

# Model of Liquid Generation and Total Quantity Report

Prepared For:



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January 7, 2026 Update

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January 7, 2026

Mr. Baitong Chen  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, California 91765

RE: Stipulated Order for Abatement, Case No. 6177-4, Conditions No. 12(g)(vii) and 12(g)(vii)(1)

In accordance with Condition No. 12(g)(vii) of the Stipulated Order for Abatement (Stipulated Order) with the South Coast Air Quality Management District (SCAQMD) in Case No. 6177-4, Blue Ridge Services Montana, Inc. (BRS) prepared a **MODEL OF LIQUID GENERATION AND TOTAL QUANTITY REPORT** on June 25, 2024. Per Condition No. 12(g)(vii), that initial report required the following:

The development of a model to estimate the rate of liquid generation in the landfill, and total quantity of liquid existing within the landfill waste mass at any given time (including supporting assumptions, references, and calculations). No later than June 25, 2024, the Respondent shall submit to the SCAQMD a report summarizing the model and results of modeling.

Subsequent to that initial report, the first semi-annual report was submitted to satisfy Condition No. 12(g)(vii)(1), which requires an update to the liquid generation model and a report submitted to the SCAQMD summarizing the updated model and results of modeling on a semi-annual basis beginning on January 7, 2025, and every six months thereafter.

This report, submitted on January 7, 2026, is the fourth report (the third semi-annual report) and it describes the updated model and results of modeling requested per the above-listed conditions.

Respectfully,

Neal Bolton, P.E.

President

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## ACRONYMS

Acronym	Meaning
<b>CY</b>	Cubic Yard
<b>CCL or “the Landfill”</b>	Chiquita Canyon Landfill
<b>EVOH</b>	Ethylene Vinyl Alcohol geomembrane used for cap
<b>LCRS</b>	Leachate Collection and Removal System
<b>LFG</b>	Landfill Gas
<b>MC</b>	Moisture Content
<b>MSW</b>	Municipal Solid Waste
<b>PCY</b>	Pounds per Cubic Yard
<b>SCAQMD</b>	South Coast Air Quality Management District

## EXECUTIVE SUMMARY

This report satisfies Condition No. 12(g)(vii)(1) of the Stipulated Order, which requires an update to the reports submitted on June 25, 2024, January 7, 2025, and July 7, 2025, and in accordance with Condition No. 12(g)(vii). Like the three previous reports, this updated report summarizes the results of a model that estimates the rate of liquid generation in the landfill and the quantity of liquid existing within the landfill waste mass. Similarly, this report provides supporting assumptions, references, and calculations used to update the model and present the results of our current liquids estimate.

Like the previous report submitted on July 7, 2025, this report includes not only entrained moisture but also includes an estimate of the quantity of additional *absorbed* moisture, along with moisture that has been trapped above low permeability layers of intermediate cover soil where it creates saturated zones. Beginning in 2022, and through November 2025, approximately 179.2 million gallons of liquid were extracted from the Chiquita Canyon Landfill (CCL or Landfill). During that same window of time, CCL's Leachate Collection and Removal System (LCRS) removed an additional 17.6 million gallons of leachate. In total, both sources have extracted approximately 196.8 million gallons of liquid from the Landfill.

Our updated modeling indicates there may be at least 107.7 million gallons of liquid yet to be removed from the area impacted by the reaction. Our updated estimate is based on a summation of the following three sources of liquid located within the Landfill, and incorporates recent settlement data as explained herein:

1. Initial entrained moisture of inbound waste;
2. Moisture that has been added to waste mass by infiltration; and
3. Saturated zones.

These three sources of moisture within the Landfill were assessed in the current model and are presented in this updated report.

Monthly leachate extraction quantities have continued to follow the pattern we expected through August 2025. Starting in September, the monthly rate increased significantly. To date, leachate extraction (excluding leachate removed by the LCRS) hit its highest point in November 2025, reaching approximately 11 million gallons that month (See Figure 1). October 2025 was slightly lower at 10.2

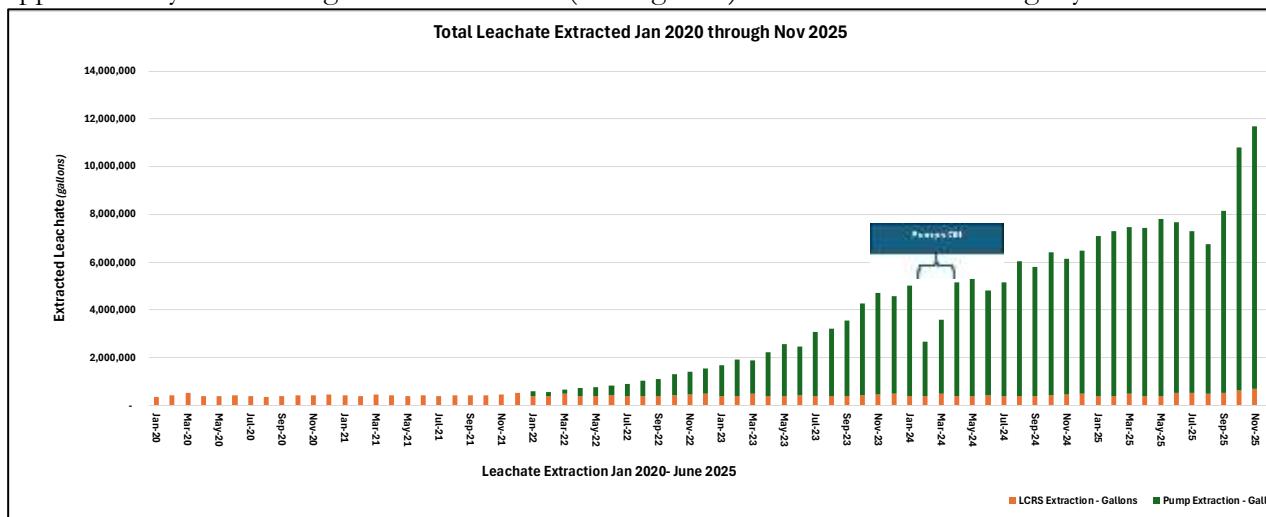


Figure 1 - Combined leachate removed from LCRS and pumps January 2020 through November 2025.

million gallons, also excluding leachate removed by the LCRS. As Chiquita Canyon, LLC (Chiquita) continues installing new pumps, which allows the site to extract more liquid, and with improved liquids-handling infrastructure, we expect leachate extraction rates will continue to increase. In the July 7, 2025 report, we stated our expectation that leachate removal rates would continue to increase through 2025 and that those rates would eventually stabilize. We still expect to see that pattern, although based on recent data, the increase may continue into 2026. It is important to note that significant liquids have already been liberated by the reaction. Liquid that is liberated from the waste mass is available for removal, but the number of pumps, and overall pumping capacity of the liquids removal system is a limiting factor.

The most recent data shows a significant increase in the leachate extraction rate, growing from approximately 8 million gallons per month to 11 million gallons in November 2025. Some of that increase appears to be directly related to precipitation events and more efficient pump production; however, we also believe this increase could be attributed to the flow meters over-reporting the amount of liquid that is extracted from the Landfill.<sup>1</sup> Finally, please note that significant impacts to the leachate removal effort were caused by portions of the system being down during installation of the new Ethylene Vinyl Alcohol (EVOH) geomembrane cover (the EVOH/HDPE geomembrane cover).<sup>2</sup>

Once the number of pumps stabilizes, the rate of extraction is also expected to stabilize, and eventually decline. However, this decline might be masked by certain operational practices, such as adding more pumps and lowering pump elevations inside well bores as liquid elevations decrease, both of which may serve to increase the rate of leachate extraction in the short term.

Please note that the rate of liquid extraction does not necessarily reflect the actual rate at which liquid is being liberated by the reaction. Although a large quantity of liquid has been liberated, the pump data is more indicative of the number and production rate of pumps that are in place and functioning at any given time.<sup>3</sup>

## INTRODUCTION

Per Condition No. 12(g)(vii) of the Stipulated Order, the South Coast Air Quality Management District (SCAQMD) required Chiquita to develop a model that accomplishes two objectives:

1. Estimates the volume of liquid within the waste mass of the Landfill, and
2. Estimates the generation (i.e., liberation) rate of liquid from that waste mass.

Per subsequent Condition No. 12(g)(vii)(1), the initial report was to be updated and submitted semi-annually, beginning on January 7, 2025. The first semi-annual report was submitted on January 7,

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<sup>1</sup> Chiquita described this over-reporting in its SOFA Condition 8 monthly reports submitted to SCAQMD for September, October, and November 2025, stating, “Chiquita is currently investigating potential over-reporting by the on-site flow meters which may be resulting in overestimating the amount of leachate extraction volumes. Chiquita is continuing to evaluate this issue and potential corrective actions.”

<sup>2</sup> When pumps were temporarily taken offline, leachate may have built up, and when put back online, the flow rate may have temporarily increased. Consequently, some variation in leachate extraction rates is to be expected.

<sup>3</sup> The July 7, 2025 report included isopach figures showing the elevation change of the liquid levels between months. This report does not include these figures in part because of having to disable equipment, including the Lorentz Pumps, while installing the EVOH/HDPE geomembrane cover. We expect to resume including these figures in the next report.

2025 and the second semi-annual report was submitted July 7, 2025. This report is the third semi-annual report to be produced under this condition.

The model described herein integrates several variables that were updated based on new information and data received since the submittal of the second semi-annual report on July 7, 2025. This updated information and data includes settlement, liquid levels, precipitation, and liquid volumes extracted from the Landfill. We concur with updating this model on a semi-annual basis, because the liquid volume and liberation rates are expected to change as the reaction wanes and as the waste mass surrounding the reaction continues to liberate liquid. Please note that, like the July 7, 2025 report, this third semi-annual report does not include any reference to additional inbound waste, because CCL stopped receiving outside waste on January 1, 2025.

## DEFINITIONS

### **LEACHATE**

Liquid exists within the Landfill as moisture that is held (i.e., entrained) within municipal solid waste (MSW) material as free liquid that is present in static perched zones in the form of layers of saturated waste and as free liquid that may be in the process of flowing through the waste.

Some “free liquid” exists within the waste mass of CCL. Waste, soil, and other materials within the Landfill also contain entrained moisture that, if liberated, may also become free liquid. In terms of scale, most of the liquid in any landfill, including CCL, is entrained in the waste. Some of this liquid may be liberated to become free liquid, but some moisture always remains entrained in the waste mass. The free liquid in a landfill is referred to as leachate.

When it comes to landfill leachate, and in the context of this model, we are assuming that leachate is any free liquid (or moisture) that has contacted waste.

Leachate may exist as it flows downward toward the liner where it is collected by the LCRS, or as it flows laterally toward a surface leachate seep. It may also exist as a saturated layer or “lens” within the waste mass.

This total liquid/moisture volume, along with liquid that is added in various ways, represents the total potential source of liquid generation. In this context, liquid generation refers to the rate at which free liquid is liberated within the waste mass. Liquid generation is discussed later in this document.

When discussing liquid and/or moisture volume within the Landfill, there are two important terms one must understand: saturation and field capacity. These terms are often confused and may mistakenly be used interchangeably, but they represent two related, but different, conditions that are discussed below.

### **SATURATION**

Saturation is when all the pore space within an object or material is filled with water. Suppose you placed a sponge into a bowl and then added water until the sponge was completely submerged. If you pressed on the submerged sponge – or patiently watched – you would observe air bubbles coming out of the sponge. After enough pressing and/or enough time, there would be no more bubbles, because all the pores within the sponge would be filled with water. At this point, the sponge would be saturated.

Items or materials within a landfill may become saturated if they are in an area where liquid has pooled or if excess water is unable to leave because it is in a confined area – it is compartmentalized. This concentration of liquid may occur on top of the landfill liner, a low-permeability layer of cover soil, an old access road, or another confining (i.e., limiting) layer within the landfill. Please note that this does not refer to a “lake” of liquid, but rather to a layer of waste that is at some degree of saturation.

Full or partial saturation may also occur if liquid is added to an object or material faster than it can drain out. To illustrate, if you continue pouring water on the sponge and do not allow time for it to naturally drain, it will continue to be at some degree of saturation. In other words, it is unable to drain and reach its field capacity.

## **FIELD CAPACITY**

We can think of field capacity as a point of equilibrium in terms of an item or material that has reached its maximum moisture holding capacity, though is not necessarily saturated. For example, if we removed a saturated sponge from a bowl and set it on a drying rack, water would drain from the sponge. After a while, no more water would drip from the sponge. However, if, at that point, we used an eye dropper to add a single drop of water to the sponge, a single drop of water would drop out the bottom. When the sponge has all the water it can hold and cannot retain even a single drop more, it is at field capacity. It may not be fully saturated, in that not all pores are filled with water, but still the sponge has all the water it can hold.

A similar state of equilibrium may exist within a landfill. However, it should be considered an equilibrium at a specific point in time. Because waste material is continually decomposing, settling, and changing state (from solid to liquid or gas), the equilibrium that defines field capacity is constantly changing. In the process, the quantity of moisture entrained in the waste or liberated as free liquid is changing too. This equilibrium is also affected by free liquid that may be held or that is passing through the waste mass.

## **SATURATED ZONE**

The well-drilling process has identified numerous saturated zones within the Landfill. Some of these saturated zones may be interconnected and others may be isolated. These zones are likely caused by the historic operational practice of not removing layers of daily and intermediate cover soil before placing subsequent layers of MSW. This practice occurred prior to Chiquita’s acquisition of the Landfill. Those low-permeability layers of soil may act as a quasi-liner, restricting the downward flow of leachate toward the landfill’s main LCRS. As leachate accumulates on those layers, the adjacent waste mass is impacted and becomes wetter.

## **REACTION AREA**

In this report, we refer to the “reaction area.” Please note there are two different reaction area boundaries (See Figure 2) as defined below.

### **DATA-DRIVEN REACTION AREA BOUNDARY**

This is the boundary that defines the limits of the Elevated Temperature Landfill (ETLF) conditions based on several criteria, including subsurface and wellhead temperature, leachate quantity, leachate characteristics, gas quantity, gas characteristics, and settlement, as required by Conditions 9(b) of the Stipulated Order. Under the supervision of the SCAQMD and in accordance with the Stipulated Order, a Reaction Committee was established and tasked with delineating the data-driven reaction

area boundary. The Reaction Committee evaluates data on an ongoing basis to make monthly reaction area determinations.

In September 2025, based on August 2025 data, the Reaction Committee adjusted the data-driven reaction area boundary approximately 25 feet to the north to encompass CV-24011. The September determination describes the reasons for that adjustment.

In November 2025, based on October 2025 data, the Reaction Committee further adjusted the data-driven boundary approximately 100 feet to the east to encompass wells CV-2333, CV-24126, and CV-25100S/D, and one temperature monitoring probe, TP-18. The November determination describes the reasons for that adjustment. That adjusted boundary is shown here (See Figure 2).

In the November 10, 2025 letter from the Reaction Committee re: Monthly Reaction Committee Determination on Reaction Area Boundary, the data-driven boundary was revised as shown here (See Figure 2).

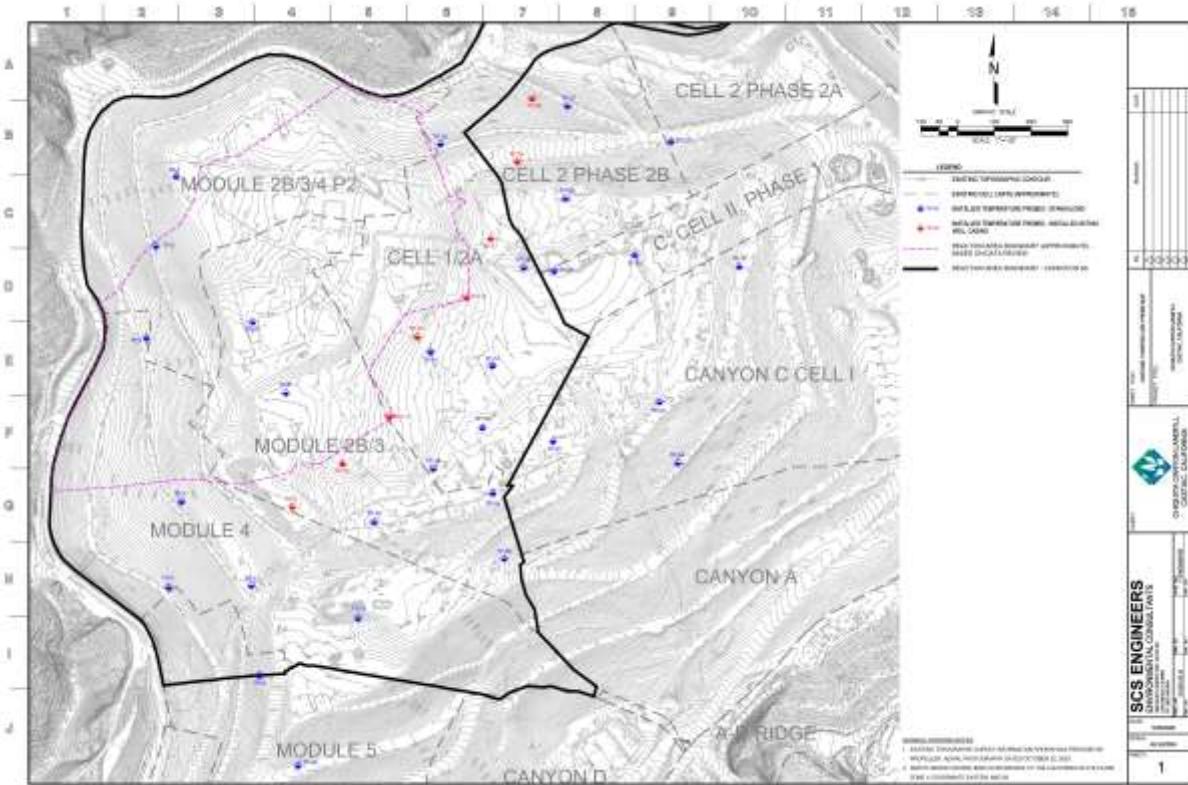


Figure 2 - Data-driven boundary revised per November 10, 2025 letter from Reaction Committee.

### SCAQMD REACTION AREA BOUNDARY

This is the boundary that the SCAQMD previously defined as the perimeter of the reaction area. This boundary was defined initially by the boundaries of Cells 1/2A, 2B/3, 4 and Module 2B/3/4 P2 of the Landfill.

## APPROACH

We utilized the same approach as was used in the previous (July 7, 2025) model by attempting to quantify infiltration moisture that has been absorbed into the Landfill's waste mass, along with liquid

that may be creating a saturated zone above a low permeability layer within the Landfill. Regarding that data, we modeled the quantity of liquid within the Landfill by estimating the overall moisture content within the waste mass and extrapolating from there the volume of moisture that could be liberated, as free liquid, from the moisture stored within the Landfill. Our estimate is based on a summation of the following three factors:

1. Initial entrained moisture of inbound waste;
2. Moisture that has been added to waste mass by infiltration; and
3. Saturated zones.

These three sources of moisture within the Landfill are included in the current model and explained in this updated report.

We estimated the ultimate (ending) moisture content (MC) of the waste mass – after decomposition – and then assumed that all liquid above that baseline is available to be liberated. We assume that the average ending MC, after decomposition, will be approximately 15%. That figure was assumed to apply to both categories of waste decomposition discussed below.

1. **Typical Decomposition** – Under what we consider to be typical conditions, moisture within the waste mass is liberated during the typical decomposition process to the point where the remaining entrained liquid represents a MC of approximately 15%. Under the arid conditions at CCL, complete decomposition, and the ultimate liberation of moisture down to that average level of 15% within the waste mass, would occur over many decades. The LCRS and gas collection systems were designed to effectively handle this relatively slow rate of decomposition.
2. **Reaction Decomposition** – Under ETLF conditions, moisture within the waste mass is liberated at a much faster rate. Nonetheless, we estimated that the ending MC after reaction decomposition will also be 15%.

Please note that this integrated model and the associated modeling results are based upon multiple layered assumptions. These assumptions may change as new data is collected, or if any assumptions are shown to be inaccurate, in which case the results of this model may change significantly. For this reason, along with the ever-present need for more data to confirm assumptions and analyses, we will continue to update this model and report those modeling results semi-annually. The next semi-annual report will be submitted on July 7, 2026.

## VOLUME OF LIQUID

We began our analysis by stating our base assumption that liquid (or moisture) within the landfill can neither be created nor destroyed. We recognize that some chemical bonding of hydrogen and oxygen may occur to produce water, but not on a scale that would significantly increase the volume of liquid or moisture within the waste mass.

We have also assumed any free liquid that has an uninterrupted path to the base of the Landfill will be collected by the underlying LCRS. This is the desired process, and the *pass-through* leachate does not add to the inventory of liquid stored within the Landfill.

Typically, liquid is liberated through the process of organic decomposition and does so at a somewhat predictable and relatively steady rate. Conversely, the ETLF reaction liberates liquid over a much shorter time.

As noted in the initial report, while various methods exist for measuring MC in soil, none can be accurately applied to the waste mass in a landfill so, our approach was to estimate the initial MC in the inbound waste stream. Then, we estimated the additional moisture that could be added by infiltration into the Landfill's waste mass.

As noted above, we identified the following three potential sources of moisture within the waste mass that include:

1. Initial entrained moisture of inbound waste;
2. Moisture that has been added to waste mass by infiltration; and
3. Saturated zones.

Each of these sources is explained in detail herein.

Through our experience and research, we determined that the most accurate method for estimating overall MC within CCL's waste mass is to apply industry-typical MC factors to various types of solid waste and then modify them based on site-specific assumptions. Those site-specific assumptions address entrained moisture, absorbed moisture, and liquid stored in saturated zones, mostly above low permeability layers of intermediate cover soil.

## **ENTRAINED MOISTURE**

We first estimated the overall MC by applying industry-typical MC factors to the categories of solid waste that can be found in CCL's waste mass.

To estimate the total liquid volume within CCL's waste mass, we estimated the total volume of *entrained* moisture within the waste. Remember, entrained moisture within the waste can only become liquid (i.e., leachate) if it is liberated during the decomposition process.

We began our estimation of entrained moisture by analyzing CCL's most recent 15 years of inbound tonnage data and subdividing it by type of waste material. We then applied typical MC to those waste categories.

In addition to the moisture that is entrained in the Landfill's waste mass and present in the saturated zones, some moisture is continually added to the Landfill, mostly from infiltration of stormwater.

This added moisture should continue to be considered when updating the model to show future leachate volumes. We can also continue to make updated estimates of future liquid volumes as moisture is liberated to become free liquid (i.e., leachate).

To estimate the quantity of absorbed moisture, we performed a run of the HELP model. HELP is an acronym for, "Hydrologic Evaluation of Landfill Performance." The HELP model was developed by the U.S. Army Corps of Engineers for the U.S. Environmental Protection Agency. It has been widely used to estimate leachate generation rates for various types of final cover designs for closed landfills.

Through this process, we estimated that, on average, every ton – and every cubic yard – of fill within CCL's waste mass contains approximately 46.37 gallons of entrained moisture. Within the area of settlement, we estimated that entrained moisture from the initial MC of the inbound waste represents

905,888,887<sup>4</sup> gallons. The amount of entrained moisture has increased since the previous report because there has been additional settlement. See Section on Settlement for a more detailed explanation of this change in settlement.

## **ADDED MOISTURE**

We also considered the additional moisture that was added due to infiltration through the soil cover and into the waste mass during the wet season. Rainfall that does not run off or that is not stored in the topmost layer of daily or intermediate cover – and later released through evapotranspiration – will percolate into the Landfill. Some of this percolated liquid will be stored (i.e., entrained) within the waste mass. This is the well-known sponge-effect of solid waste landfills and is based on the relatively high field capacity of MSW.

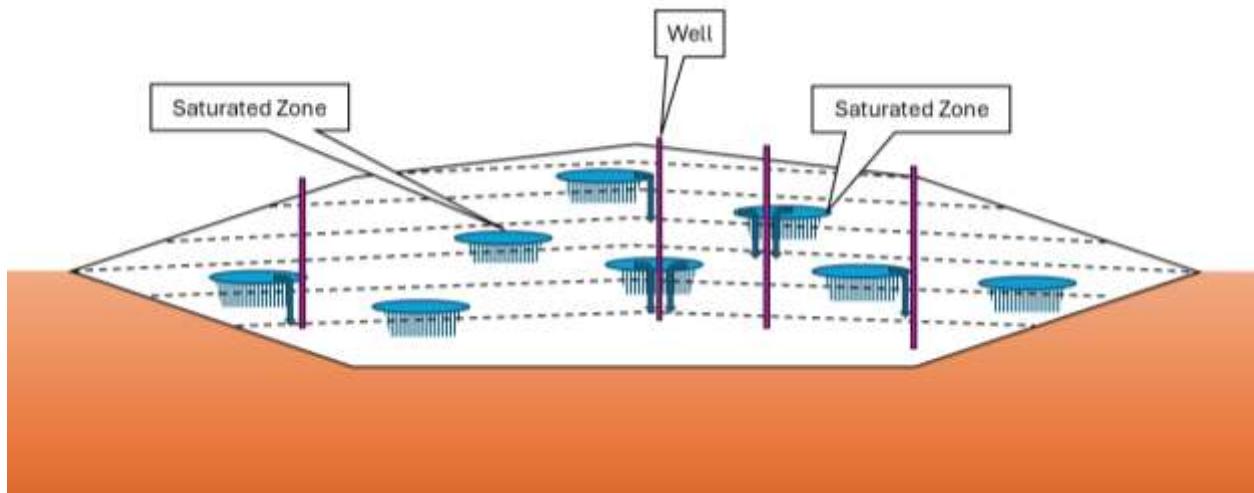


Figure 3 - Saturated Zones

We estimated that the waste mass in the area impacted by the reaction has stored an additional 8,610,685 gallons of liquid added due to infiltration. This estimated amount has not changed since we submitted the January 7, 2025 report.

