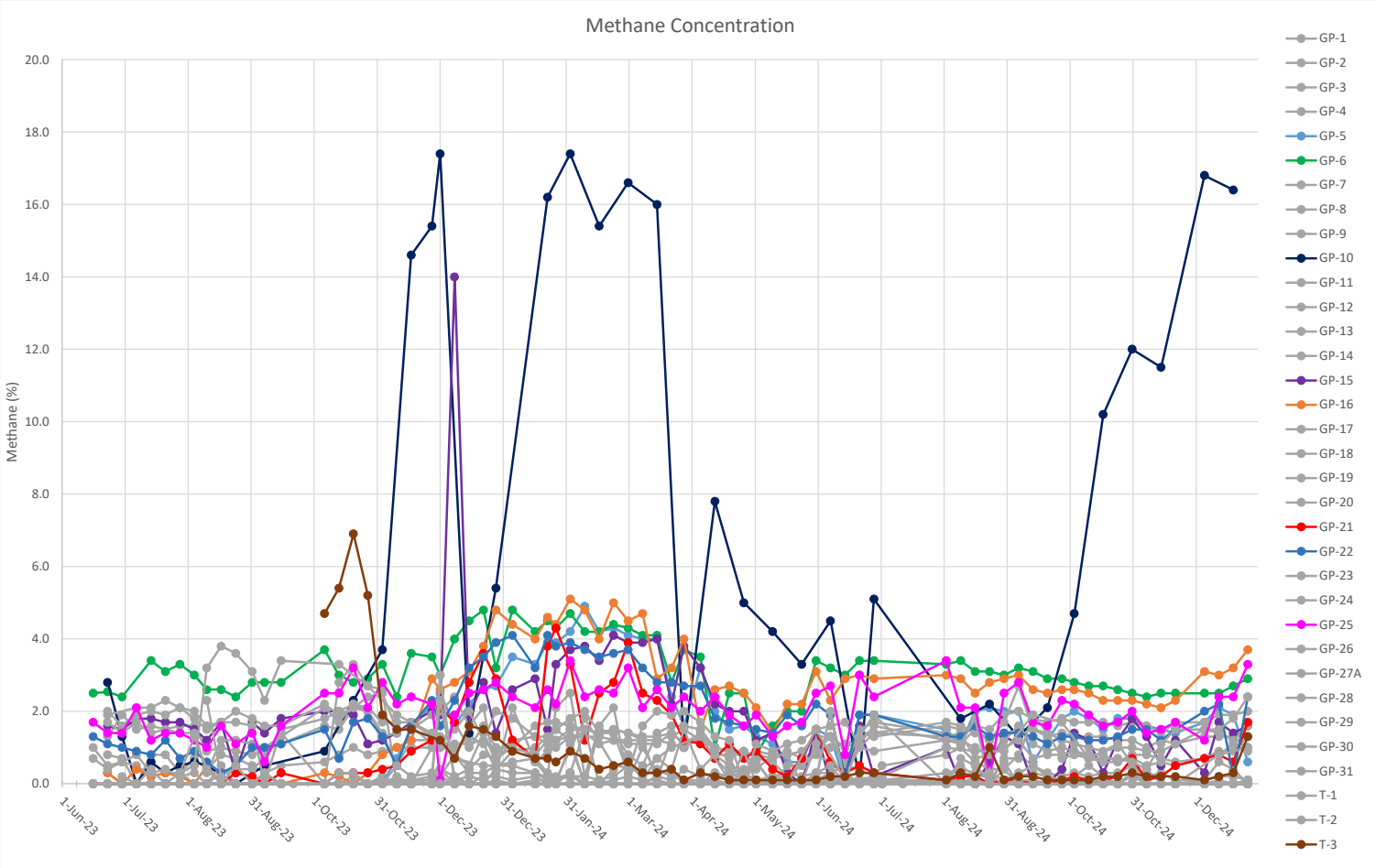
LEL for individual GP



Methane

Methane levels for most wells are converging between 0 and 4% indicating that landfill is not biologically active.

Only well GP-10 is indicating higher methane, now climbing to 12% methane. This well is at crest of landfill. Highest methane concentrations are typically observed at this well as it is affected by more recently placed waste that is still in process of decomposition.