## **SATURATED ZONES**

Free liquid that is not absorbed within the waste mass will flow downward within the Landfill until it reaches the base liner and is removed by the LCRS. However, the presence of saturated zones at the Landfill suggests that much of that free liquid may be stored on top of low permeability layers of intermediate cover soil (See Figure 3). Numerous saturated zones have been encountered during well-drilling operations – which seems to corroborate this assumption.

We estimated in the prior report that the saturated zones represent approximately 95,262,326 gallons within the area impacted by the reaction.

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<sup>4</sup> Please note that to prevent confusion between various numbers, and to allow the reader to track values accurately, we have opted to show the entire number rather than using the traditional protocol of rounding the number.

Much of the liquid in those saturated zones is being pumped and extracted out of the Landfill by a series of pumps located across the Landfill, and which are most densely spaced in and around the reaction area. In fact, it is only the liquid from those saturated zones that can be pumped and extracted. All other liquids are entrained or passing through as they move downward toward the LCRS.

The liquid from the Landfill's saturated zones may be moving laterally above layers of intermediate cover soil, or it may be moving downward as it slowly seeps through a soil layer. The liquid may also be migrating downward through a vertical well, until it reaches another low permeability layer. Finally, the liquid may reach the bottom of the Landfill where it can be extracted via the LCRS.

In some cases, if the liquid is under pressure due to being heated, is affected by LFG pressure, or is loaded by the weight of the overlying waste mass, the liquid may move upward through layers within the Landfill or within a vertical well. But most often, the liquid will move downward or laterally within the Landfill. LFG, on the other hand, will move in any direction following the path of least resistance (See Figures 4 and 5).

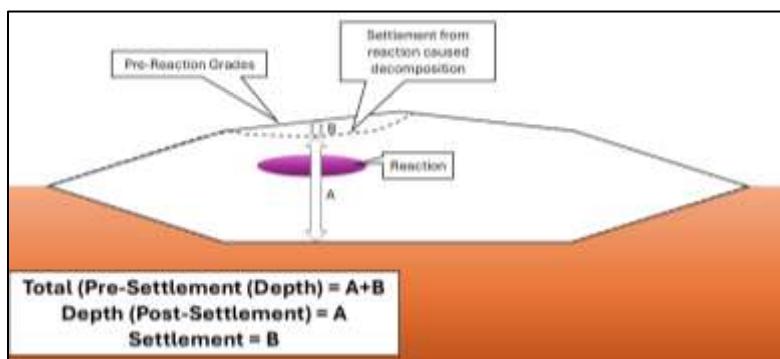


Figure 4 - Schematic of Settlement above Reaction Core

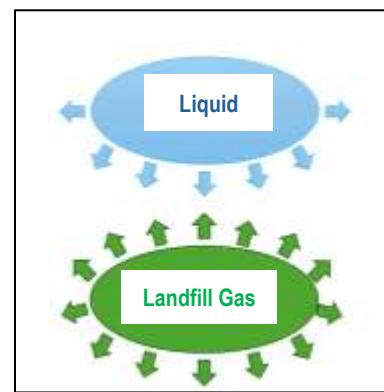


Figure 5 - Movement of Gas & Leachate

## LANDFILL SETTLEMENT

Research and our experience indicate that a typical landfill may ultimately settle 20% of its initial depth, due to physical, chemical, biological, and mechanical factors – mostly related to decomposition of organic matter. At best, landfill settlement is a complex process.

ETLF conditions can result in portions of a landfill settling very quickly (See Figure 6). Settlement continues within the area of the reaction. We have maintained the same assumptions used in the previous report, as related to settlement, except for the change in the amount of settlement, as discussed in the Section on Settlement.

These assumptions are:

1. Waste stream characterization data suggests that 55% of CCL's inbound waste mass is organic. This is the only portion that will undergo decomposition.
2. During operational activities, additional landfill airspace is filled with cover soil, further reducing the average percentage of organic material, within the waste mass, that can be decomposed.
3. Further, the organic portion of the waste mass is, under typical landfill conditions, unlikely to fully decompose.
4. Under ETLF conditions, organics are decomposing very quickly and have been observed to be a wet sludge, described as “oatmeal” by the drillers, contractors, and operations staff. We are estimating that as the organics within the landfill transform to oatmeal, they undergo a 60% volume reduction. Accordingly, every cubic yard of organic material placed in the landfill would, after decomposition, occupy only 0.4 cy under ETLF conditions within and adjacent to the reaction.
5. In the previous report (July 7, 2025) we reported that a total of 1,227,060 cy of settlement had occurred since May 18, 2023. An additional 199,796 cy of settlement has occurred during the intervening 6-month period, through December 17, 2025. This shows a significant reduction in the rate of settlement from the 284,996 cy during the 6-month period as reported in the July 7, 2025 report. This reduction in the rate of settlement is in line with the findings of our settlement analysis report that showed the rate of settlement to be slowing. Our settlement report is attached hereto as Exhibit 1. The latest settlement figures bring the total settlement

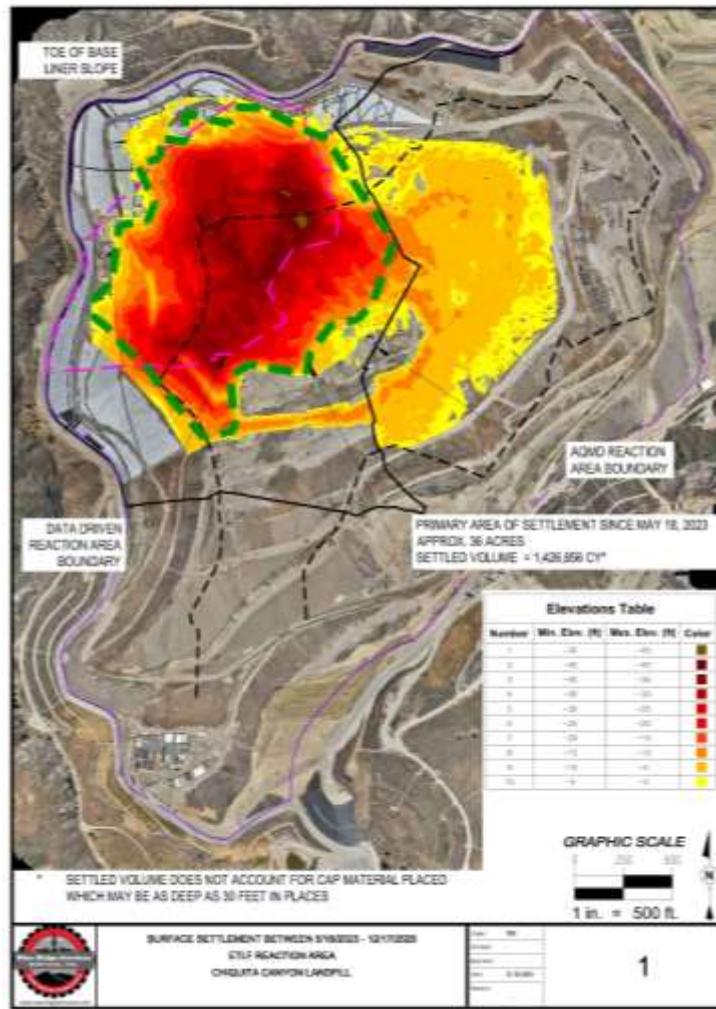


Figure 6 - Settlement

from May 18, 2023 to 1,426,856 cy (See Figure 6 on previous page). This amount is conservative because it does not include the soil that was placed on settled areas to maintain positive drainage, repair soil stress cracks, etc. The periodic settlement calculated for each of these semi-annual reports shows that the rate of settlement is decreasing – in agreement with the findings of the settlement report in Exhibit 1 (See Figure 7). Please note that the first column represents settlement over approximately 13 months and is likely understated because of the massive volume of soil that was initially placed on settled portions of the reaction area.

6. Based on the 1,426,856 cy of settlement we could measure (the effect), we calculated that approximately 5,765,075 cy of material had been directly affected by the reaction (the cause). We estimated the approximate volume of landfill mass affected by the reaction, by the equation:

$$WMVi = \frac{\text{Settlement}}{ORG \times VR \times (cy \text{ waste} \div (cy \text{ cover soil} + cy \text{ waste}))}$$

Where:

WMVi = Initial Waste Mass Volume

ORG = Organic (decomposable) Portion of Waste Mass = 55%

VR = Volume Reduction under ETLF Conditions = 60%

CR = Cover Ratio Factor (waste volume: cover soil volume) = 3:1 = 0.75 waste

Settlement = Measured Cumulative Settlement in and adjacent to Reaction Area = 1,426,856 cy

$$5,765,075 \text{ cy} = \frac{1,426,856 \text{ cy}}{55\% \times 60\% \times (3 \div 4)}$$

This rapid decomposition has clearly liberated significant additional amounts of liquid and LFG. We also believe that a significant quantity of liquid still exists as free liquid within the landfill waste mass.

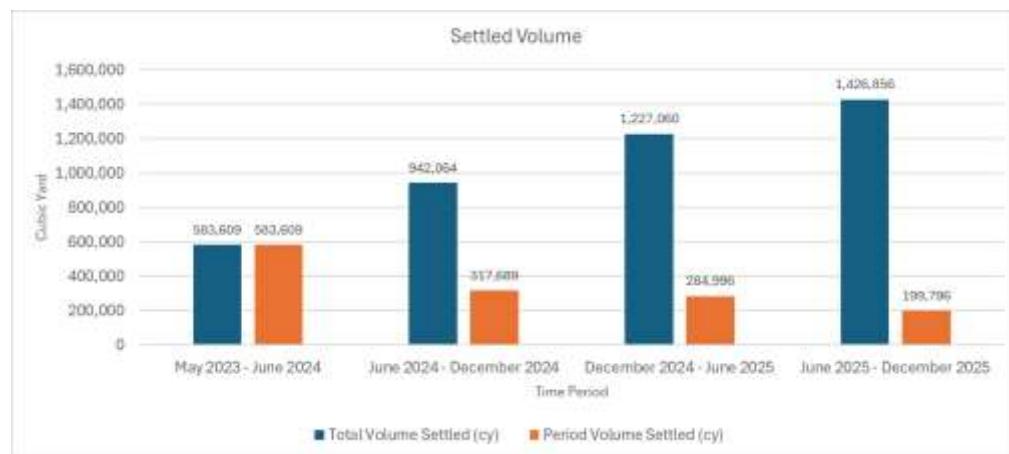


Figure 7 - Settlement for each semi-annual report.

## **VOLUME OF LIQUID SUMMARY**

The HELP model is not specifically designed for estimating operational leachate volumes, nor did we base our estimates solely on the results of the HELP modeling. However, we believe it provided one more reference point in our estimation of liquid volumes within the Landfill. Our estimate of absorbed moisture and liquid in saturated zones was in part based on the HELP modeling using operational conditions, including the presence of intermediate cover soil on the landfill surface.

During the operational phase, it is anticipated that greater quantities of liquid will enter the Landfill through infiltration than would be expected after closure, when the final cover system has been placed. However, this is not true for much of the data-driven reaction boundary because of the geosynthetic cover that is in place and is being extended. The geosynthetic cover eliminates infiltration in this area.

Our modeling indicates that 5,765,075 cy of material within the Landfill reacted or was impacted by the temperature, liquid, or gas movement relating to the reaction, resulting in 1,426,856 cy of settlement. See the section on Settlement within this report for a more detailed explanation. We also estimated that approximately two times that volume of material has also been impacted by some level of heat and the transfer of LFG and leachate from the reaction. This combined total area impacted by the reaction represents approximately 17,295,225 cy of material. This increase is up from the value of the previous report (July 7, 2025) which should have been 14,872374 cy, but which was mis-stated as 11,418,957 cy (mistakenly left in from the January 7, 2025 report). Within that volume of affected material, we suggest there are 905,888,887 gallons of liquid. Of that, we roughly estimate that perhaps 618,996,076 gallons will be retained after decomposition.

That means at least 286,892,811 gallons could potentially be liberated. This amount is in addition to the baseline leachate extraction amount that is typically handled through the LCRS, which serves the entire Landfill. Leachate removal records indicate that through November 2025, CCL has extracted 179,196,719 gallons of leachate above the historic baseline of approximately 5 million gallons per year, leaving an estimated 107,696,092 gallons of liquid that still may be liberated and removed.

As previously noted, we expect the removal of this liberated liquid may take several years. Based on the most recent extraction rates and continued increases in the number and production of pumps and expanded infrastructure, we have amended our estimate to reflect that 2026 will likely see the peak of liquid extraction.

## **LIQUID GENERATION RATE**

The second part of this model calculates the estimated rate at which liquid is being liberated within the Landfill's waste mass. As previously noted, some moisture is present in waste, soil, and other materials within the Landfill. In some cases, that moisture may be retained in those materials until they reach their respective field capacity. When entrained moisture is liberated into a "free liquid" within the waste mass, it becomes *leachate*.

## **LEACHATE THROUGH THE LCRS**

Pumping data from 2020 and 2021 establishes a good baseline for leachate generation. In the initial report, we assumed that historically, leachate extraction equaled liquid liberation. Accordingly, we assumed that because the LCRS was extracting an average of 416,825 gallons per month (See Figure 8), or approximately 5,001,901 gallons per year, that was also the amount of leachate the Landfill was liberating. In this updated model, and as stated in our January 7, 2025, and July 7, 2025 report, we

## Model of Liquid Generation and Total Quantity Report – Chiquita Canyon Landfill

have modified that assumption. Like in our previous reports, we continue to suggest that liberation from within the Landfill's waste mass exceeded what was being extracted by the LCRS. That excess leachate was added to the entrained moisture within the waste mass and was stored in the form of saturated zones caused by the historic practice (prior to Chiquita's acquisition of the Landfill) of not removing layers of cover soil to allow for uniform flow of leachate and LFG. This has been verified anecdotally by the presence of saturated zones encountered during drilling operations.

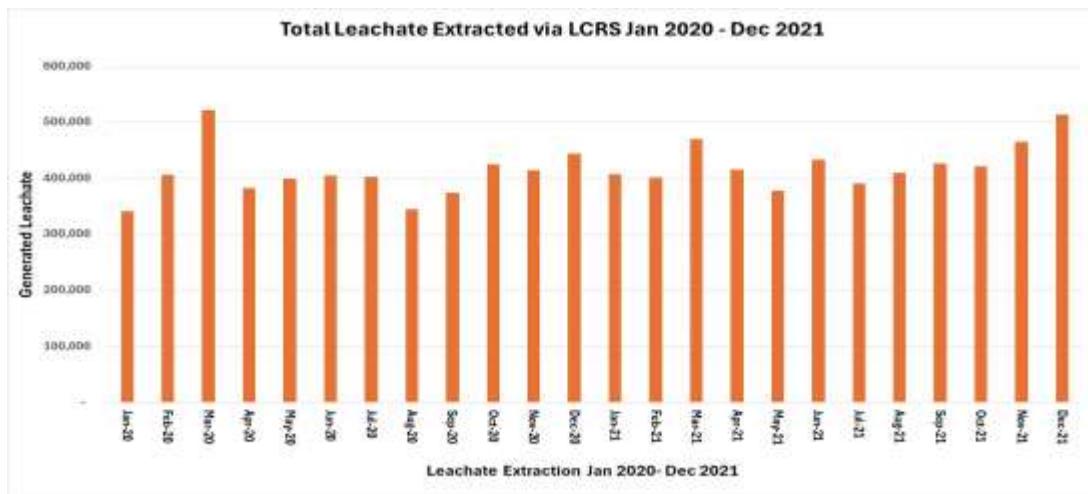


Figure 8 - Historic typical quantity of leachate removed through the LCRS.

## Model of Liquid Generation and Total Quantity Report – Chiquita Canyon Landfill

In January 2022, the leachate removal rate began to increase above the historic LCRS baseline (See Figure 8). In the following 12-18 months, leachate extraction quantities increased exponentially, except for 2 months (February and March 2024) when the pumps were temporarily shut down. By mid-2024, the rate of increase had slowed, though leachate volumes were still increasing. The liquid extraction rates have been impacted in part due to limitations in pump and infrastructure capacity to handle the extracted leachate. Improvements are ongoing and more pumps were installed and became operational in 2025.

The slowing in the rate of leachate extraction continued through August 2025, when extraction rates dropped to 6,243,567 gallons.<sup>5</sup> Then, starting in September 2025, extraction rates began a steep increase. Following this trend, leachate extraction hit its highest point in 11,006,635 (excluding LCRS leachate), in November 2025. If we include the LCRS quantities, 11,685,815 gallons were extracted

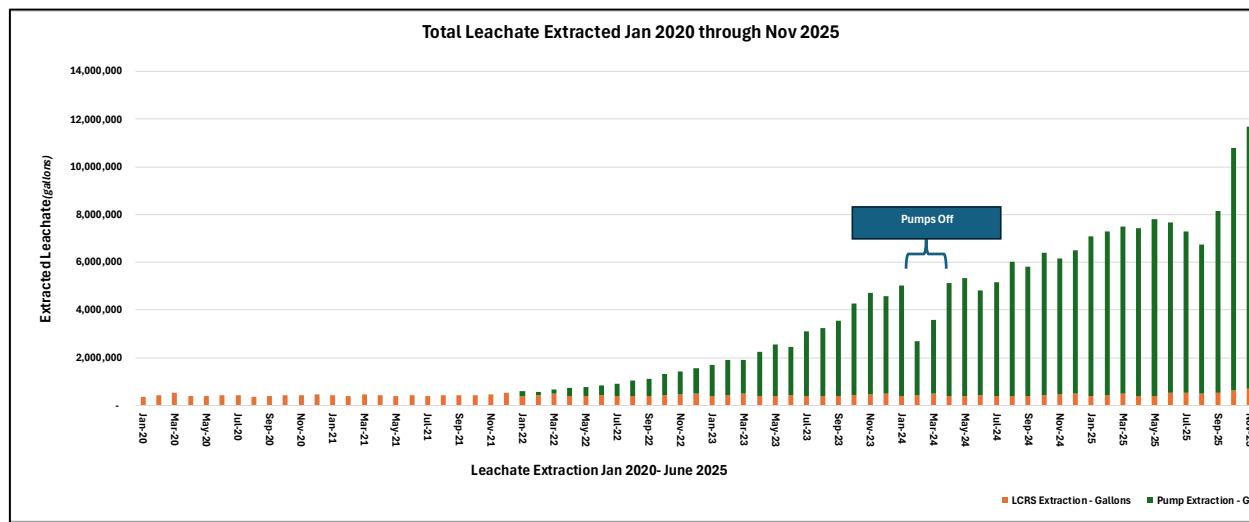


Figure 9 - Leachate removal per month January 2020 - June 2025.

in November 2025 (See Figure 9). We believe this variation in monthly leachate extraction is related to portions of the leachate pumping system being down during installation of the cap as explained in the Executive Summary.

We did not include isopach maps or specific analyses of liquid levels like those included in the July 7, 2025 report because several pumps were offline during this more recent period due to installation of the EVOH/HDPE geomembrane cover. When we attempted to create those isopach maps, significant gaps in the data rendered them meaningless. We intend to include liquid level analyses and isopach maps in the next report. Additionally, we believe much of the apparent increase in leachate extraction rates may be related to potential over-reporting by the on-site flow meters, which is highlighted in the Condition 8 reports submitted by Chiquita on a monthly basis. We understand that Chiquita is actively investigating this issue.

<sup>5</sup> Some of the decrease in the rate of leachate extraction likely results from pumps being offline during installation of the EVOH/HDPE geomembrane cover.

## Model of Liquid Generation and Total Quantity Report – Chiquita Canyon Landfill

The increase could also potentially be attributed to the precipitation the Landfill received in October and November 2025. Figure 10 shows leachate extraction values from the East Perimeter, Group A, and Total Extraction, in comparison to the amount of precipitation. These data show a clear correlation between precipitation and the East Perimeter, where leachate volumes increased approximately 1.5 million gallons. The increase from the East Perimeter, which appears to be directly related to precipitation, represents nearly half of the overall increase in leachate extraction. Conversely, there is no apparent correlation between the Group A area and precipitation, which is logical, considering that much of the Group A area is capped with a geomembrane.

Any remaining increase may be due to increased pump production within the Group A and Group B areas.

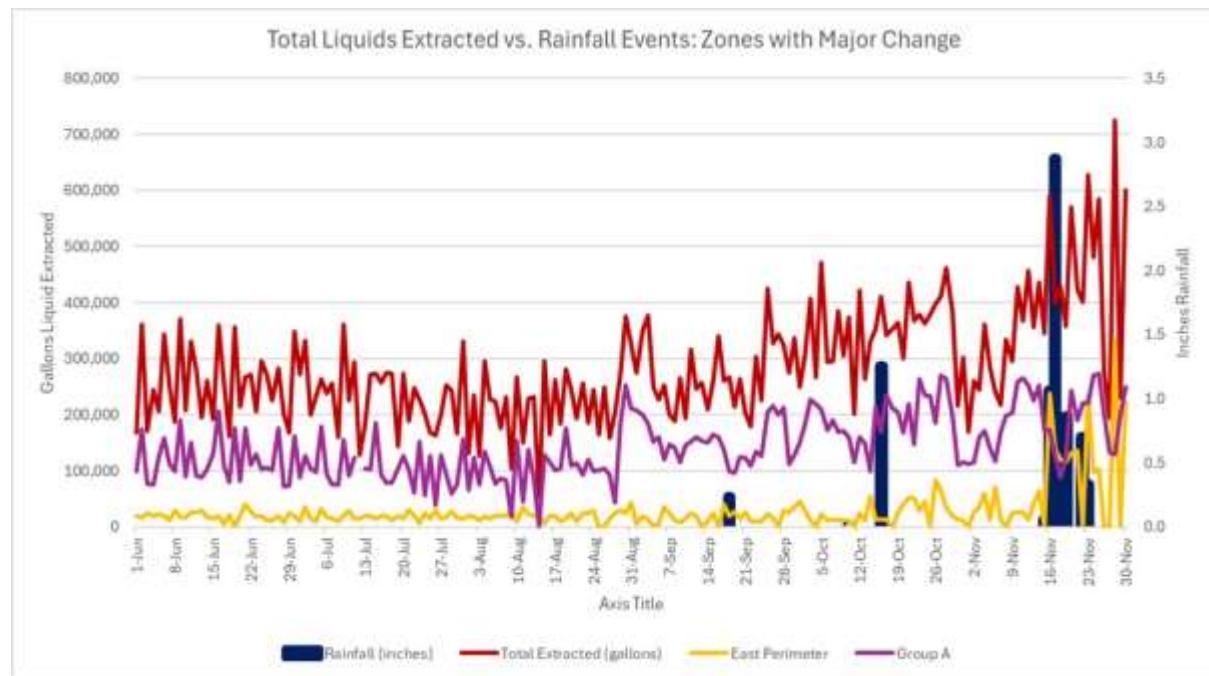


Figure 10 - Leachate Extraction Rates vs. Precipitation Jun-Nov 2025

## SUMMARY

The most recent data, as set forth in this report, indicates that there are 905,888,887 gallons of liquid within the reaction area and the impacted waste mass around the reaction. Of that, we estimate that perhaps 618,996,076 gallons will be retained after decomposition.

That means at least 286,892,811 gallons could potentially be liberated. This amount is in addition to the baseline leachate extraction amount that is typically handled through the LCRS, which serves the entire landfill. Leachate removal records indicate that through November 2025, CCL has extracted 179,196,719 gallons of leachate above the historic baseline of approximately 5 million gallons per year.

Accounting for the additional moisture that has been released from the slowing reaction since the previous report, and the quantity that has been removed through November 2025, we expect the removal of the remaining 107,696,092 gallons of liberated liquid from in and around the reaction area may take several years. Based on the most recent extraction rates and continued increases in the number and production of pumps and expanded infrastructure, we have amended our estimate to reflect that 2026 will likely see the peak of liquid extraction.

The accuracy of the model, in terms of tracking the liquid generation rate, will improve as additional site data is obtained. Of specific value will be additional well logs, liquid levels, and spatial data within and adjacent to the reaction area, particularly from the Lorentz pumps.

The above-listed data should be monitored over time to determine whether these liquid generation rate variables (i.e., settlement, leachate volumes, etc.) have indeed peaked and continue to decline. We believe that semi-annual updates are sufficient to track and report those changes.

**Exhibit 1**

# Evaluation of Reaction Caused Surface Settlement:

May 18, 2023, through  
May 21, 2025

Prepared For:



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*September 15, 2025*

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## ACRONYMS

Acronym	Meaning
<b>AQMD</b>	South Coast Air Quality Management District
<b>BRS</b>	Blue Ridge Services Montana, Inc.
<b>CCL</b>	Chiquita Canyon Landfill
<b>ETLF</b>	Elevated Temperature Landfill
<b>GCCS</b>	Gas Collection and Control System
<b>LFG</b>	Landfill Gas
<b>MSW</b>	Municipal Solid Waste
<b>RA-AQMD</b>	Reaction Area as defined by AQMD
<b>RA-Data</b>	Reaction Area as defined by Reaction Committee using Data
<b>SEM</b>	Surface Emission Monitoring for Landfill Gas

## BACKGROUND

The Chiquita Canyon Landfill (CCL or Landfill) is a municipal solid waste (MSW) landfill located in northern Los Angeles County. A portion of the Landfill is experiencing a subsurface reaction also known as an Elevated Temperature Landfill (ETLF) event. While all landfills experience surface settlement due to normal decomposition of waste, ETLF events cause accelerated decomposition often resulting in increases to a landfill's settlement rate, heat generation, and liquid levels.

Chiquita continues to diligently monitor the status of the reaction, particularly in terms of its location and whether it is expanding laterally. Simultaneously, CCL continues its efforts to mitigate the effects of the ETLF event, by extracting landfill gas (LFG) and leachate from within and around the RA-Data at unprecedented rates.

While there are many criteria used to delineate the physical boundary of the reaction, this Surface Settlement Study addresses one of them – settlement.