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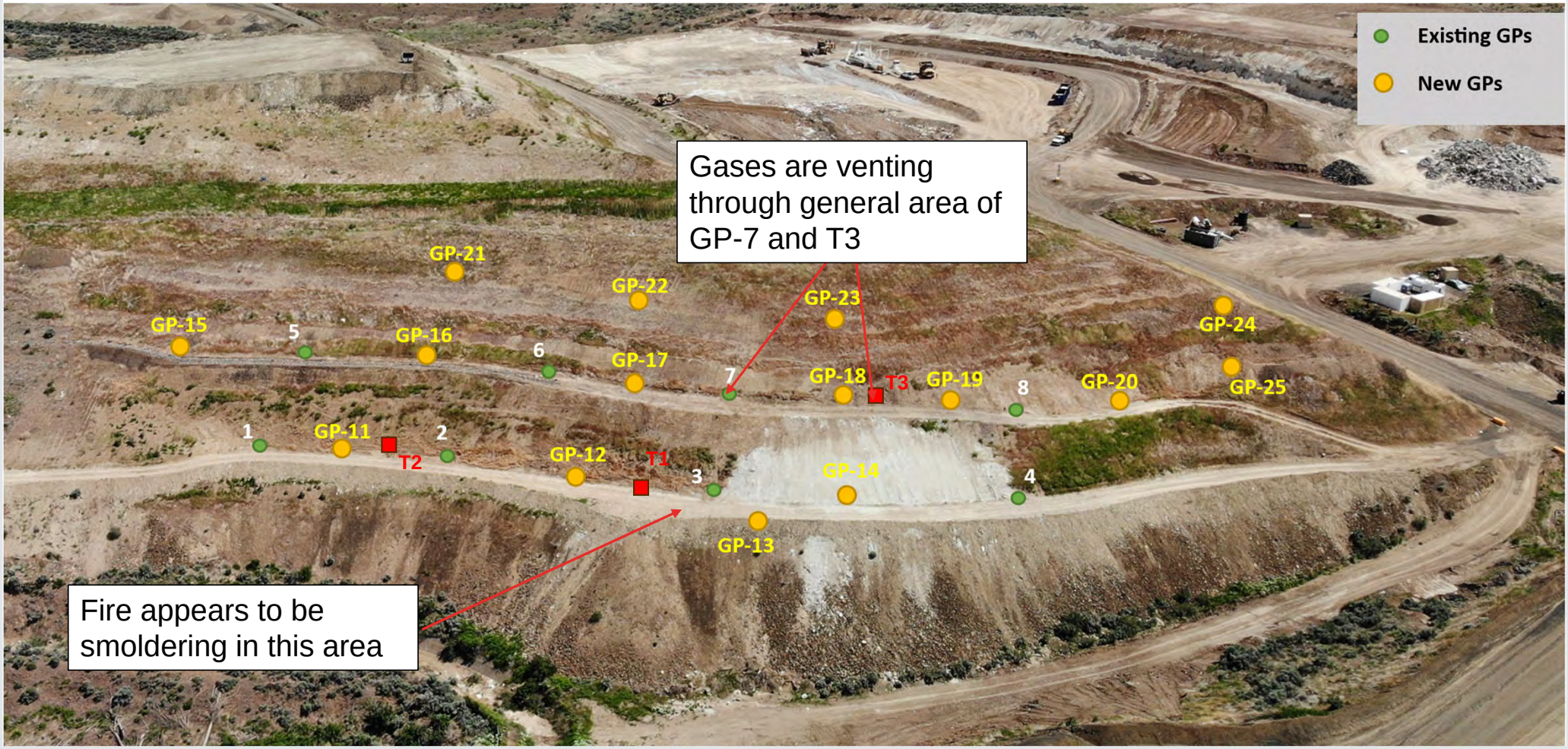
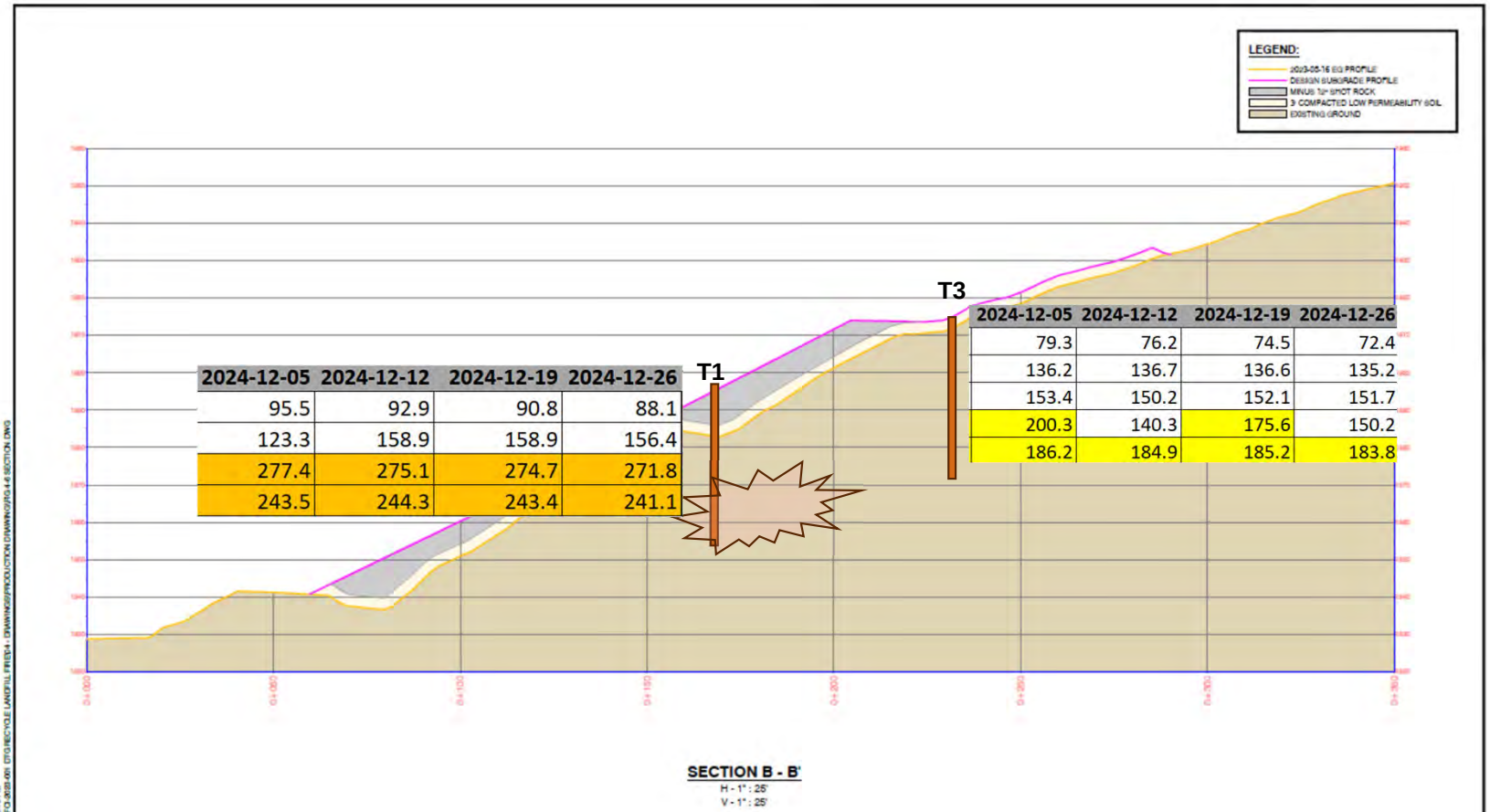
GP-10
GP-21
GP-22
GP-23
GP-24
GP-15
5
GP-16
6
GP-17
GP-18
GP-19
GP-20
GP-25
1
GP-11
2
T2
GP-12
T1
3
GP-14
4
GP-13
Existing GPs
New GPs