This Surface Settlement Study was conducted by Blue Ridge Services Montana, Inc. (BRS), under the direction of Neal Bolton, P.E. Mr. Bolton is president of Blue Ridge Services Montana, Inc. (BRS) and is a national expert in landfill operations. He serves on the Reaction Committee as the subject matter expert in landfill design and operational best management practices pursuant to Condition No. 12(a)(i) of the Stipulated Order for Abatement with the South Coast Air Quality Management District (AQMD) in Case No. 6177-4 (SOFA). He has provided various consulting support to Chiquita since 2020, including being part of the consulting team that resolved the working face odor issue in 2022. Additionally, he has broad operational experience within the heavy construction and solid waste industry that spans more than 47 years, during which time he has provided operational support for more than 500 landfills throughout North America and abroad.

## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

In this report, BRS analyzed surface settlement at CCL over a 2-year period between May 18, 2023, and May 21, 2025. The start date of May 18, 2023, was chosen because that date was the earliest date with Propeller<sup>1</sup> drone mapping data where no MSW fill activity occurred within the RA-Data of the Landfill. All subsequent fill activity was limited to reaction mitigation efforts involving the placement of cover material, re-grading, material stockpiling, and localized construction.

## EXECUTIVE SUMMARY

There were two primary goals of this study. The first was to identify areas of accelerated settlement that can be directly attributed to the ETLF event. The second was to quantify the rate of change of settlement to ascertain if the reaction is accelerating or decelerating vertically and/or laterally - and if so in what direction(s).

The results of this settlement study indicate that the reaction is slowing. Initially, in early 2023, the rate of change in terms of settlement was increasing – it was accelerating. This acceleration was a clear and obvious indicator that the subsurface reaction was occurring. At its peak, settlement within the RA-Data was occurring at an annualized rate of nearly 8% per year. Please note that we have expressed this at an annual rate, even though the period of peak acceleration lasted only a few months.

The location of the rapidly accelerating settlement was first observed within the eastern third of the current RA-Data as defined by the Reaction Committee. This acceleration is shown by the areas outlined by the blue line in the following three isopach's (See Figure 1). This shows the accelerated

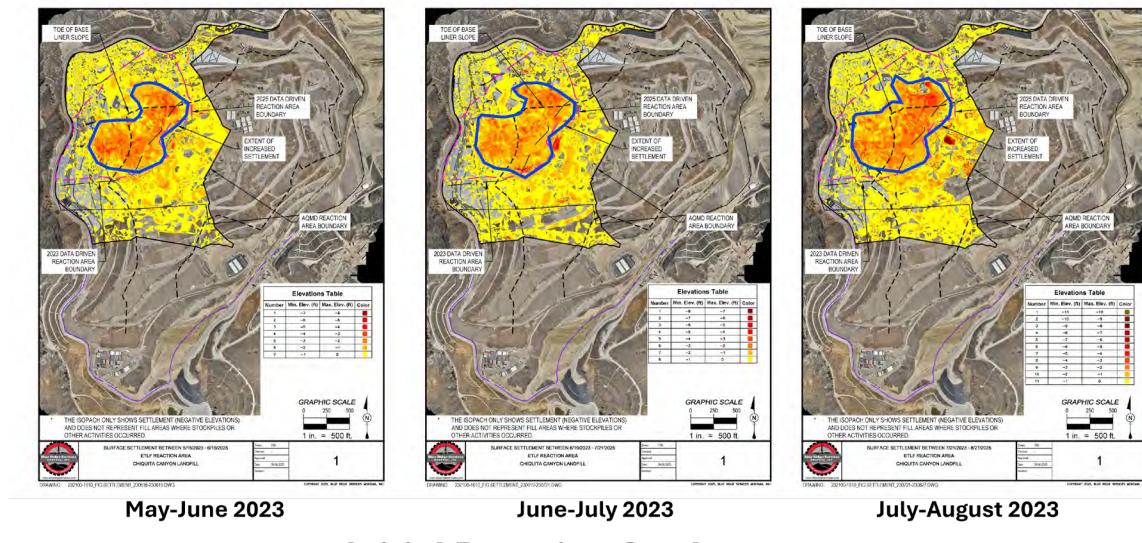


Figure 1

<sup>1</sup> Propeller is a third-party service provider of onsite drone mapping equipment and software. CCL utilizes Propeller to provide high quality topographic mapping of the Landfill's surface on an as-needed basis.

## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

settlement that occurred during the first three months from the start of our 2-year analysis. This appears to show the general starting area of the reaction.

As seen in Figure 1, the reaction was progressively expanding mostly to the west and northwest. This was supported by field evidence of high liquid levels, elevated temperatures, and general highly decomposed waste characteristics observed in drilling spoils and material excavated during the West Toe Project and the North Slope Termination Project.

While the rate of change of settlement across the northwest portion of CCL increased above baseline, the highest rate of change occurred within the red-shaded RA-Data boundary. Accelerated settlement rates were also observed in the adjacent area within the tan-shaded AQMD defined reaction area (RA-AQMD), but the rates were not as high as within RA-Data (See Figure 2). For reference, these two areas, along with the non-reaction area green-shaded area.

Our settlement analysis indicates that areas adjacent to the RA-Data boundary also showed increased settlement due to collateral impacts of the reaction.

These collateral impacts include the lateral migration of heat, LFG, and leachate that is being generated by the reaction. However, the rate of settlement in those adjacent areas is much less than was observed within the RA-Data. Accordingly, it is important to note that while above normal settlement is still occurring within and adjacent to the RA-Data boundary, the rate of change over time is slowing – it is decelerating.

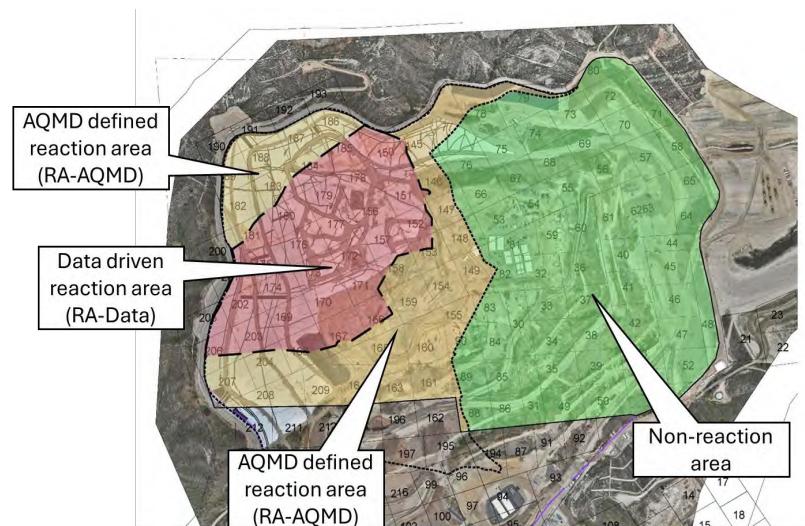


Figure 2

## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

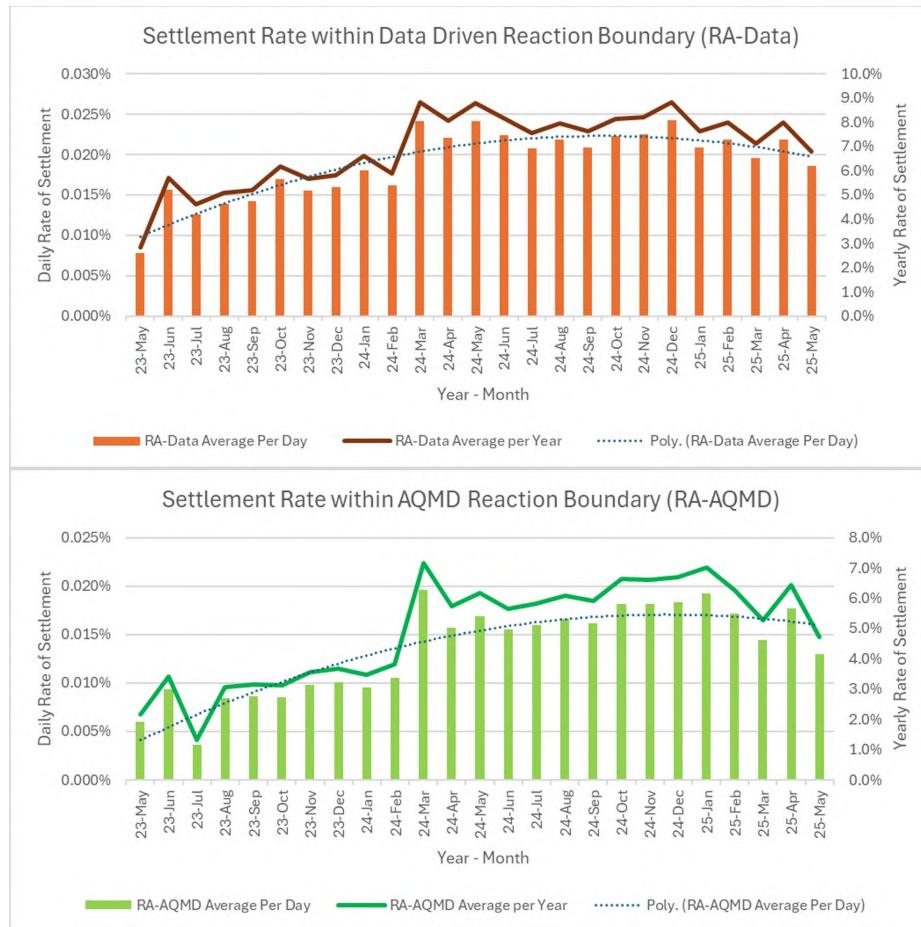
These charts (See Figure 3) show the average annualized rate of change of settlement within the RA-Data and RA-AQMD respectively (See the right-hand vertical axis on each chart). The months with the highest rate of change within RA-Data were March 2024 and December 2024 when annualized settlement approached 8%.

As simply a point of reference, both charts show the daily rate of settlement and the annualized – or yearly – rate of settlement.

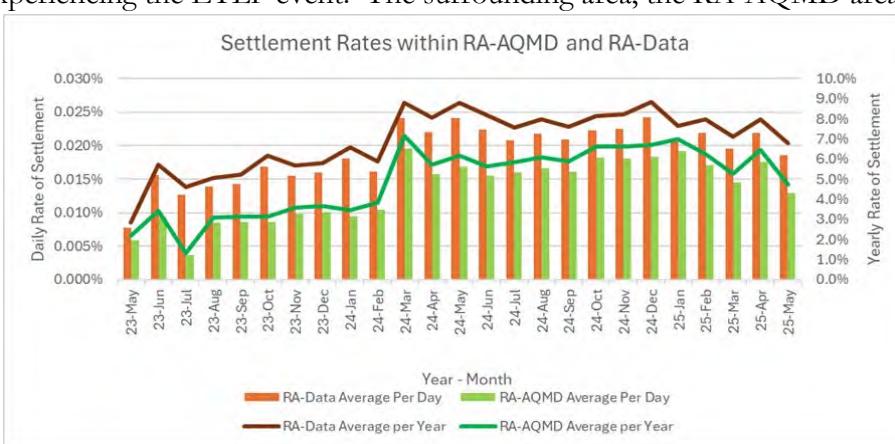
It is important to note the trendline for the changing rate of settlement. In both cases, the trendline reached its peak in September 2024 and has since been declining. This diminishing rate of settlement indicates that the reaction is slowing, rather than expanding. This also implies that CCL's efforts related to liquid and gas removal are effective in mitigating the reaction.

As evidenced by the combined data (See Figure 4), the RA-Data area has always exhibited a faster rate of settlement, which is expected in the portion of Landfill that is experiencing the ETLF event. The surrounding area, the RA-AQMD area, by nature of being in proximity to the RA-Data area, also experienced increased settlement prior to September 2024.

However, as noted by the data, the rate of change of settlement in the RA-AQMD area has always been substantially slower than that in the RA-Data



**Figure 3**



**Figure 4**

## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

area, demonstrating the difference between the true area of CCL being impacted by the reaction and the areas adjacent thereto.

Settlement in the areas adjacent to the RA-Data area is likely caused by the effect of the reaction where the waste mass in proximity to it is influenced by the collapse of the subsurface reaction area and shown here as the zone of greatest settlement. Adjacent settlement is also attributed to the lateral transfer of LFG, heat, and liberated leachate that radiates outward from the RA-Data (See Figure 5).

In summary, while settlement is evident outside the RA-Data boundary, it has been observed at the same rate as within the RA-Data area. More importantly, the rate of settlement across the northwest portion of the Landfill is slowing – it is decelerating.

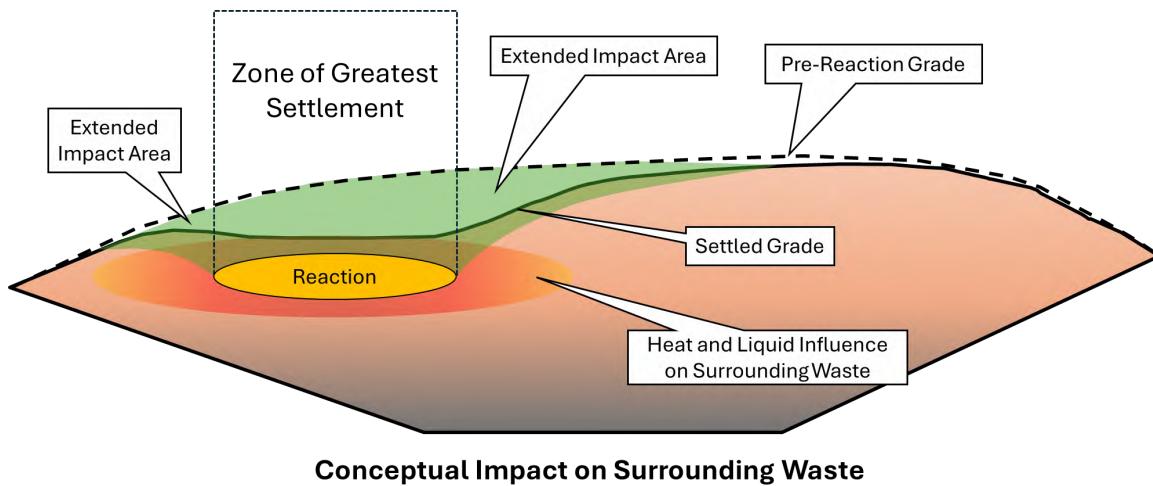


Figure 5

## GOALS

There were two primary goals of this study. The first was to identify areas of accelerated settlement that can be directly attributed to the ETLF event. The second was to quantify the rate of change of settlement to ascertain if the reaction is accelerating or decelerating vertically and/or laterally - and if so in what direction(s).

Most landfills measure settlement in terms of depth settled per time (e.g., 3 feet per year), or as a percentage of depth per time (e.g., 1.5% per year). However, to accurately quantify how the reaction is changing, we evaluated the rate of change in terms of percentage rate of settlement over time. The percentage of settlement is more accurate when evaluating change on a portion of the Landfill that ranges from 0 feet to over 300 feet in depth. Further, evaluating percentage settlement in terms of "rate of change" allowed us to identify settlement trends over time, even when the multiple topographic maps covered varying time intervals.

It should be noted that settlement alone does not necessarily define the RA-Data area. In fact, there are many more criteria that the Reaction Committee continually evaluates in determining RA-Data.

These additional criteria are defined in the Reaction Committee's boundary determination submitted on September 9, 2025. These criteria include, without limitation, wellhead temperatures, down-well leachate liquid temperatures, liquid levels, LFG composition, and LFG surface emission monitoring (SEM) results.

## **METHODOLOGY**

### **Settlement**

Settlement occurs at all landfills to varying degrees and is the result of several interrelated factors, which we examine, in turn, below.

#### *Initial Compaction Density*

Landfills that achieve a high rate of compaction density during initial waste placement will generally see less incremental settlement after placement, though they may achieve a greater ultimate settlement. Operational practices at the CCL historically in-placed waste at a density that exceeded normal industry standard practice. Consequently, by achieving a higher rate of compaction density during initial waste placement, we would expect to see more gradual settlement per year, with an ultimate density above that achieved by the typical landfill.

#### *Waste Type*

Most of the settlement that occurs at landfills results from organic material breaking down through biological decomposition and physical deformation. Thus, it follows that landfills that receive a higher percentage of organic material will settle more and settle faster. However, even inert materials within a landfill will break down physically and as it does, smaller pieces of waste will tend to move downward to fill in the voids that may exist in between coarse, bulky material.

#### *Physical Loading*

The waste mass in every landfill is supported by the physical structure of the waste itself. Even paper and cardboard can provide small, almost microscopic trusses, while larger items like poles and lumber can create a complex system of beams, columns, and trusses that help support the waste mass.

Over time, those supporting structures in the landfill's waste mass are impacted by the loading (weight) of subsequent overlying layers of material (waste and soil). That loading, along with the processes of creep, deformation, and compression, will eventually cause the supporting structure of the waste mass to gradually lose strength and fail, thereby allowing the landfill to settle. Other factors like increasing moisture content and decomposition will exacerbate the loss of physical strength. For example, cellulose fibers that are present in wood, brush, cardboard and other materials will decompose and soften over time.

## Biological Decomposition

All organics within the Landfill are at some state of decomposing. In the process, solid organic material is converted into gas. This process of biological decomposition is normal. However, in the case of the ETLF portion of the Landfill, biological decomposition is quite accelerated, resulting in rapid liberation of LFG, liquid leachate, and associated settlement.

## Chemical Processes

Within all landfills, there are also chemical processes that will weaken the internal supporting structures leading to a loss of support and eventual settlement. Ferrous metal will rust (i.e., oxidize) over time and whatever support was initially provided by those items will be lost.

The amount of settlement, and time period over which it occurs is generally predictable at most landfills, but not at landfills that are experiencing ETLF conditions.

Also, the ultimate settlement at any landfill, including CCL, and the time required to settle is very dependent on the overall depth of waste. The greater the overall depth of waste, the greater the loading on lower layers, and thus the greater the degree of settlement. This can be exacerbated during ETLF conditions due to the higher temperatures and the increased liberation of liquid leachate.

Consequently, even though waste may have been placed at a constant density during the operational phases of the Landfill, the lower portions of the waste column will become denser as additional layers (i.e., loading) are placed. This is shown conceptually in Figure 6 where we can see the first layer (at time 0) is placed at a certain density, and it consumes a specific depth of landfill airspace. However, as subsequent layers are stacked on top, and even though each new layer is placed at the same density and consumes a similar depth of airspace, the underlying layers become progressively more compressed (e.g., denser). Consequently, the lower layers, which have the greatest loading, receive the greatest loading and therefore achieve the highest density.

Settlement is typically quantified by either overall settlement depth measured in an elevation change or as a percentage of settlement. The percentage of settlement is calculated by dividing the measured depth of settlement by the depth of the underlying waste prior to settlement occurring. Both can be presented for a specific interval of time such as annually, or the total



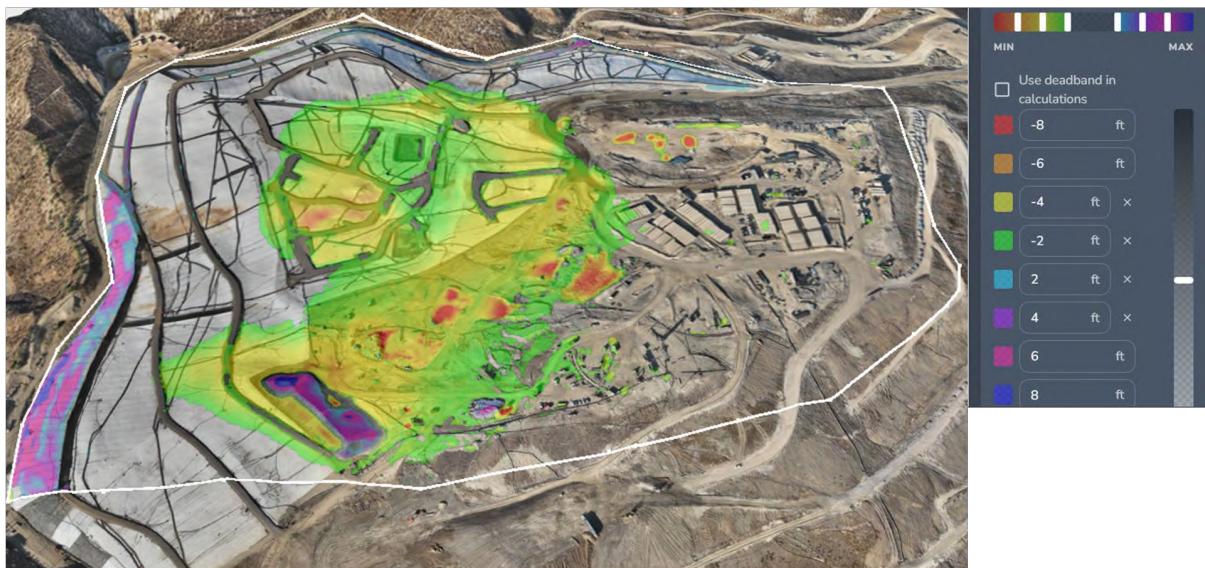
timeframe of the site such as lifetime ultimate settlement.

## *Surface Settlement Analysis: May 18, 2023, through May 21, 2025*

Both methods require a before and after topographic map of the Landfill.

CCL continues to create and submit a monthly isopach map to several regulatory agencies which show an isopach image of settlement across a specific portion of the Landfill. Those isopach maps use various colors to illustrate the degree of settlement in specific areas. This is measured in feet and provides a visual representation of where and how much the surface topography has settled as is shown in Figure 7.

### Chiquita Canyon Landfill - Isopach



January 3, 2025 Survey Image. October 2, 2024 vs January 3, 2025

Figure 7

### **Baseline Settlement**

Every landfill settles over time, but as previously noted, the rate of settlement varies from one landfill to another. To identify and quantify surface settlement caused directly and/or indirectly by the ETLF reaction, we had to establish a baseline settlement rate that applied specifically to CCL and which was outside the RA-Data.

## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

It is important to note that unlike overall settlement measured in elevation change, the rate of change is influenced by the depth of waste in relation to a period of time. Because it is measured by the elevation change divided by the depth of waste prior to settlement occurring, the rate of change in shallow waste can be more than in deeper waste as Figure 8 shows. This is evident in the isopach maps in later sections of this report.

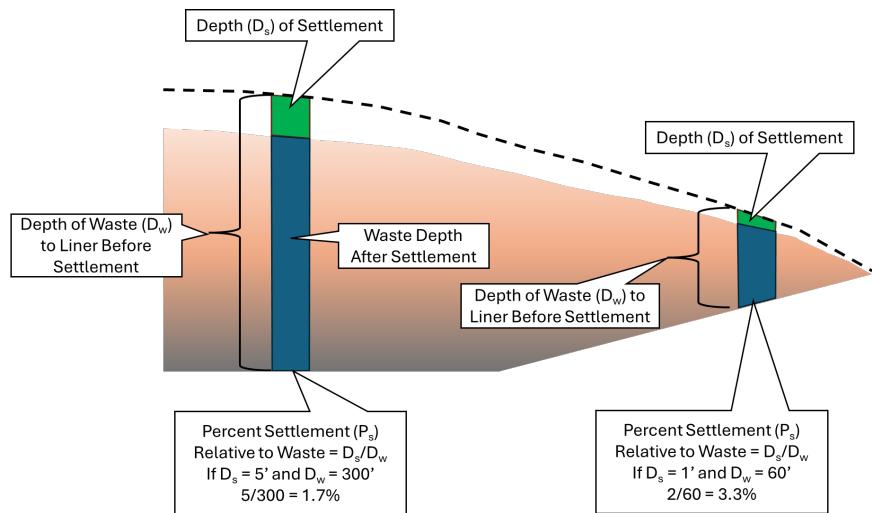


Figure 8

The portion of CCL we selected for our settlement baseline was in the southeast portion of the Landfill (See Figure 9). This area was chosen because it was furthest from the RA-Data and had not recently received any new waste (from 2021-2025).

The initial baseline analysis area (the blue boundary) had a grid of sample points every 50 feet, providing 850 points on a 50-foot grid pattern. From this area we extracted annual elevation points over a 4-year period.

However, under closer inspection and after pulling those points into CAD and Excel, we discovered that there were areas where some localized activity occurred within the four-year period. Consequently, we reduced the area from 850 points to 324 points where there was less significant change to the topography year-to-year. This area, with its 324 points (within the green boundary) was used as our non-reaction baseline for defining typical settlement.

Surface elevations for each of those 4 years were recorded for each of those 324 points resulting in a total of 1,296 elevation data points.

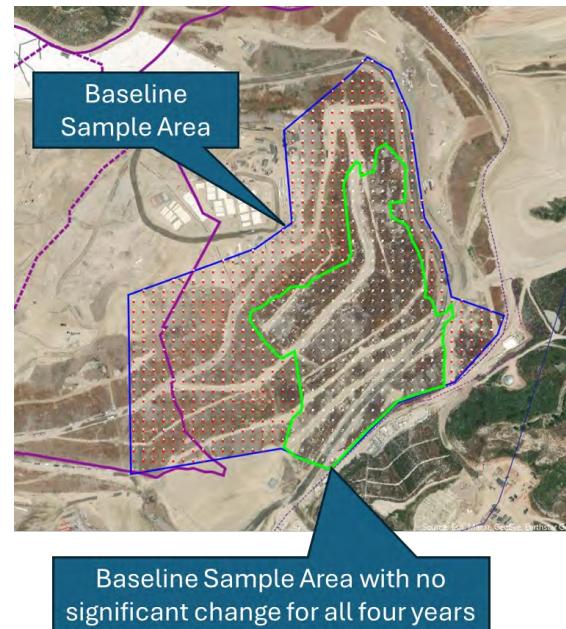


Figure 9

Using the elevation data points, we measured the elevation change between each year's topographic mapping. Because some minor grading (i.e., cutting and filling) activities did occur within the final dataset, there were some outliers in terms of year-to-year settlement. To address those elevation anomalies, we eliminated the upper and lower 2% of the points. A total of 50 points were eliminated, leaving a remainder of 1,246 points for our baseline settlement calculation.

## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

All elevations were then evaluated in a scatter plot showing the annual change in elevation relative to the depth of waste at the start of the year (See Figure 10). This data showed a clear pattern of settlement that was in line with industry standards. Please note that in our calculations, we began by calculating daily percentage settlement to account for topographic maps that ranged from weekly to monthly. Then, we standardized all settlement results by converting them to an annualized percentage settlement based on total waste depth.

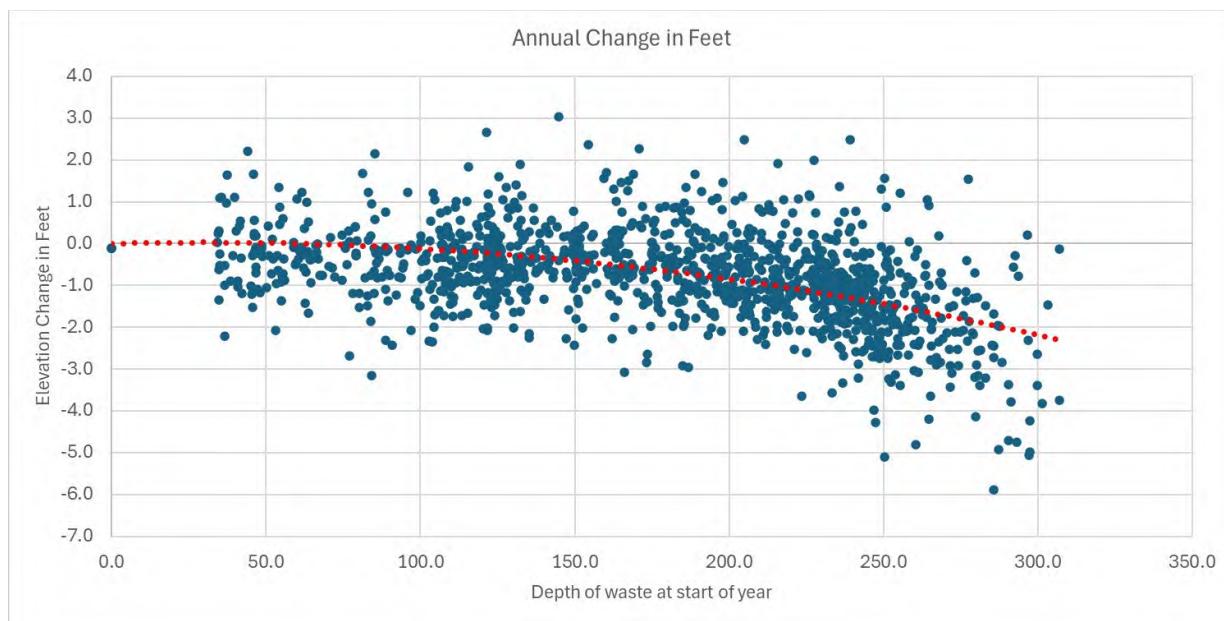


Figure 10

Please note that along with the settlement data which is shown as a negative value (in feet), there are certain areas that show positive values, which indicate localized fill activity or potentially some error in topographical mapping. During our review of the topographic maps over that four-year period, we determined that many of those areas that showed up as fill were in fact related to road maintenance, slope repair, and placement and removal of stockpiled material.

## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

Finally, to help quantify the time component regarding settlement, we showed the average annual settlement percentage for the entire baseline area. The annualized rate of change (i.e., percentage settlement) appeared to be in line with industry standards at 0%-2.1% per year, as shown in Figure 11.

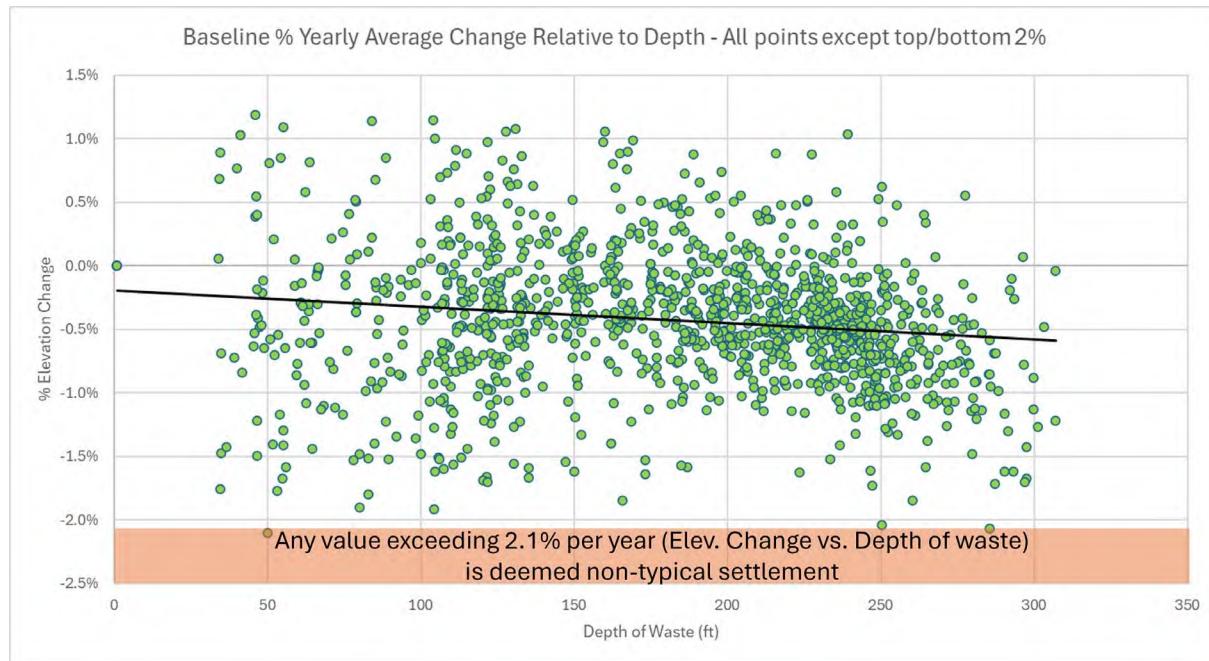


Figure 11

These baseline rates of change, which we deemed to be typical of CCL allowed us to conversely determine settlement rates that were outside the norm for CCL. We then used this data to identify annualized elevation changes in and around the RA-Data. In that regard, we determined that CCL's typical annualized settlement change was 2.1% of the waste depth, and that any settlement greater than 2.1% could be attributed directly or indirectly to the reaction. Again, please note that by convention, the landfill industry measures settlement on an annual basis. So, even though we had before and after topographic maps from intervals as frequent as weekly; by converting all data to an annualized settlement rate, we maintained the industry's standard units of measurement.

## **Detailed Site Settlement Analysis**

With CCL's baseline settlement rate established, BRS generated new data sample points across the entire site. We selected data points based on the existing inspection grid, dividing each into quadrants, placing sample points at the center of each of those quadrants as is shown in Figure 12 with green background.

In this manner, a total of 718 points were generated across the entire Landfill footprint as shown here in Figure 13.

For the 2-year evaluation period, there were 82 individual topographic maps generated through Propeller. This equates to 81 *before and after* sample periods where elevation change occurred and 81 periods were evaluated. By taking an elevation for each of the 718 sample points from each of the surfaces, a total of 58,138 elevation change data points were obtained.

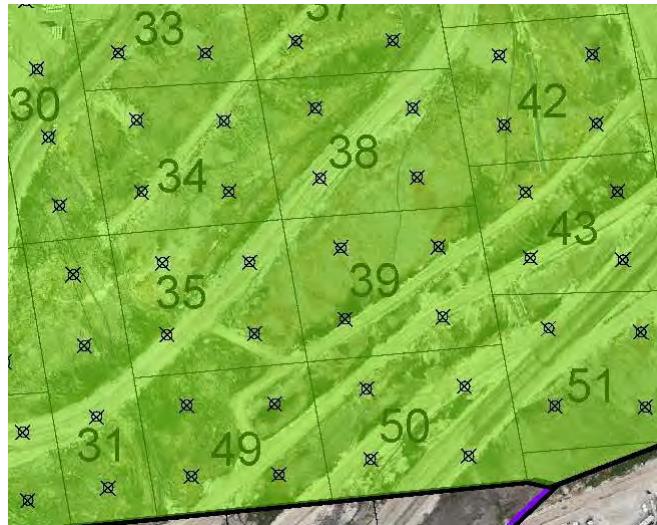


Figure 12



Figure 13

## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

The isopach shown here (See Figure 14) shows the positive and negative (fill or cut) elevation changes for all 58,138 data points for the two-year analysis period. Based on this before and after comparison, the RA-Data and its influence (e.g., depth of settlement) on adjacent areas can be clearly seen.

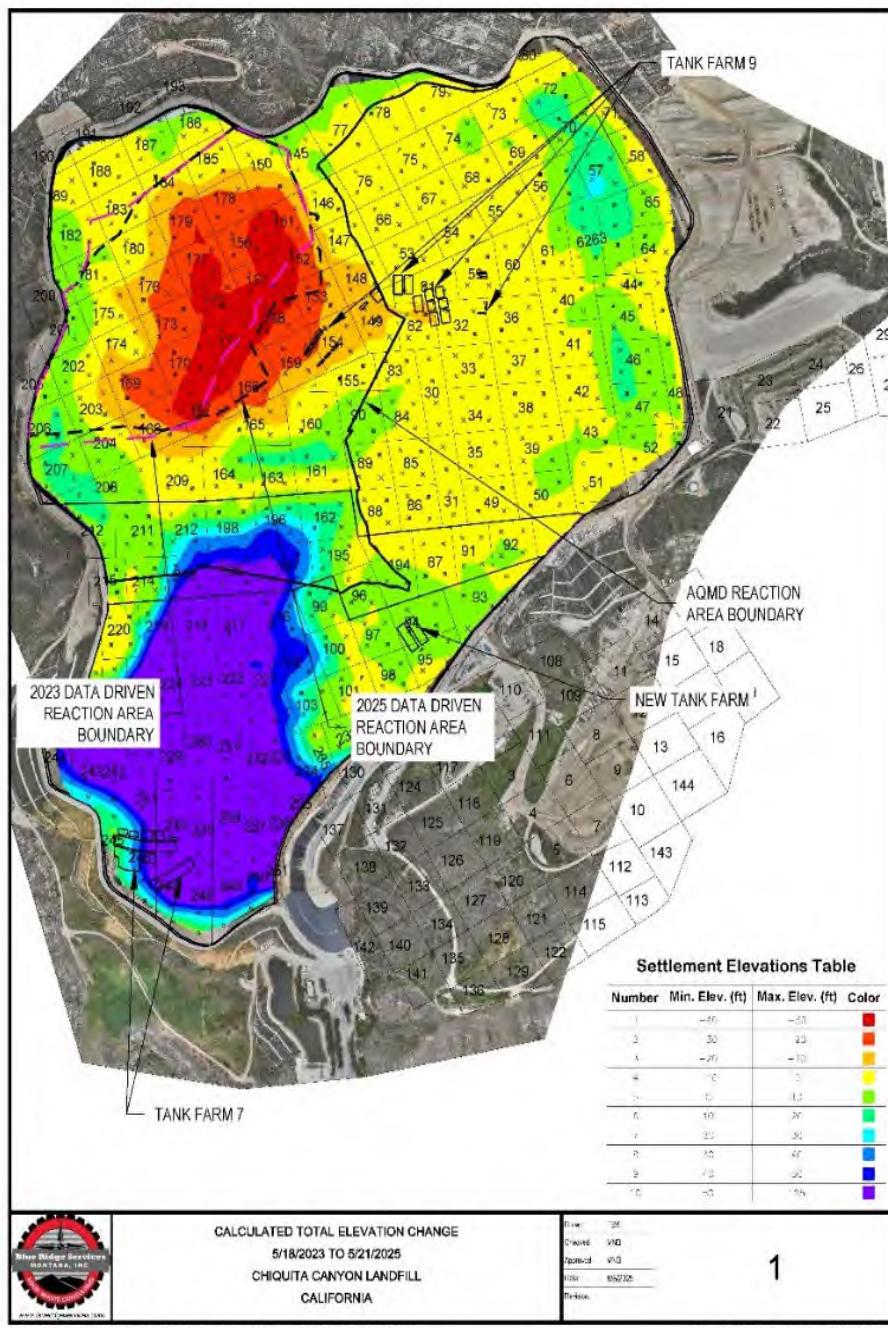


Figure 14

## **Total Settlement: North Half**

However, because waste filling was still occurring in the southern portion of the Landfill during the analysis period (May 18, 2023, through May 21, 2025) we reduced our data set from 718 points, down to only 453 points in the north half of the Landfill. These were used with the sample area shown in Figure 15 as the green area. This resulted in a total of 37,146 points remaining for analysis.

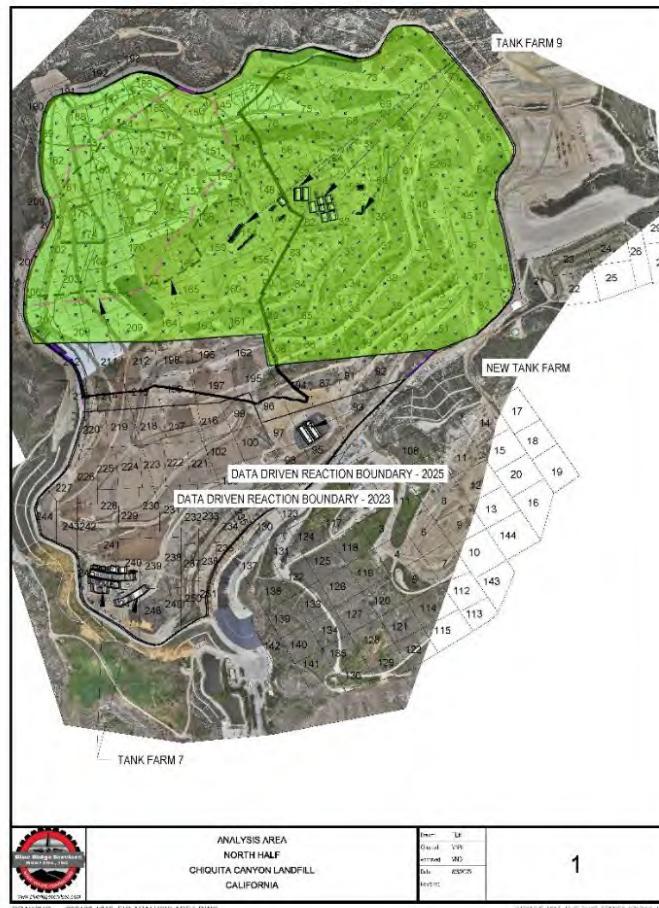
Using data points from the north half, the first analysis was for total settlement between the start and end of the evaluation period, that being May 18, 2023, through May 21, 2025. This was done with more detailed gradation in the settlement depth color bands to identify the area of the reaction that showed the most subsidence. The purpose was to identify the potential horizontal limit of the reaction itself. Additionally, it shows the adjacent areas that were directly or indirectly impacted by the excessive settlement in the area experiencing the ETLF event.

## **Rate of Change**

The rate of change is simply taking the percentage of elevation change relative to depth in relation to a time interval. Typically, settlement evaluations of a site are done on a yearly basis with CCL submitting monthly submissions showing the settlement for the month, expressed in feet.

In the analysis for this report, it was necessary to convert the data into a change in elevation per day because the Propeller drone mapping flights varied in frequency. Initially the mapping flights were performed monthly and then increased to twice a month. Now, these mapping flights occur weekly.

To adjust for this inconsistency in between mapping periods, we calculated the number of days in that period and then divided by the total elevation change for each point. At each point with the known elevation change per day for that period, it was then divided by the depth of waste at [Figure 15](#) the start of the period in question. This elevation resulted in a percentage change in elevation per day relative to the depth of waste.



## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

As previously noted, we converted the rate of change from daily to an annualized percent rate of change to comply with the industry's standard practice of expressing landfill settlement per year. Figure 16 shows the average annual percentage settlement per year over the two-year period of the evaluation. The two-year total average clearly shows the limits of the reaction with the yearly average providing more detail on the impact of the reaction to the east. Most of the area outside of the RA-Data is experiencing a rate of change of less than 2% per year (purple and dark blue zones), which is within the baseline.

Any additional increase is likely the indirect result of the reaction through horizontal migration of heat and liquids as well as liquid removal as part of the mitigation efforts.

To help visualize any potential that the reaction was spreading, we also evaluated the rates of change on a reduced frequency.

By evaluating the percentage settlement monthly, the dynamic nature of CCL became more evident. This is particularly evident along the northeastern and eastern perimeter of the landfill (See Figure 16).

Based on review of aerial photo imagery at the time topography was generated and on review of the surfaces of selected topography the variations in the percentage settlements were due to localized grading, the adding and removing of stockpiles, placing or removing tanks, repairing settled areas, and other activities.

The effect of minor modifications to the surface elevation are much more evident along the perimeter where waste is shallow. Remember that the percentage change in settlement is based on the elevation change divided by the underlying depth of waste. Where the waste depth is shallow, the denominator becomes very small, so even minor changes in the numerator result in exaggerated percentage settlement.

Another likely contributor to these fluctuations is the massive quantities of liquids that have been, and continue to be, removed from the site through wells and the LCS. This loss of volume is likely causing

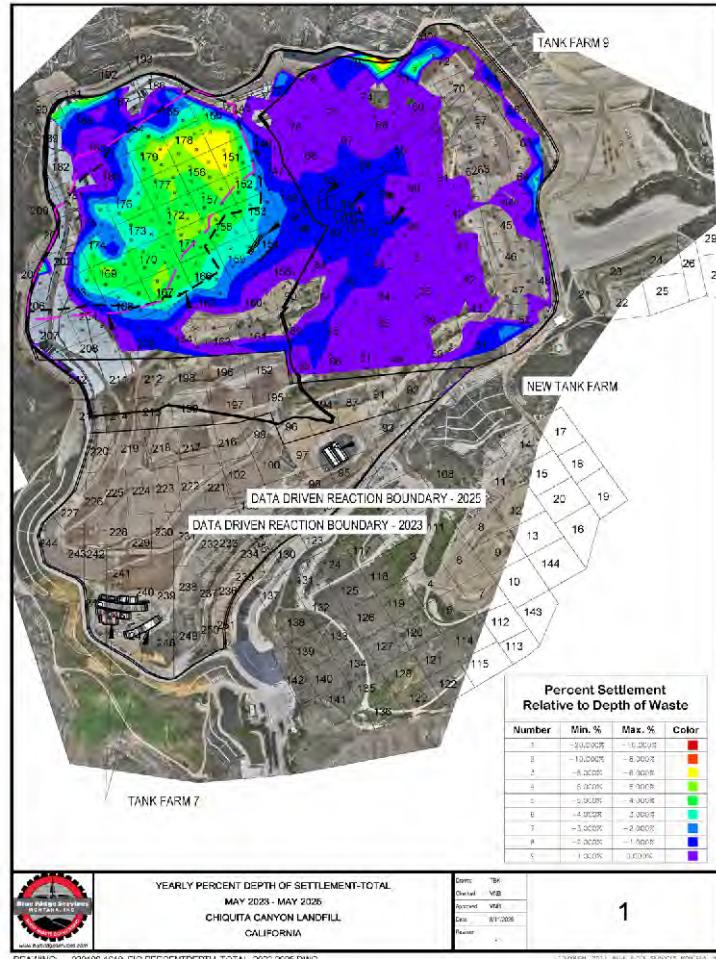


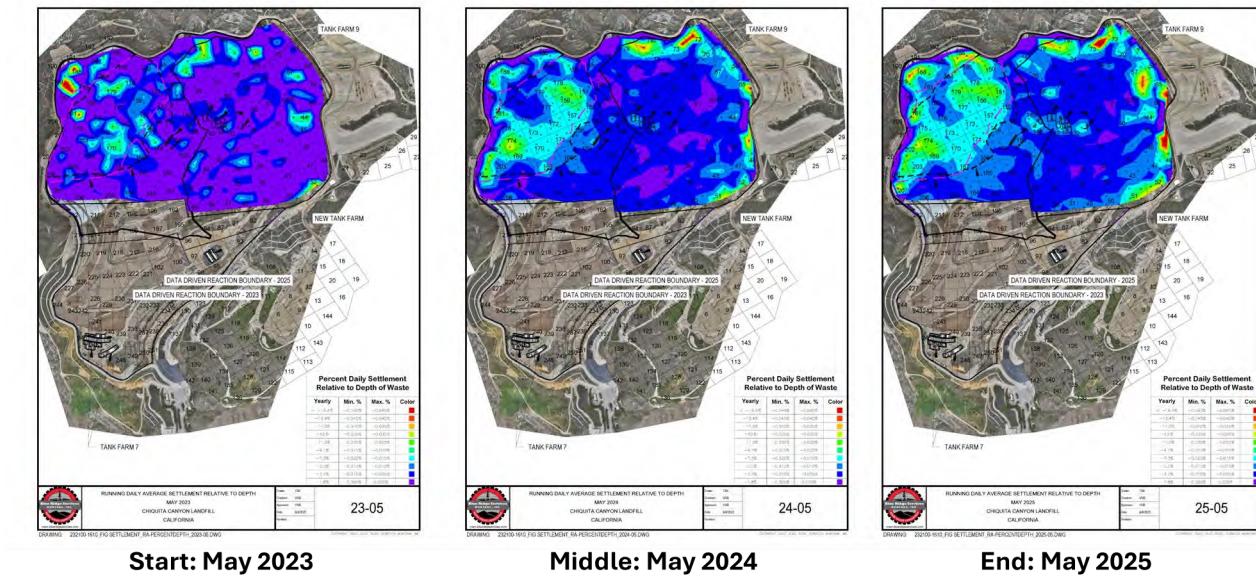
Figure 16

## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

some subsurface consolidation. To address these fluctuations, a Cumulative Average and a 3-Month Rolling Average were used to buffer out the extremes in the data.

### Cumulative Average

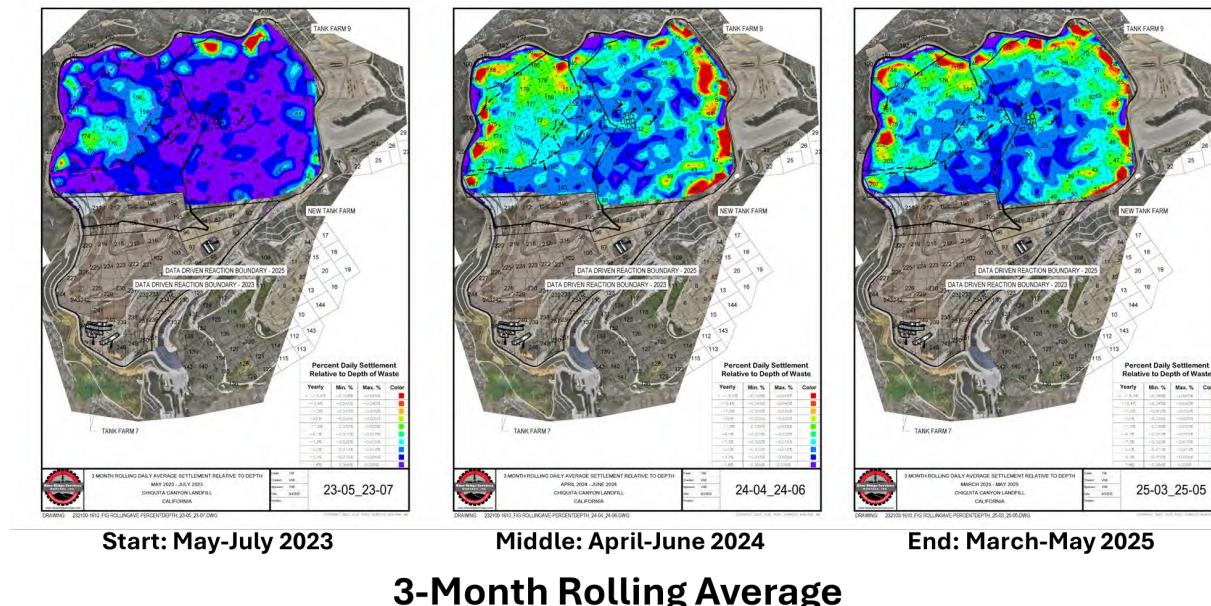
The Cumulative Average is the running average of all data sets measured from the starting date to each monthly increment. As an example, the following Figure 17 shows the cumulative daily average, averaged from the start of the two-year period, for May 2023, May 2024, and May 2025. The full set of monthly comparisons can be found in Appendix A.



## Surface Settlement Analysis: May 18, 2023, through May 21, 2025

### 3-Month Rolling Average

Our last analysis was to create a 3-month rolling average of the daily percent change in elevation relative to the depth of waste. However, rather than average the rate of change from the earliest topographic map, in this analysis we simply averaged the settlement that was happening over a 3-month period, with those 3 months rolling every month. As an example, the following Figure 18 shows the rolling average for the periods of May through July 2023, April through June 2024, and March through May 2025. The full series can be found in Appendix B.



**Figure 18**

Based on the cumulative and 3-month rolling averages, though there are areas of increased settlement outside of the RA-Data boundary, the majority are below the rates seen within the RA-Data. When high rates of settlement are observed, they are not consistent enough to indicate that the reaction has spread to the east – or beyond the current RA-Data boundary.