Fire Path


Existing GPs
New GPs
Gases are venting through general area of GP-7 and T3
Fire appears to be smoldering in this area
GP-21
GP-22
GP-23
GP-15
GP-16
GP-17
GP-18
GP-19
GP-20
GP-24
GP-25
GP-11
GP-12
GP-14
GP-13
T1
T2
T3
1
2
3
4
5
6
7
8



SECTION B - B'

H - 1" : 25'
V - 1" : 25'

SPERLING HANSEN ASSOCIATES

Landfill Services Group
- Landfill Siting
- Design & Operations Plans
- Landfill Closure
- Environmental Monitoring

#9 - 1205 Keith Road East
North Vancouver, B.C. V7J 1J3
Phone: (604) 986-7723

SEAL

No.	DATE (yy/mm/dd)	REVISIONS	DRAWN	CHKD	APP'D

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This drawing is not approved for construction unless it bears a signed and dated engineer's stamp, affixed on or after the date of the last revision.

CLIENT:

DESIGN BY:	T.SPERLING	SHA PROJECT #	2023-001
DRAWN BY:	A.TSANG	DATE CREATED:	8/16/2023
CHECKED BY:	T.SPERLING	HORIZONTAL SCALE:	1" = 25'
APPROVED BY:	–	VERTICAL SCALE:	1" = 25'

ADJUST SCALE 50% FOR 3+NSP SHEET

DTG RECYCLE LANDFILL FILE

SECTION B-B'

DRAWING NO.	REV	SHEET
2023-001-005	–	005

PDF GENERATED by: Alicja Tsang | 8/16/2023 10:15 PM
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Data Interpretation

LFCI believes that suppression efforts continue to work, but slowly. CO levels and temperatures have decreased dramatically since cover fill was placed. Temperatures continue to decrease, and CO has dramatically decreased over November.

In LFCI experience, CO has been best indicator of suppression at other landfill sites.

High O2 continues to fluctuate - this is likely due to large atmospheric pressure swings and pervious waste mass allowing entry of ambient air.

Temperature has dropped significantly all around, GP-3 continues to consistently fall.

LFCI believes that the waste continues to smolder underneath GP-3 and T-1 (elevated temperature) but the rate of smolder is steadily decreasing. Also, a ‘chimney’ effect is occurring, causing higher CO and VOC’s in T-3 and GP-7.

Other than slightly elevated CO in GP-20, there is no other evidence of fire or smolder in the zone south of T-1. In particular, no thermal anomaly has been detected. LFCI believes that with the placement of the soil wedge gas flow southward has become the preferred migration path for combustion gases from the smolder at T-1, resulting in elevated readings in GP-20.