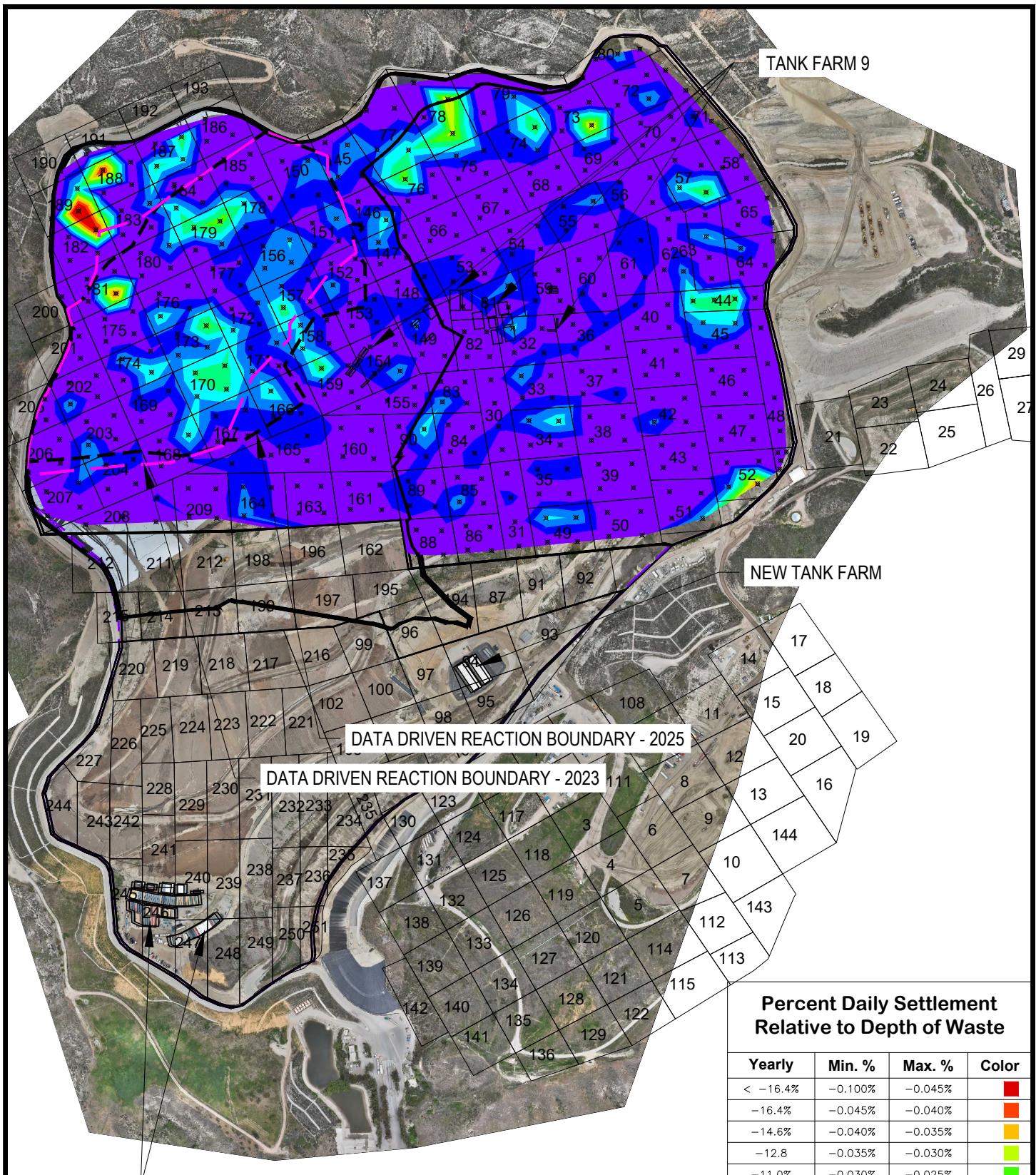
## CONCLUSION

Our analysis shows that the rate of change of settlement within the RA-Data is slowing. Similarly, the rate of change of settlement in areas outside – but adjacent to – the RA-Data is also slowing.

We believe those changes inside and outside the RA-Data are interrelated and are more likely the result of the indirect effects of the main subsurface reaction inside the RA-Data. The variability in rate of change of settlement in areas outside the RA-Data are the result of horizontal migration of liquids and heat causing the normal decomposition rate to increase, but not at a rate that could be associated with an ETLF event.

# Appendices A

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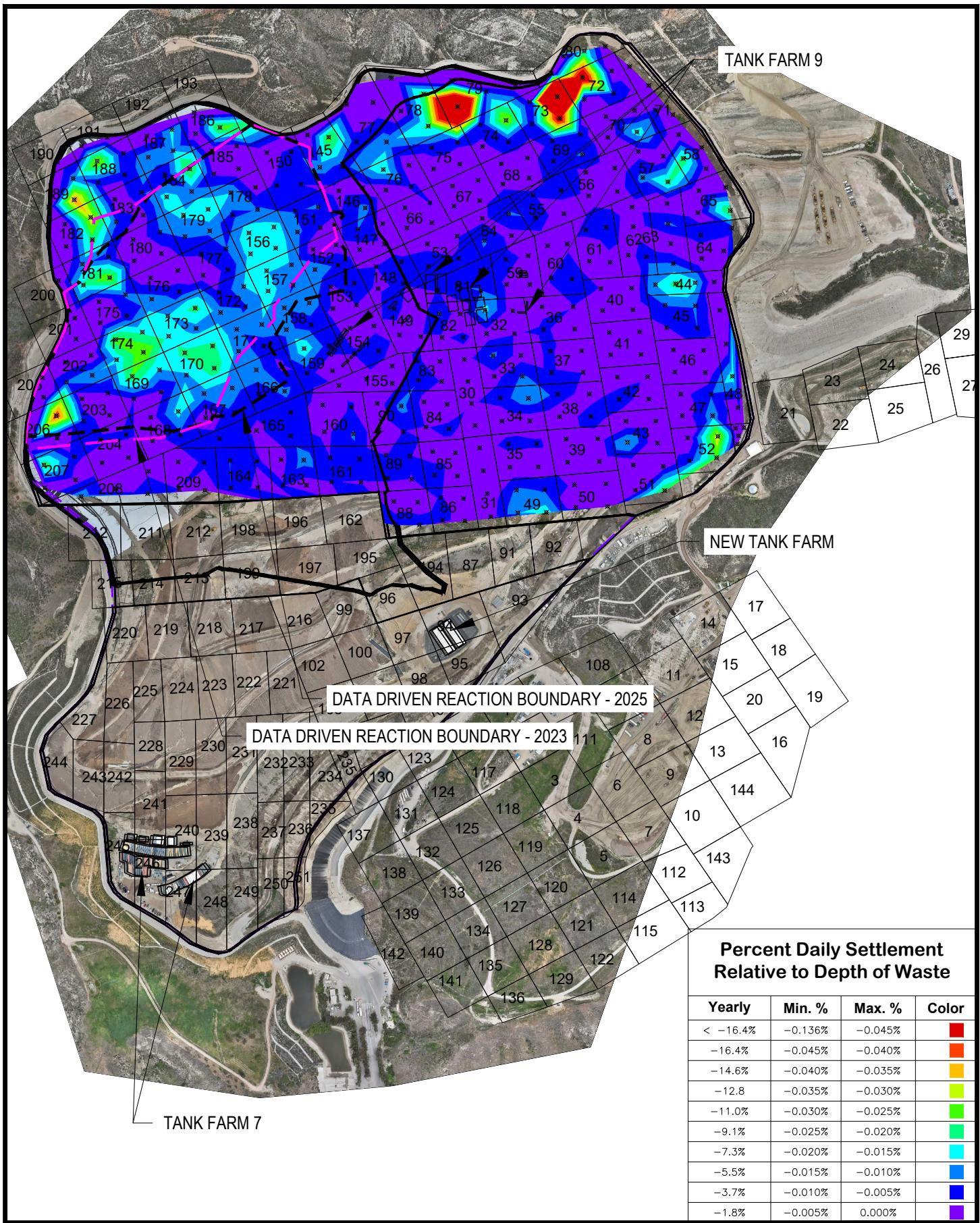
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-16.4%	-0.045%	-0.040%	Orange
-14.6%	-0.040%	-0.035%	Yellow
-12.8	-0.035%	-0.030%	Light Green
-11.0%	-0.030%	-0.025%	Green
-9.1%	-0.025%	-0.020%	Light Blue
-7.3%	-0.020%	-0.015%	Blue
-5.5%	-0.015%	-0.010%	Dark Blue
-3.7%	-0.010%	-0.005%	Black
-1.8%	-0.005%	0.000%	Purple



RUNNING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
MAY 2023  
CHIQUITA CANYON LANDFILL  
CALIFORNIA

Drawn:	TBK
Checked:	VNB
Approved:	VNB
Date:	8/3/2025
Revision:	-

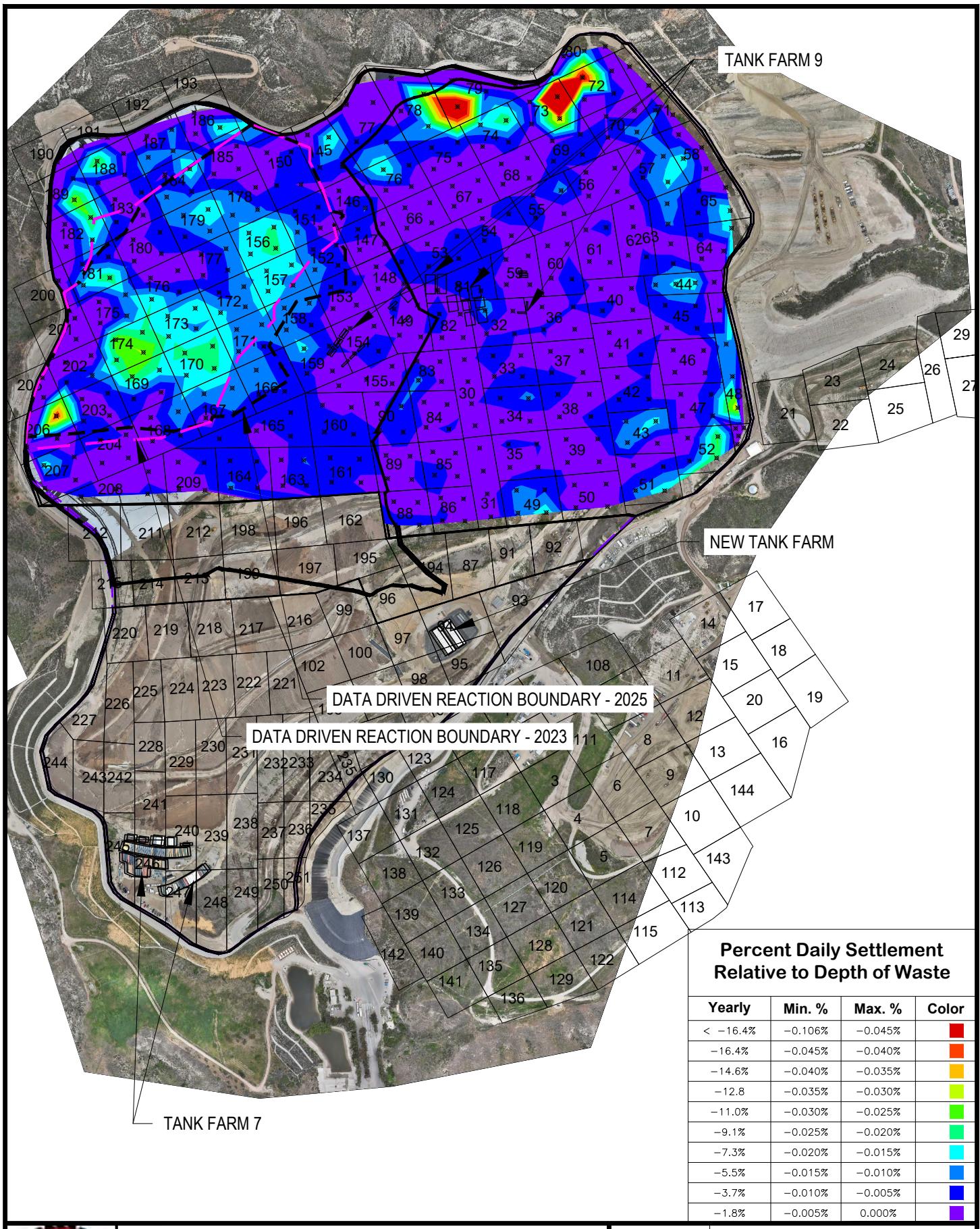
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Date: 8/3/2025  
Revision: -

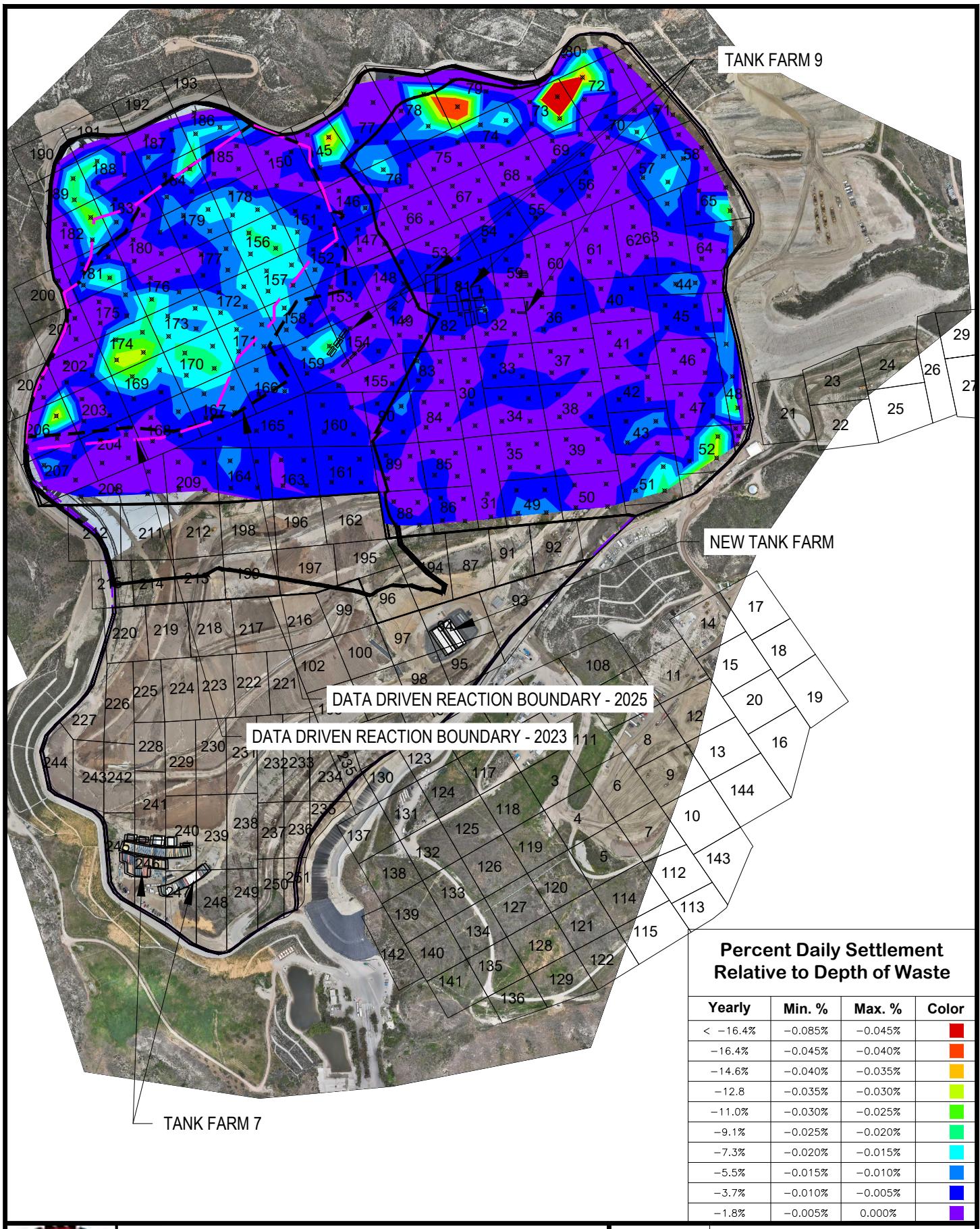
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CHIQUITA CANYON LANDFILL  
CALIFORNIA

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Date: 8/3/2025  
Revision: -

23-07



### Percent Daily Settlement Relative to Depth of Waste

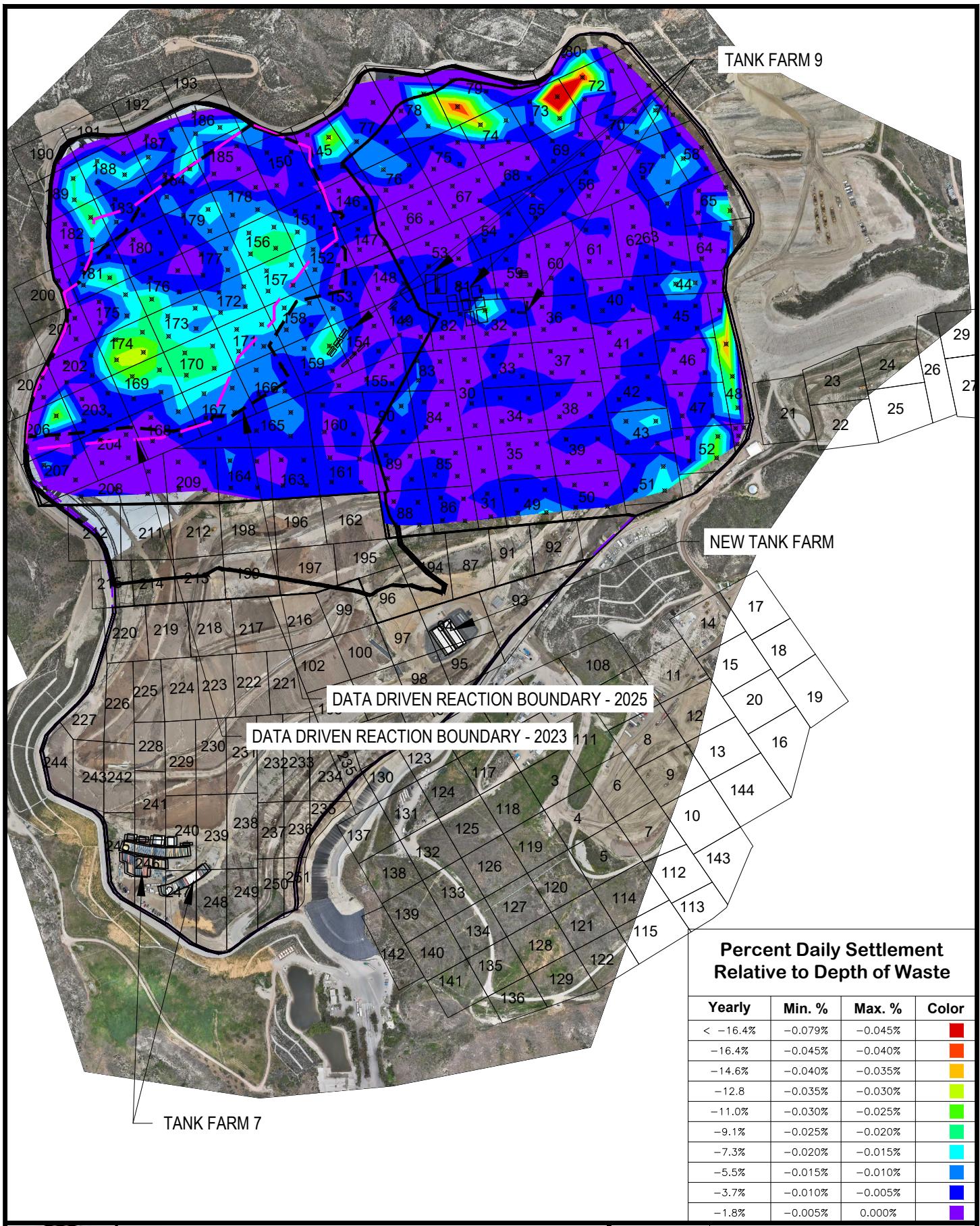
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-14.6%	-0.040%	-0.035%	Yellow
-12.8	-0.035%	-0.030%	Light Green
-11.0	-0.030%	-0.025%	Green
-9.1	-0.025%	-0.020%	Light Blue
-7.3	-0.020%	-0.015%	Cyan
-5.5	-0.015%	-0.010%	Dark Blue
-3.7	-0.010%	-0.005%	Dark Blue
-1.8	-0.005%	0.000%	Dark Purple



RUNNING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
AUGUST 2023  
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CALIFORNIA

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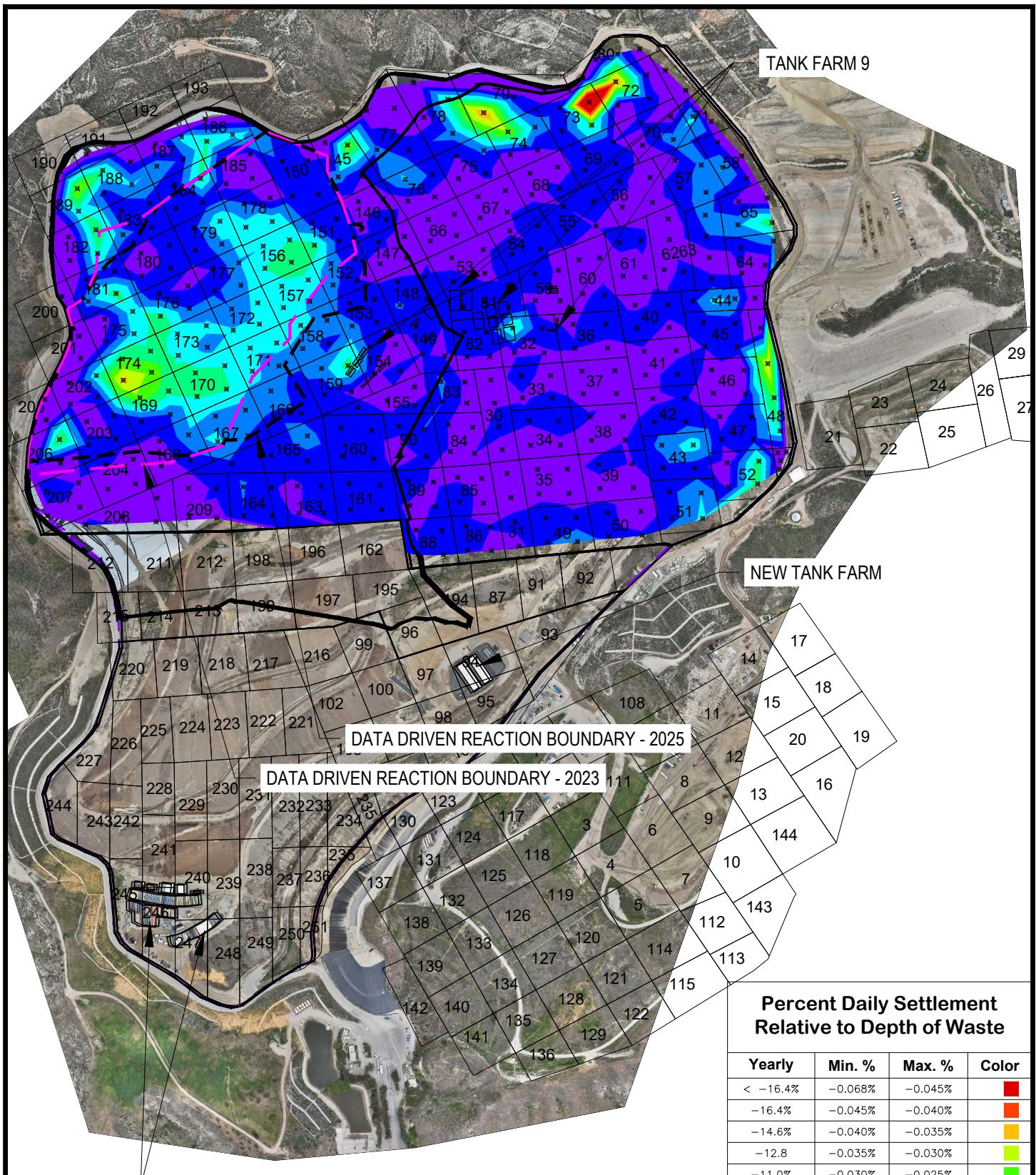
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Revision: -

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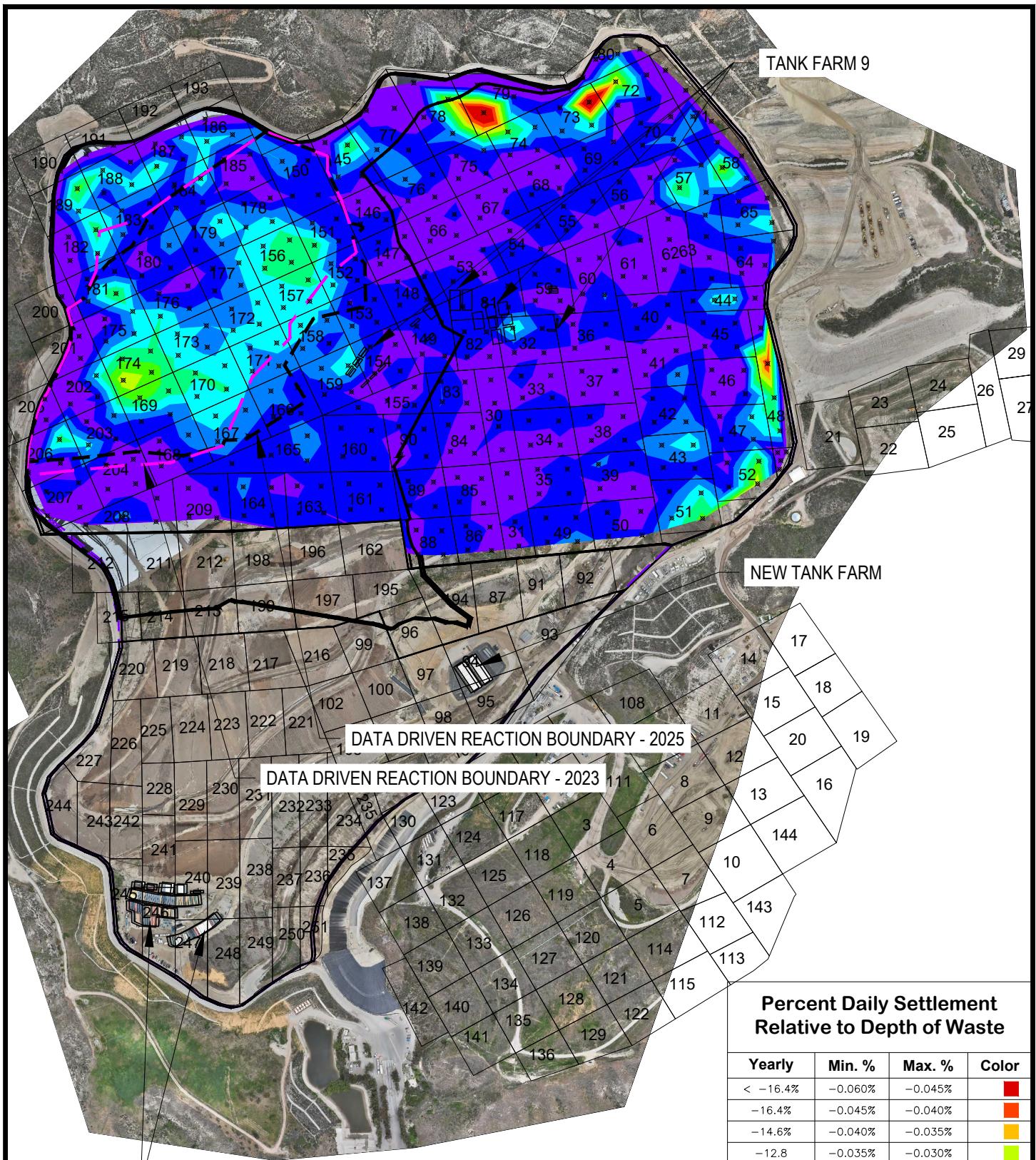
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-5.5%	-0.015%	-0.010%	<span style="background-color: blue;">█</span>
-3.7%	-0.010%	-0.005%	<span style="background-color: darkblue;">█</span>
-1.8%	-0.005%	0.000%	<span style="background-color: purple;">█</span>



RUNNING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
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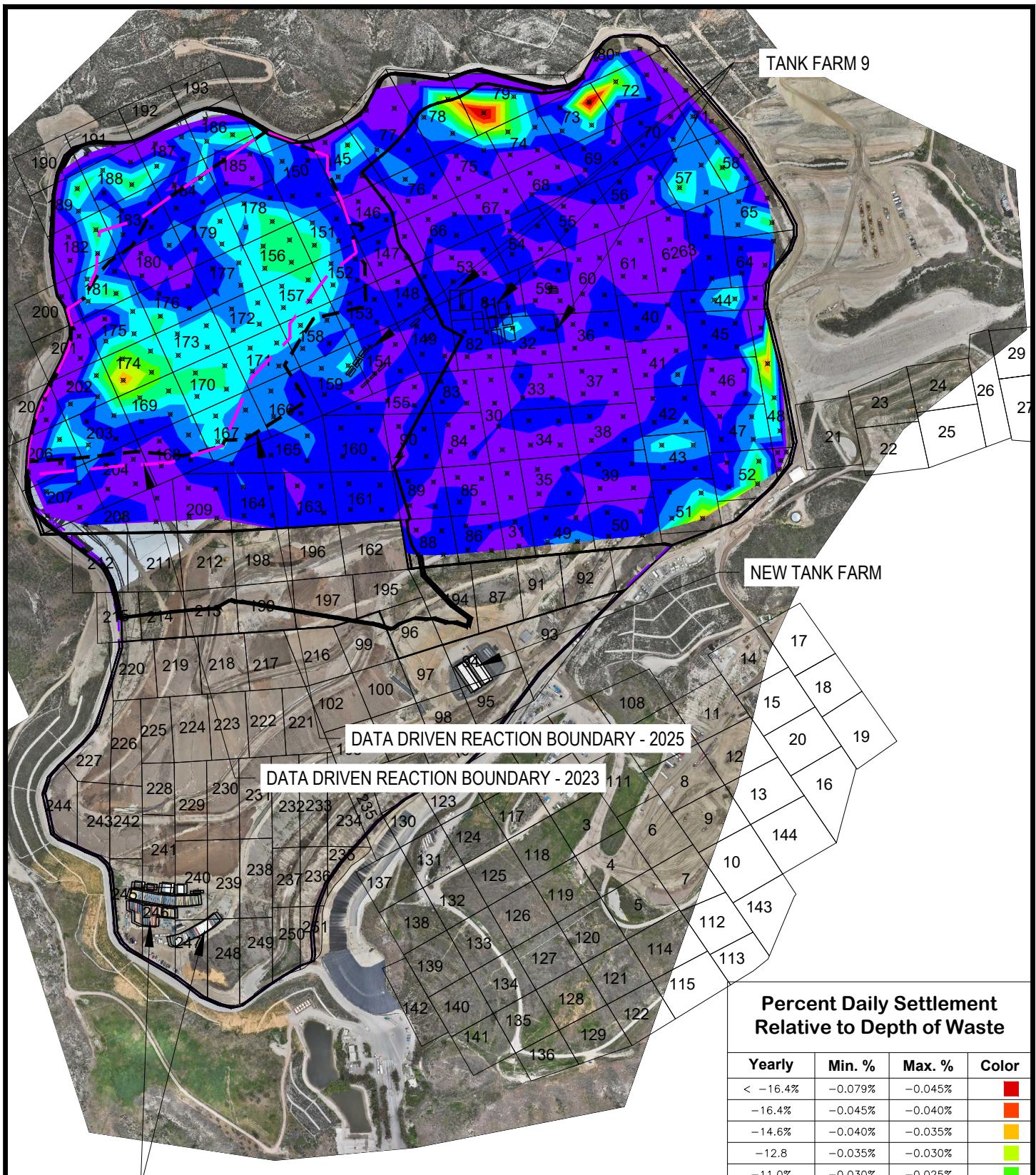
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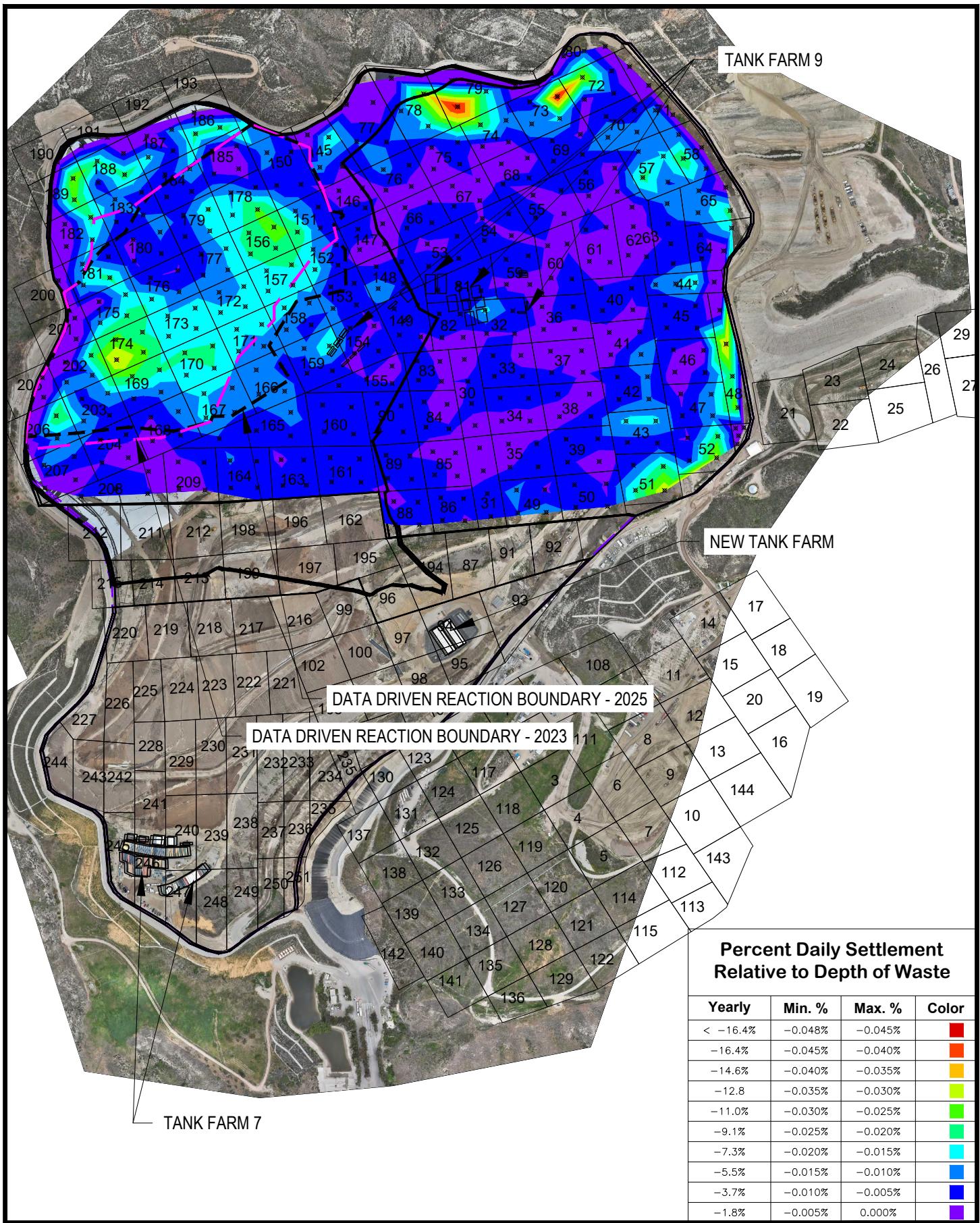
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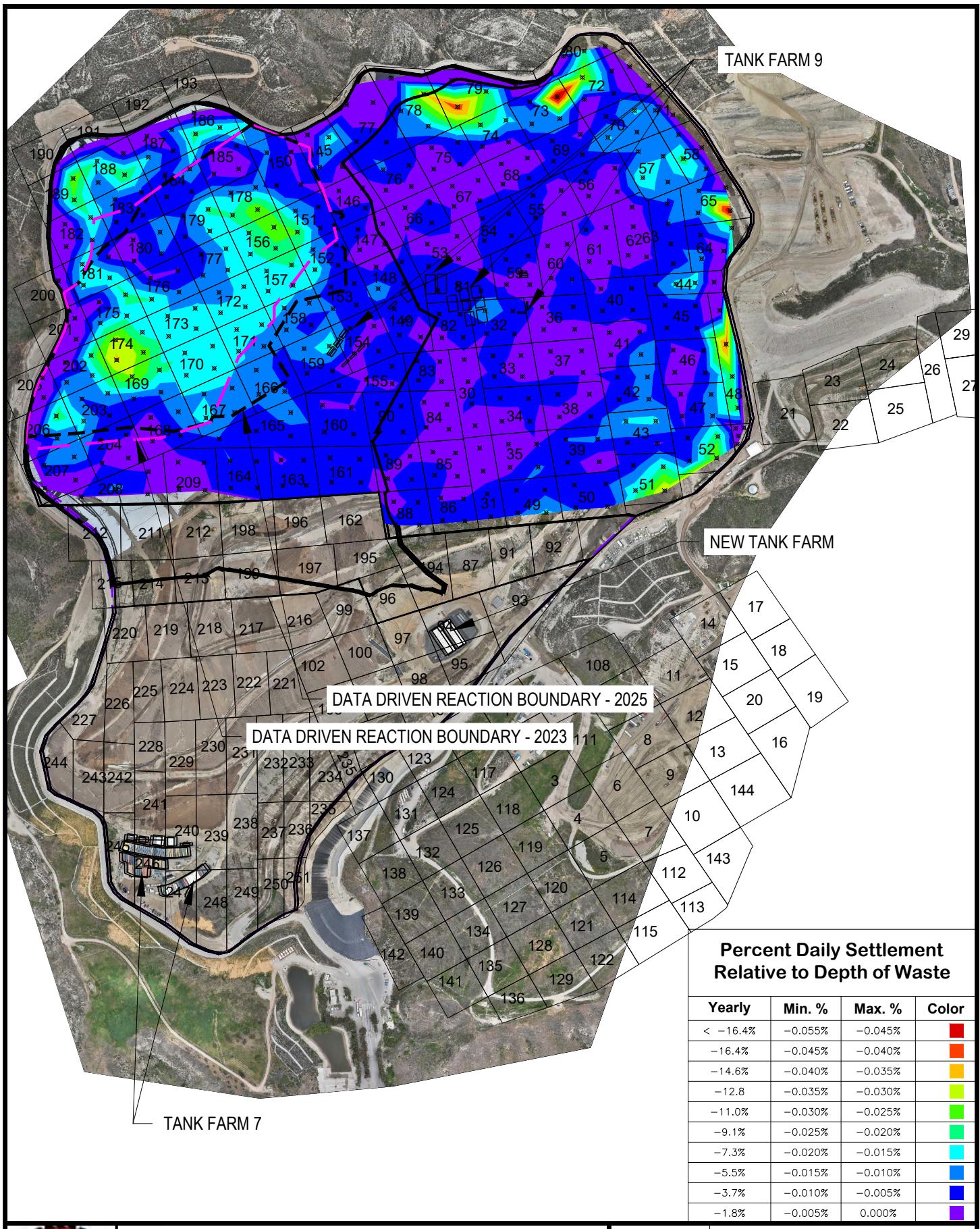
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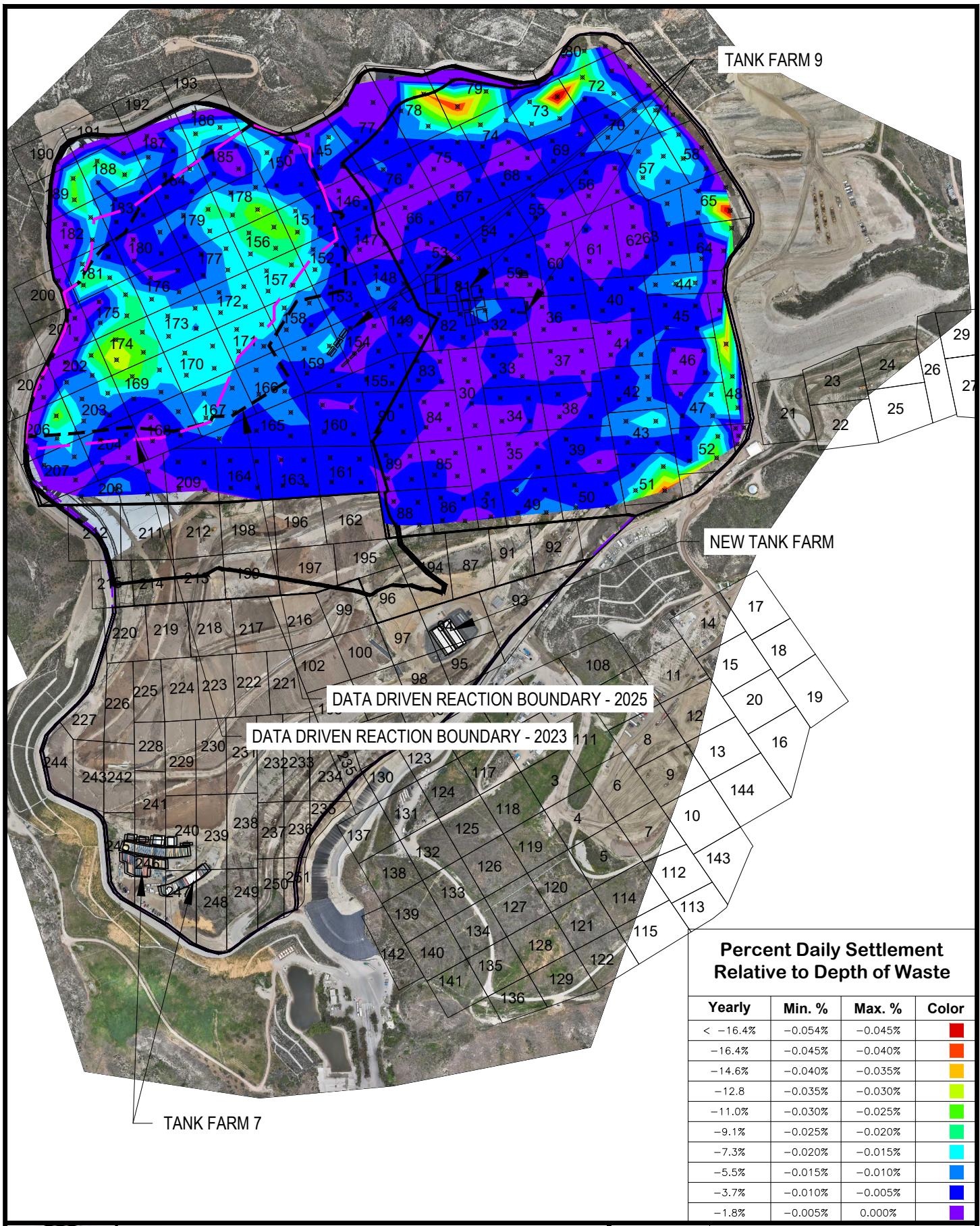
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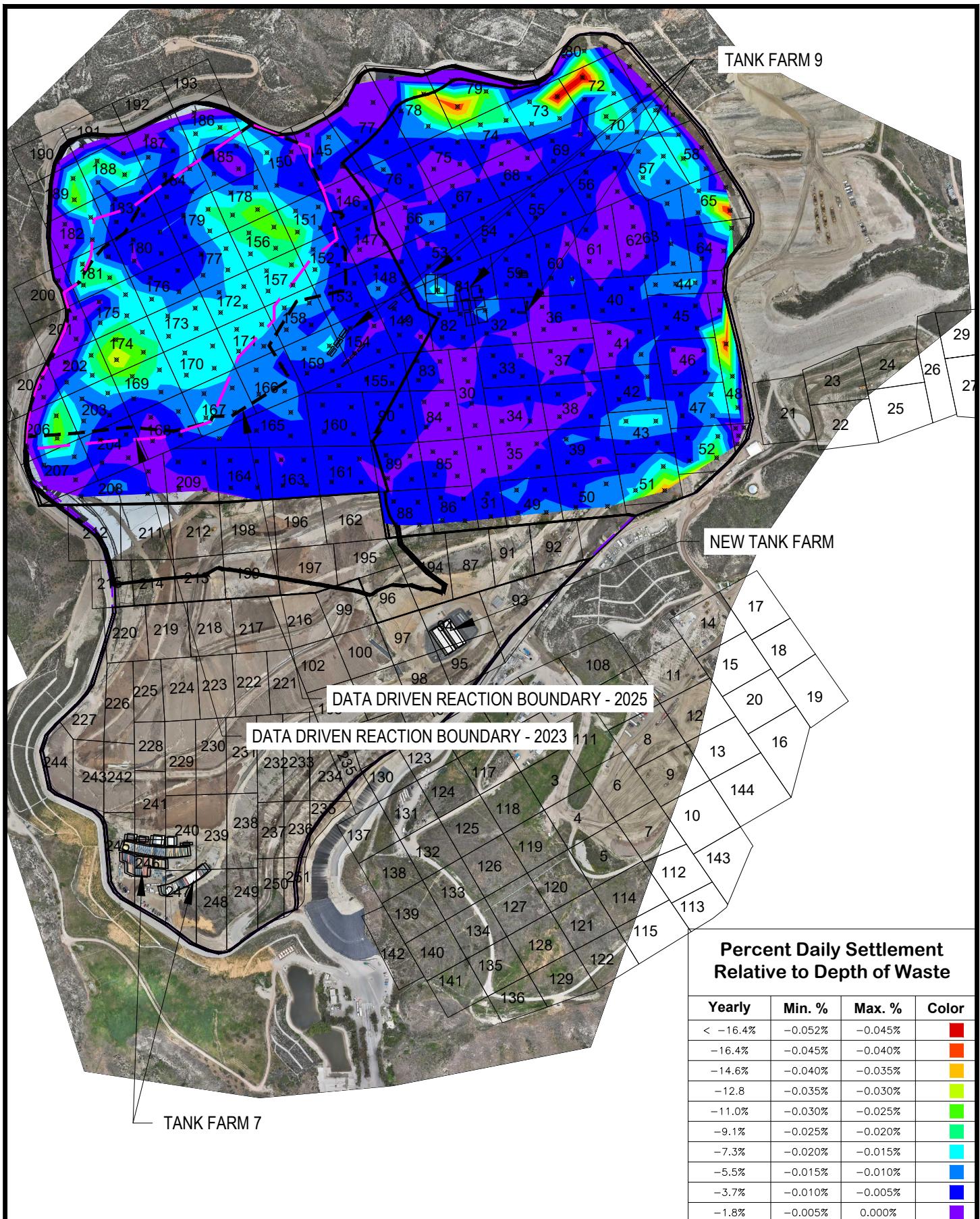
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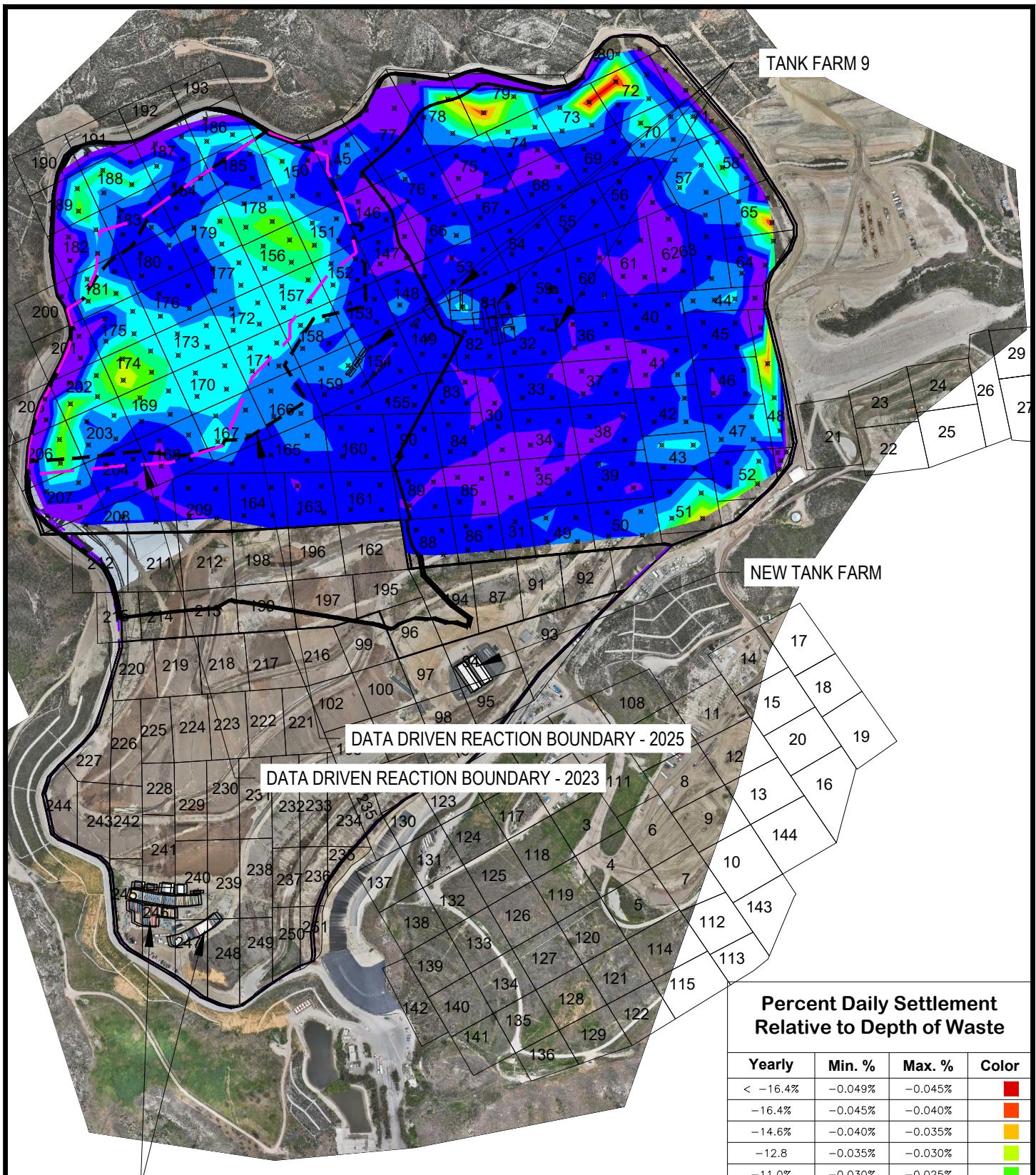
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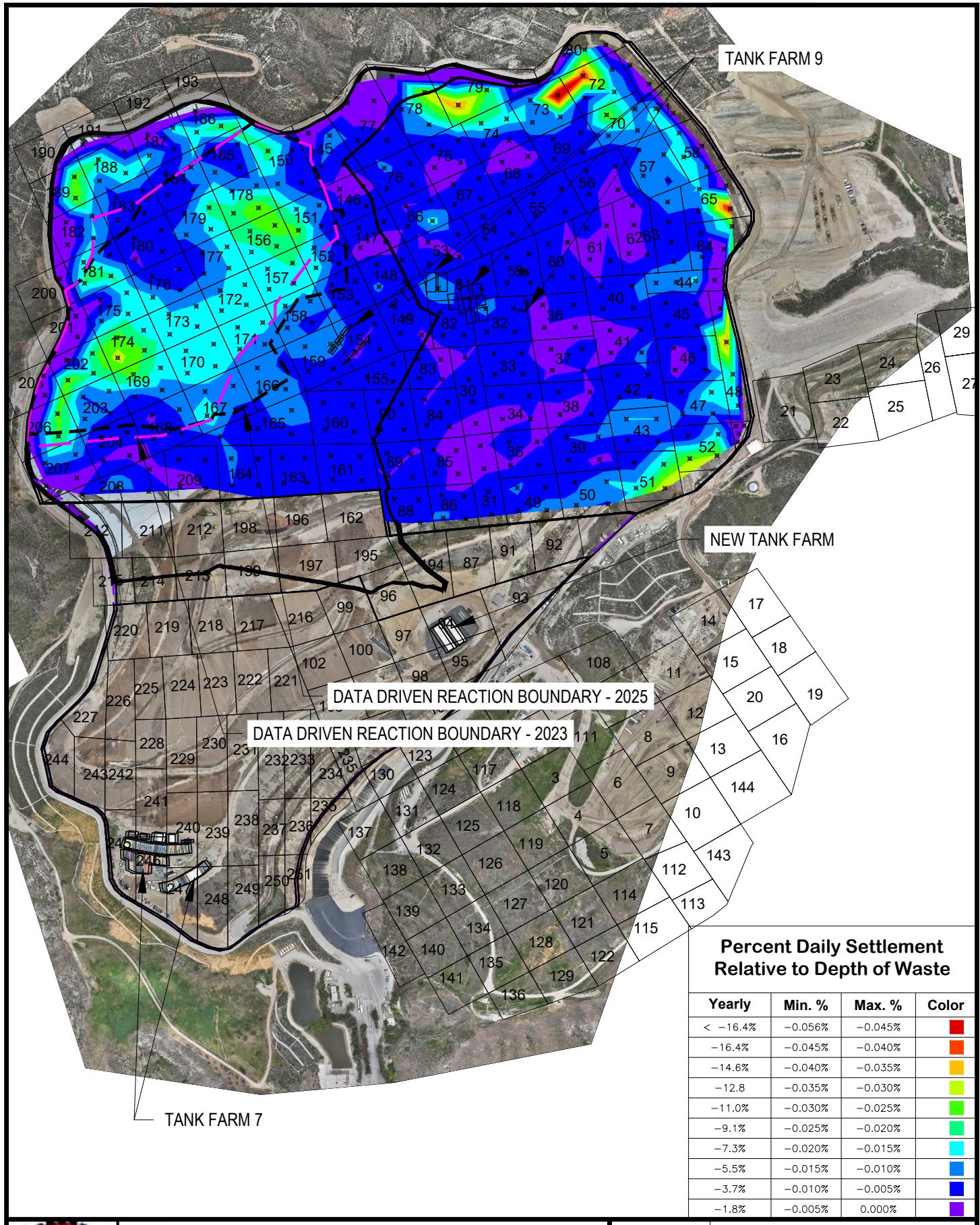
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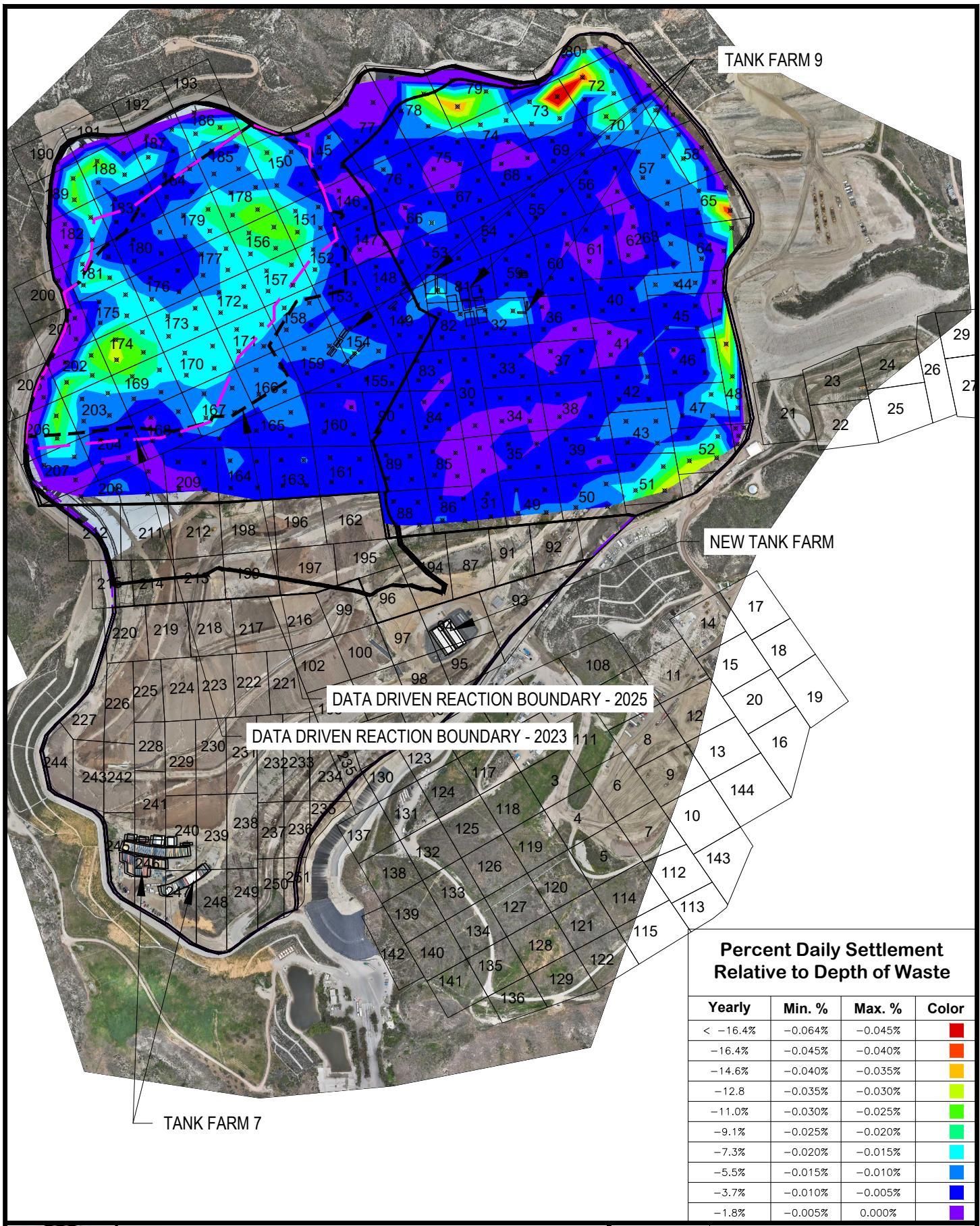
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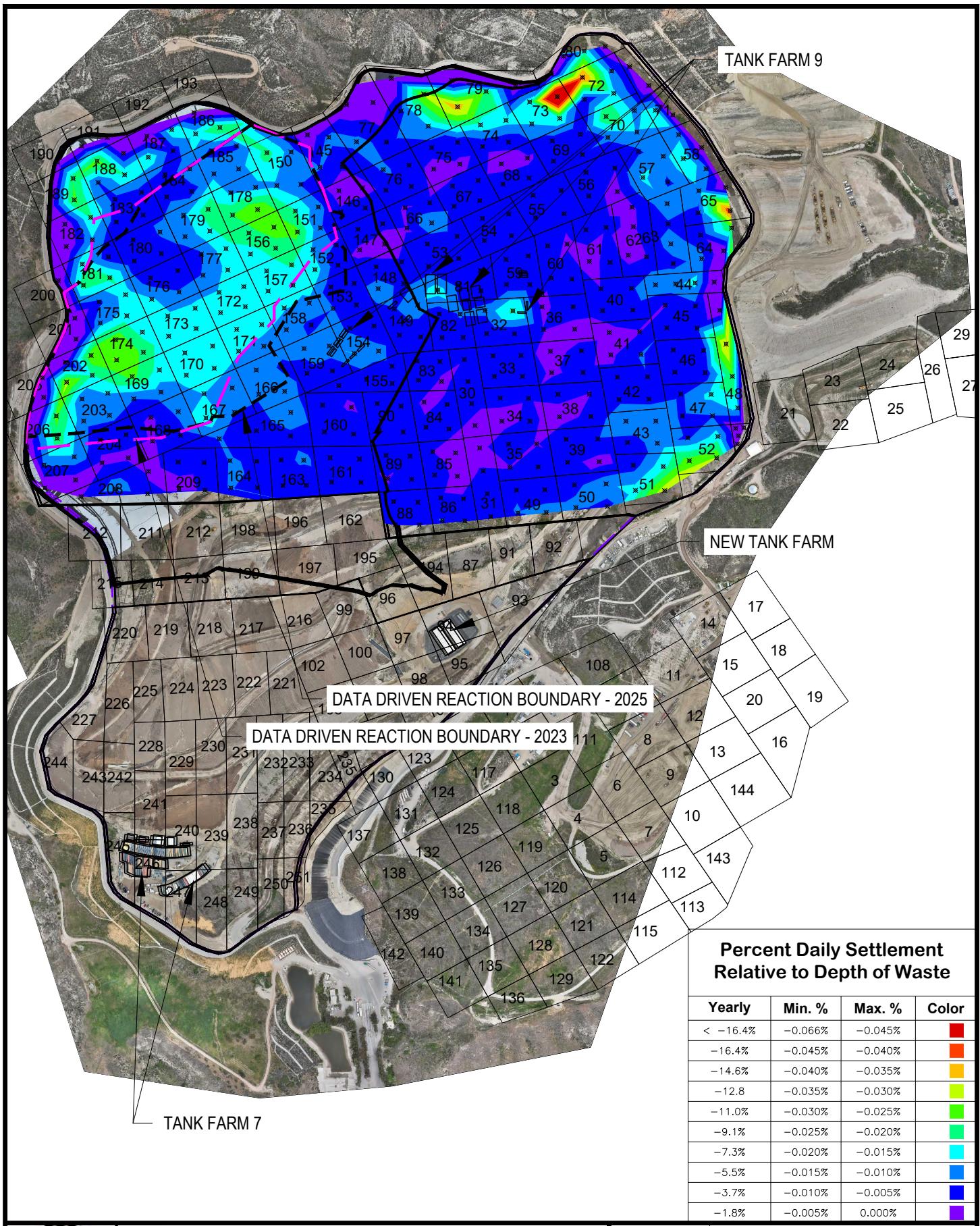
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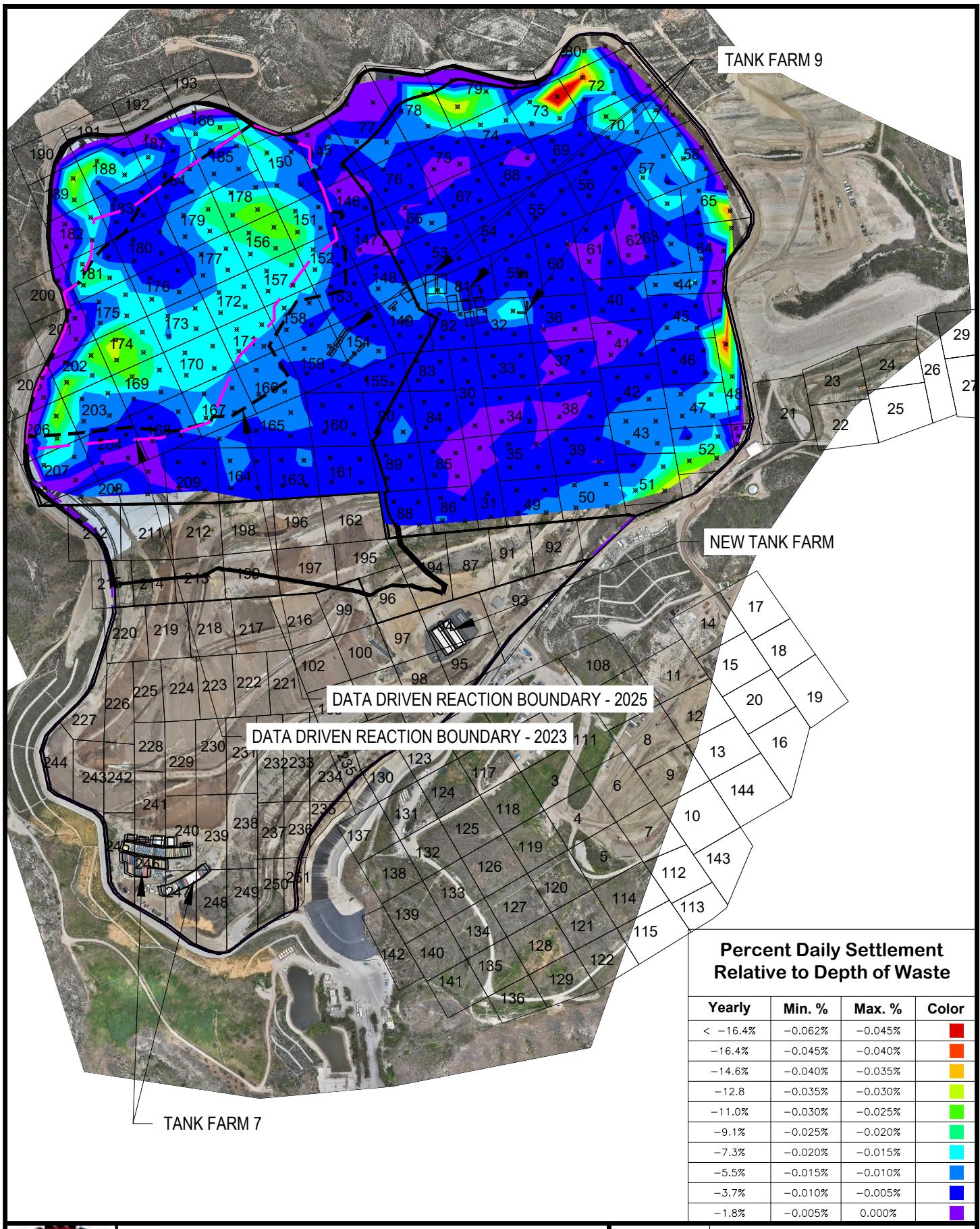
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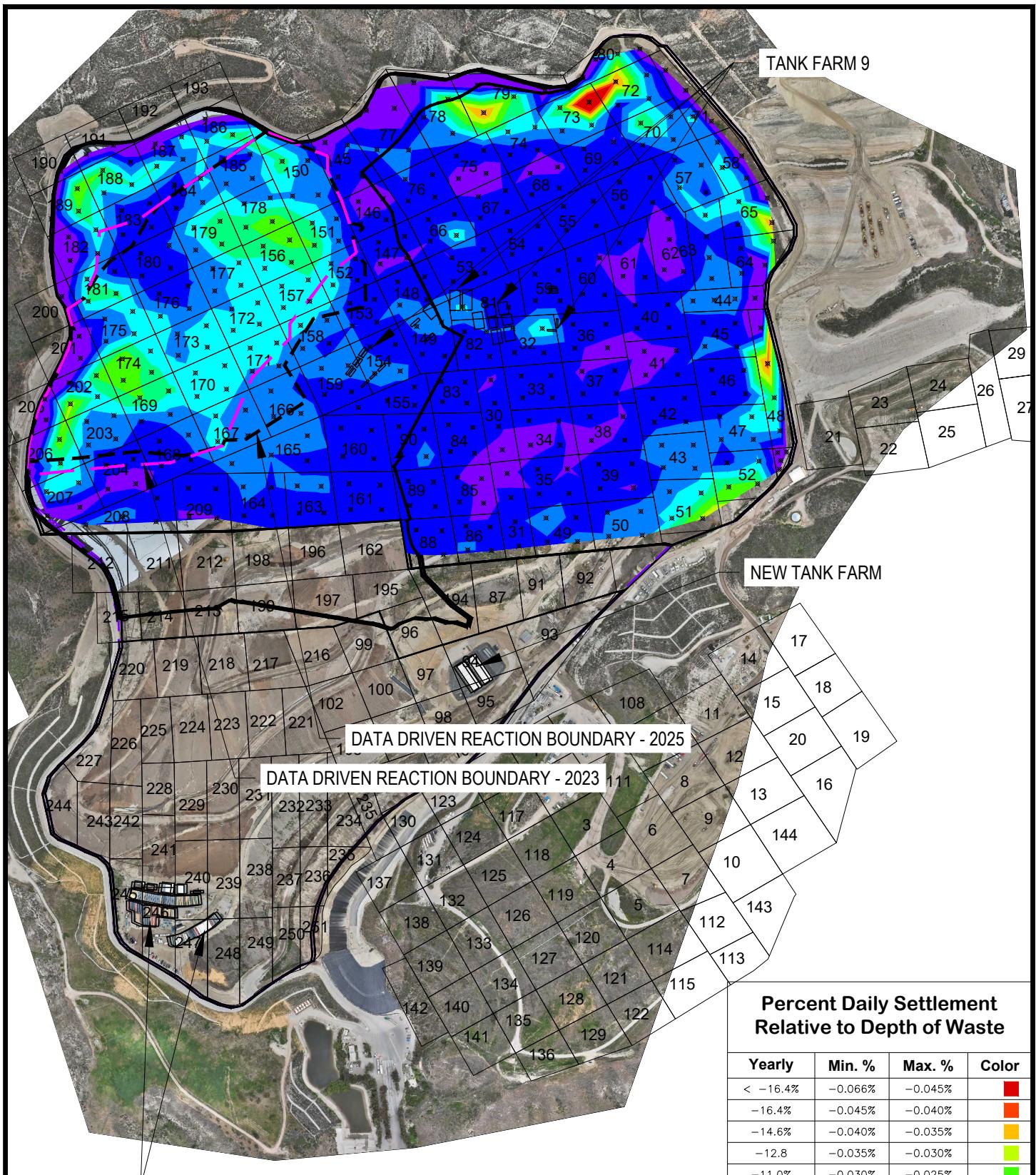
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Revision: -

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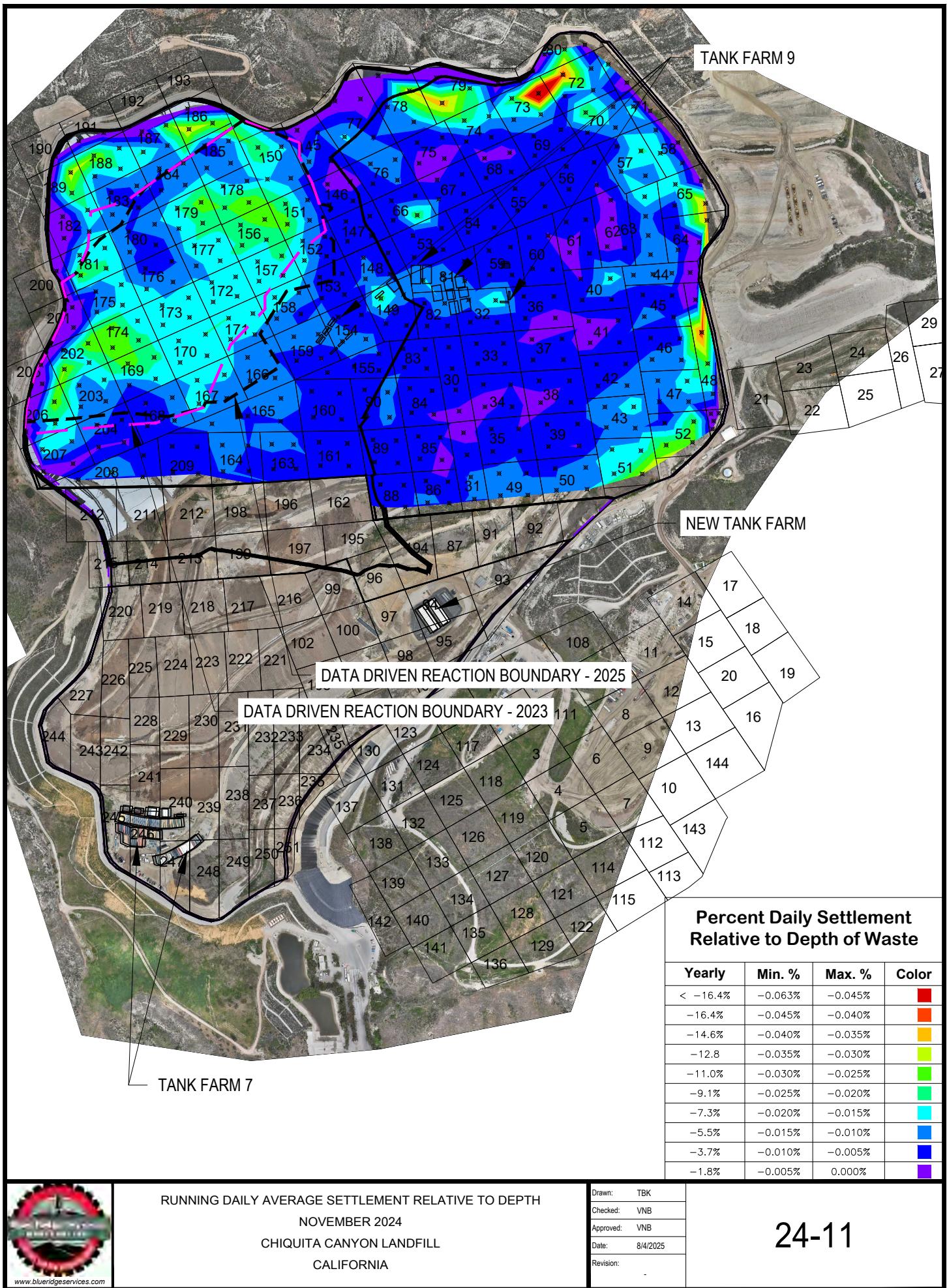
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-12.8	-0.035%	-0.030%	Light Green
-11.0%	-0.030%	-0.025%	Green
-9.1%	-0.025%	-0.020%	Light Blue
-7.3%	-0.020%	-0.015%	Blue
-5.5%	-0.015%	-0.010%	Dark Blue
-3.7%	-0.010%	-0.005%	Dark Blue
-1.8%	-0.005%	0.000%	Dark Blue



RUNNING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
OCTOBER 2024  
CHIQUITA CANYON LANDFILL  
CALIFORNIA

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Revision: -

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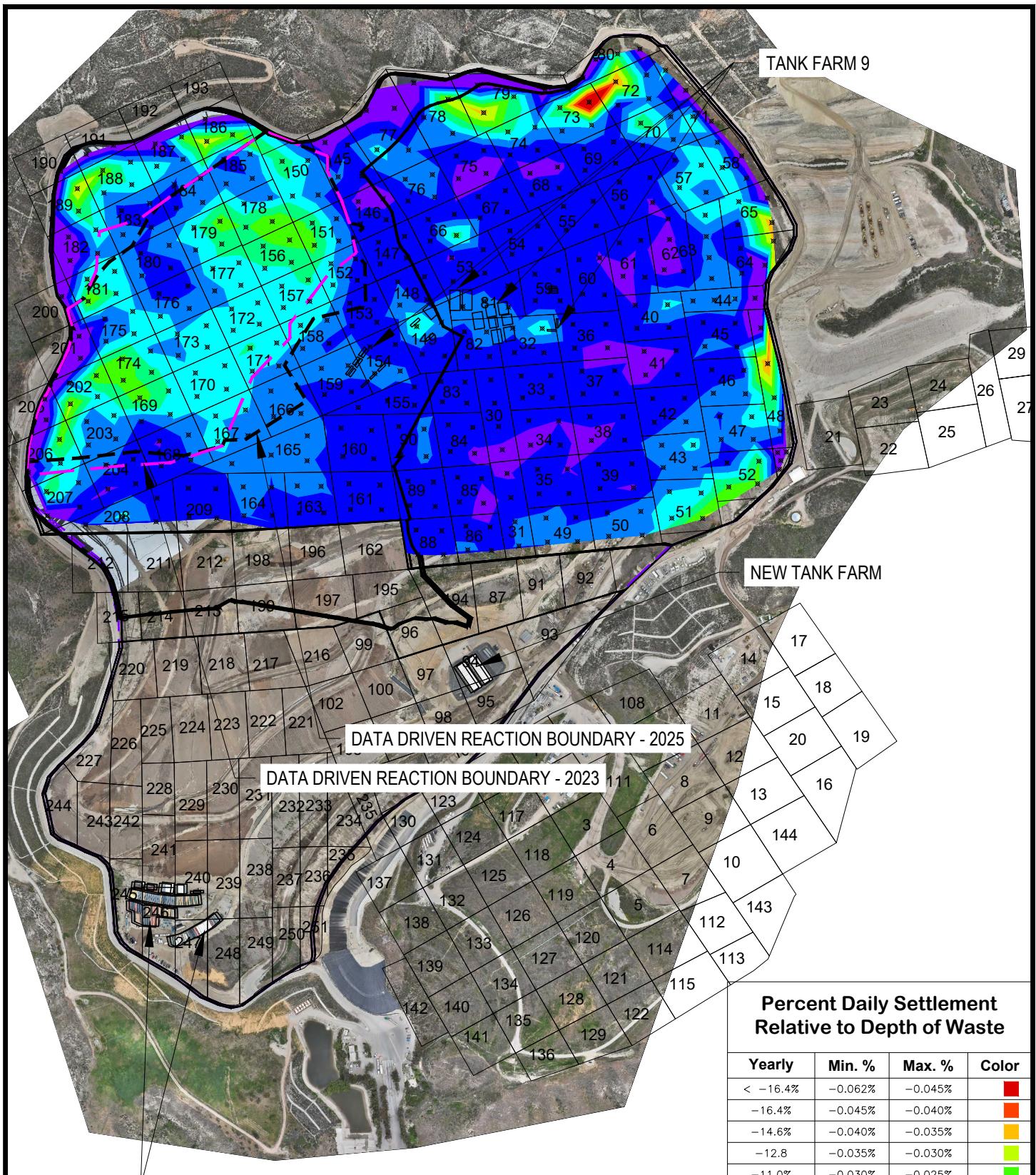
[www.blueridgeservices.com](http://www.blueridgeservices.com)

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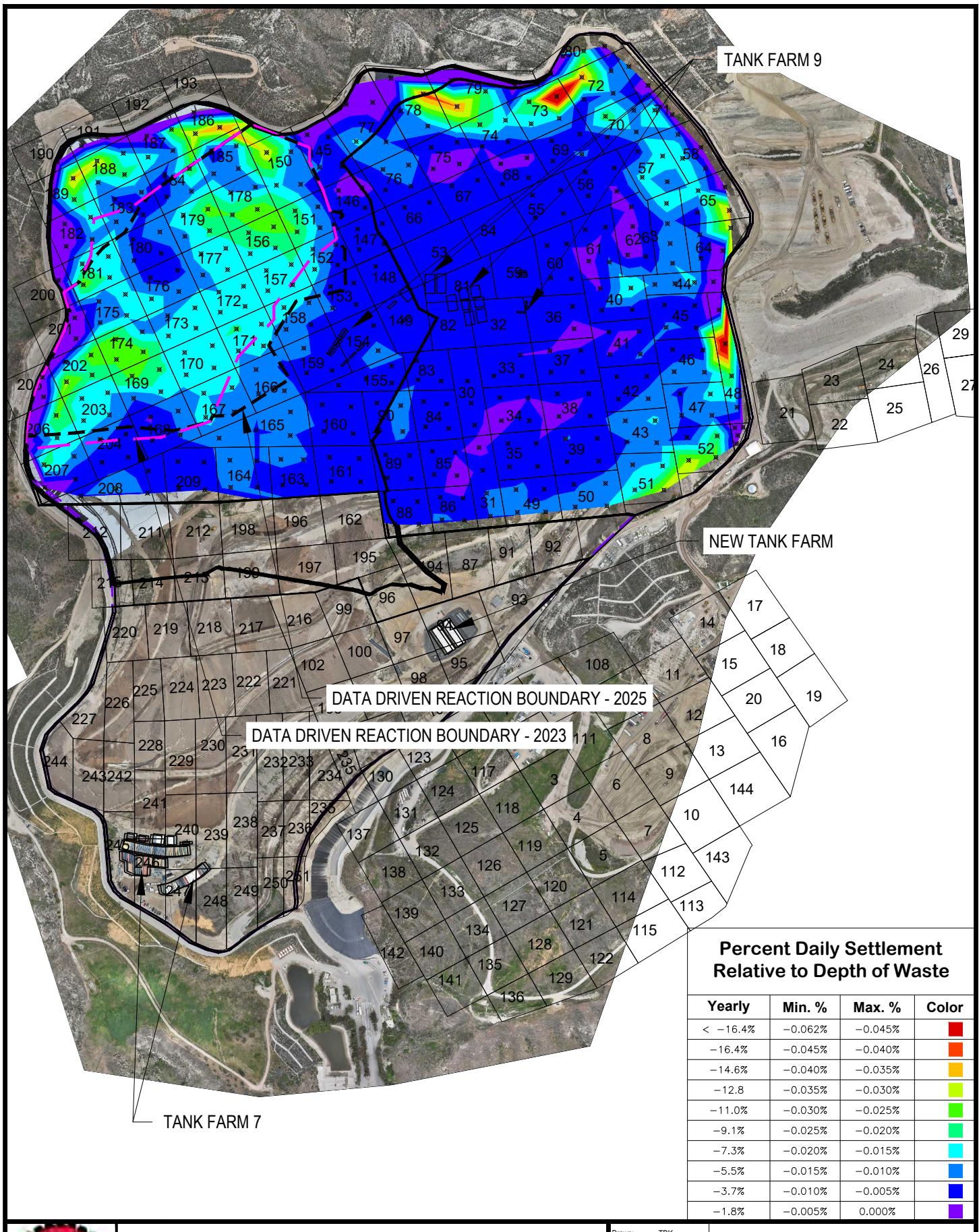
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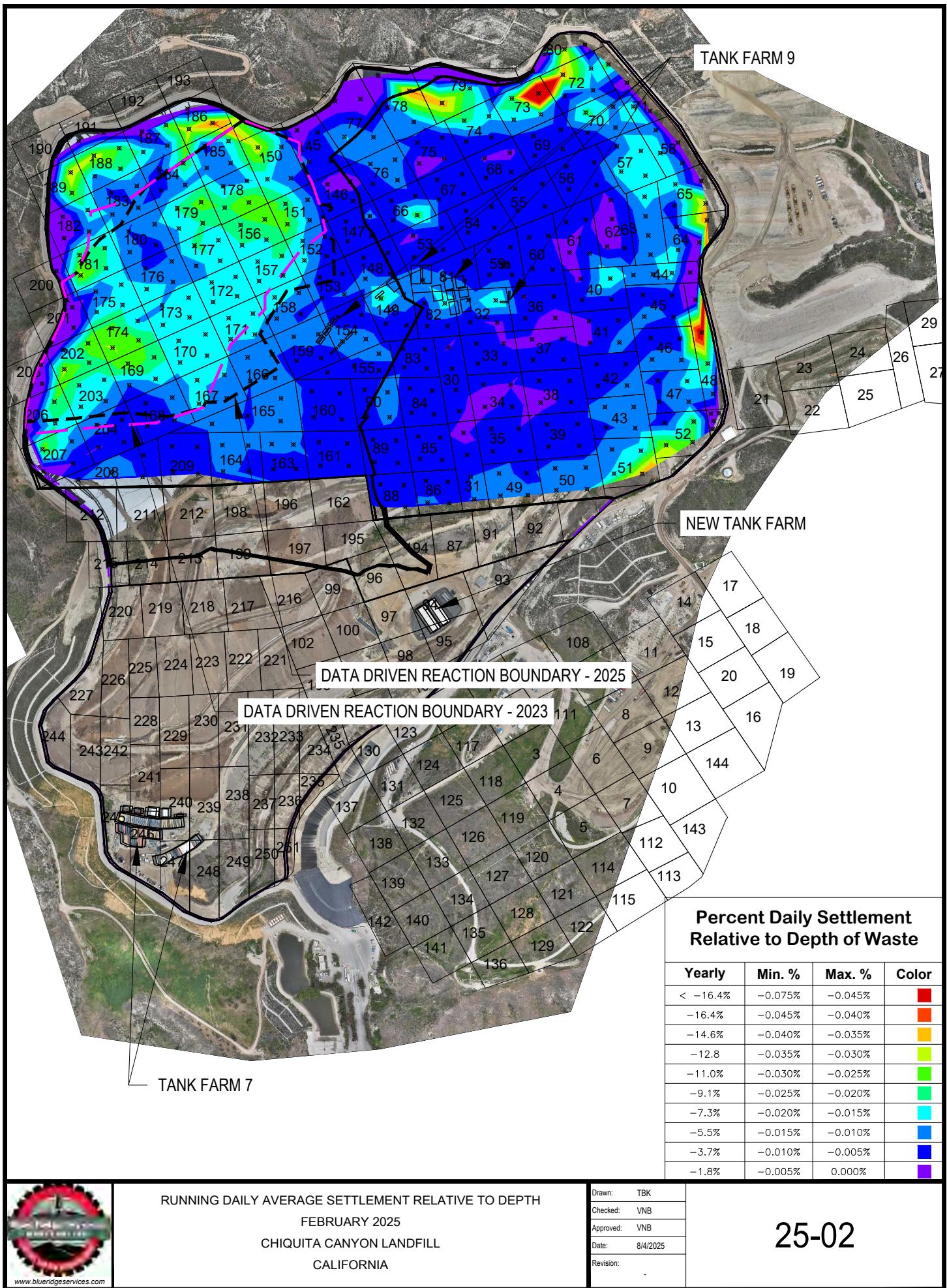
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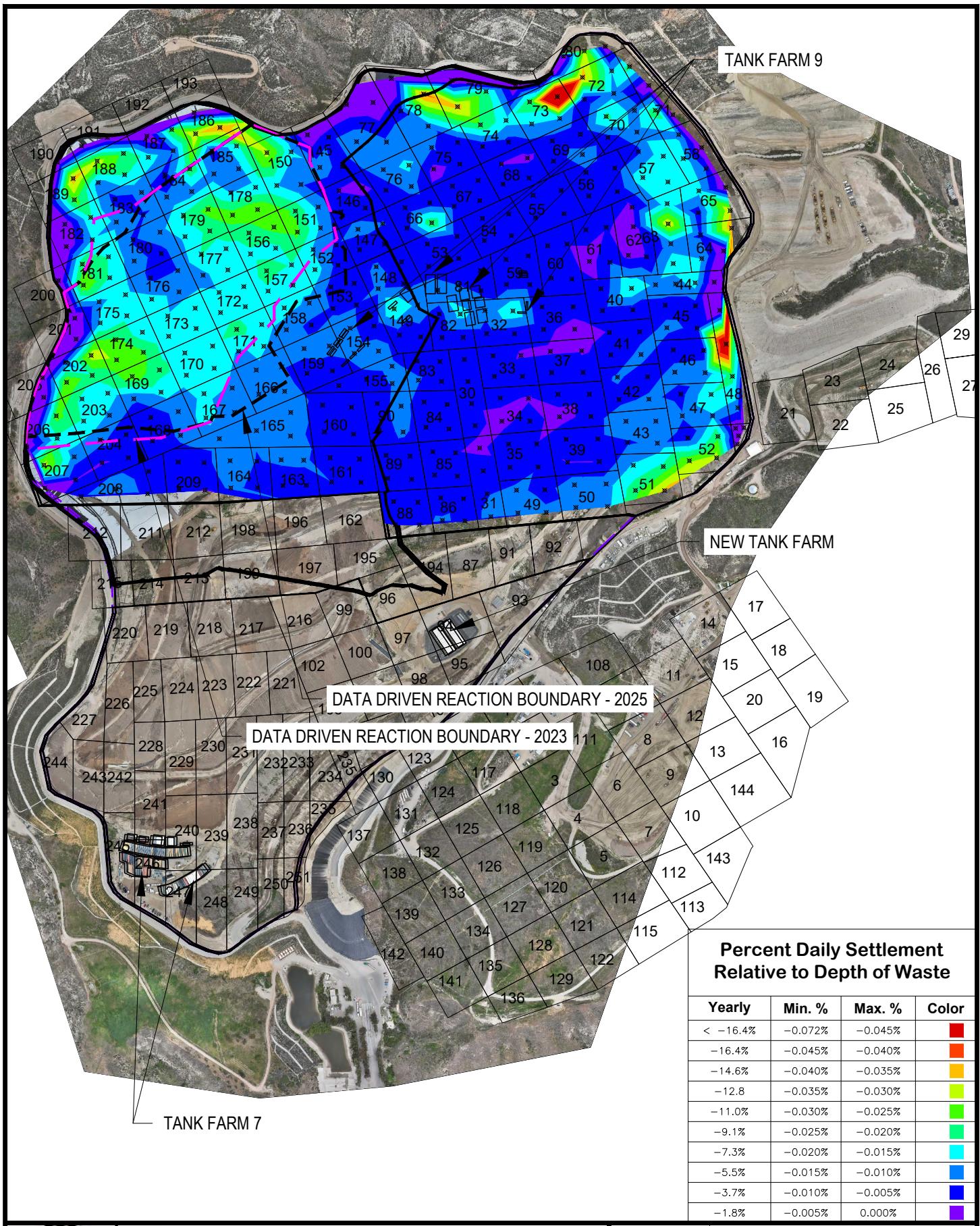


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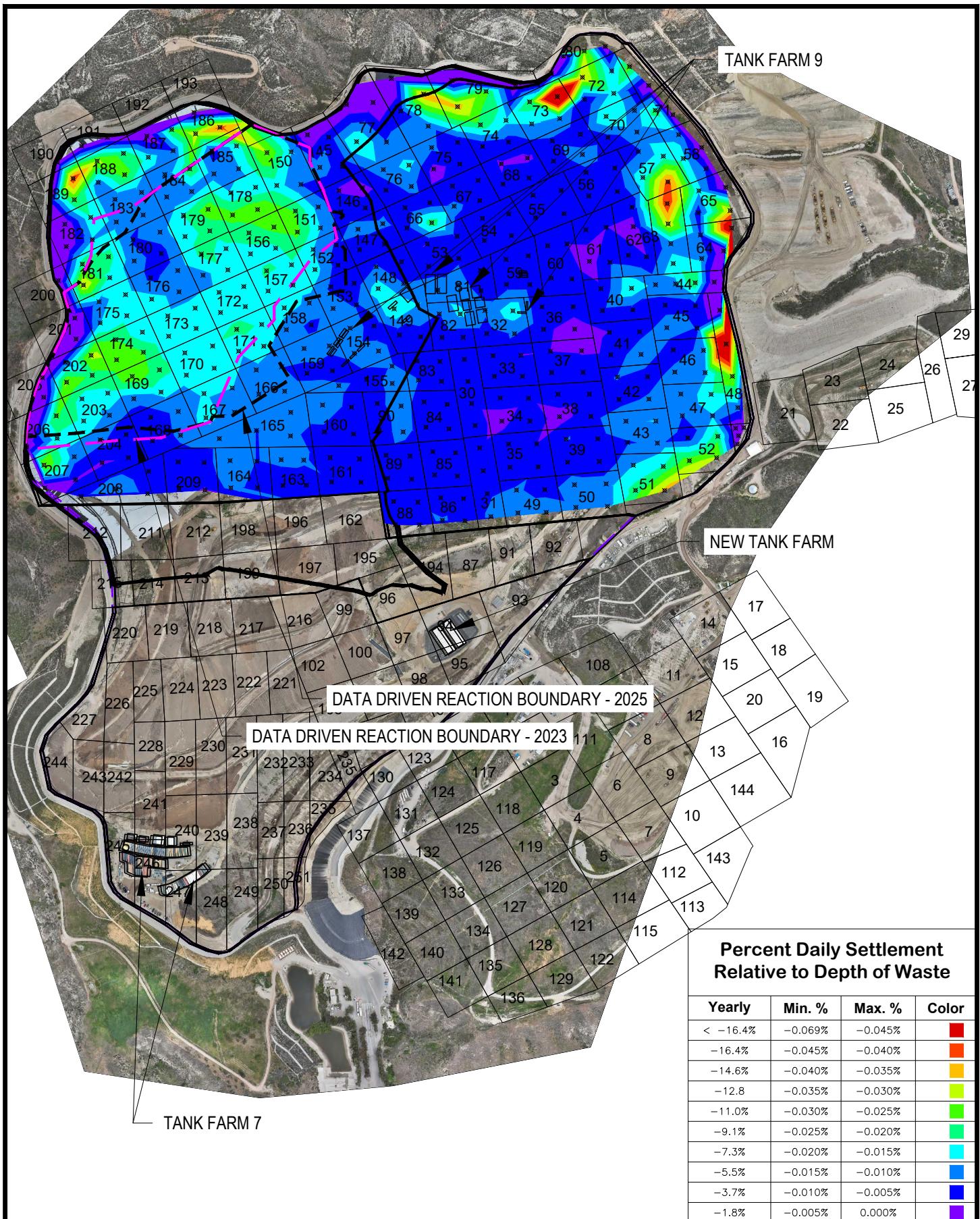




RUNNING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
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CHIQUITA CANYON LANDFILL  
CALIFORNIA

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Date: 8/4/2025  
Revision: -

25-03



### Percent Daily Settlement Relative to Depth of Waste

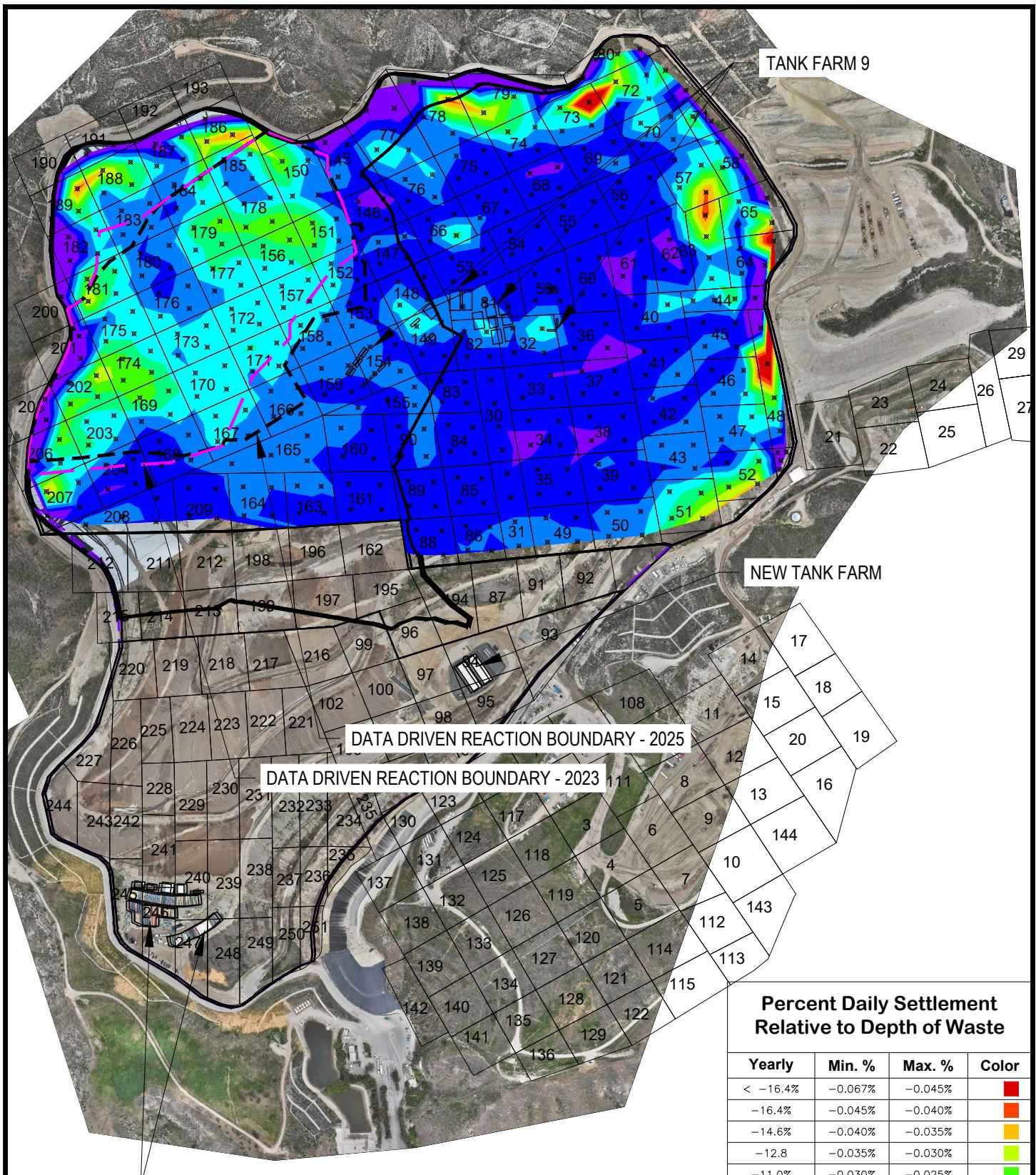
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-12.8	-0.035%	-0.030%	Light Green
-11.0	-0.030%	-0.025%	Green
-9.1	-0.025%	-0.020%	Cyan
-7.3	-0.020%	-0.015%	Light Blue
-5.5	-0.015%	-0.010%	Blue
-3.7	-0.010%	-0.005%	Dark Blue
-1.8	-0.005%	0.000%	Purple



RUNNING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
APRIL 2025  
CHIQUITA CANYON LANDFILL  
CALIFORNIA

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Date: 8/4/2025  
Revision: -

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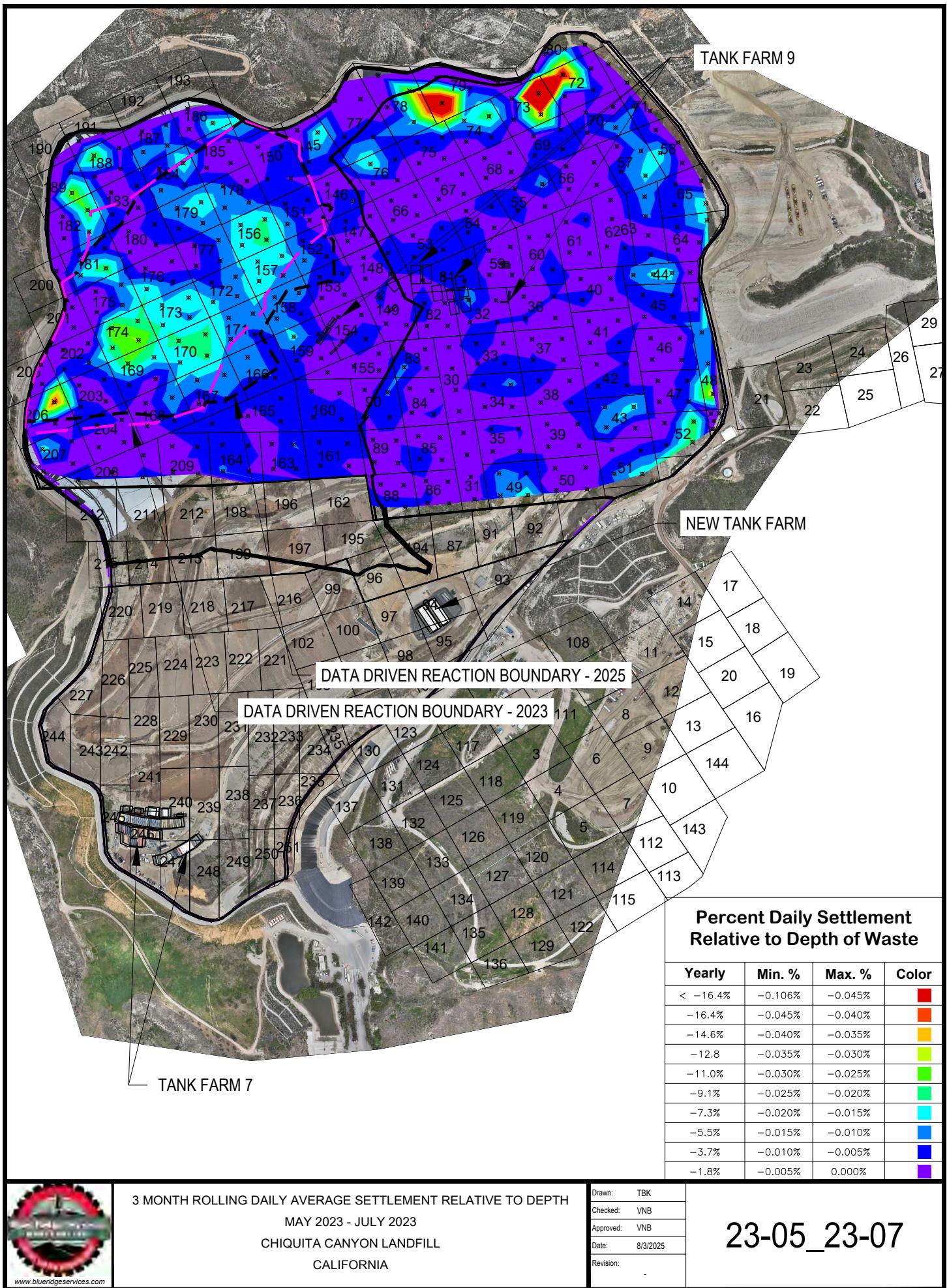
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CHIQUITA CANYON LANDFILL  
CALIFORNIA

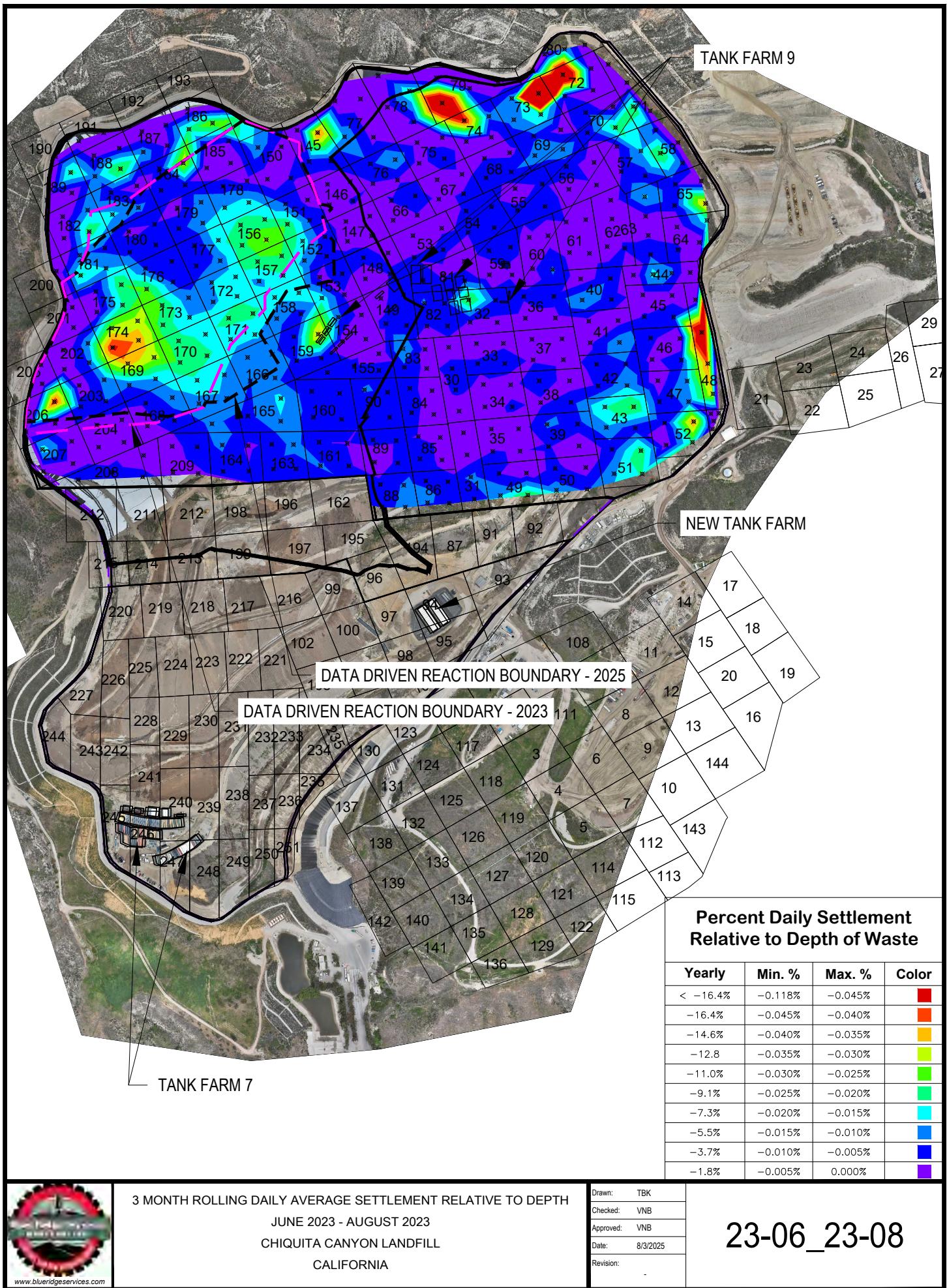
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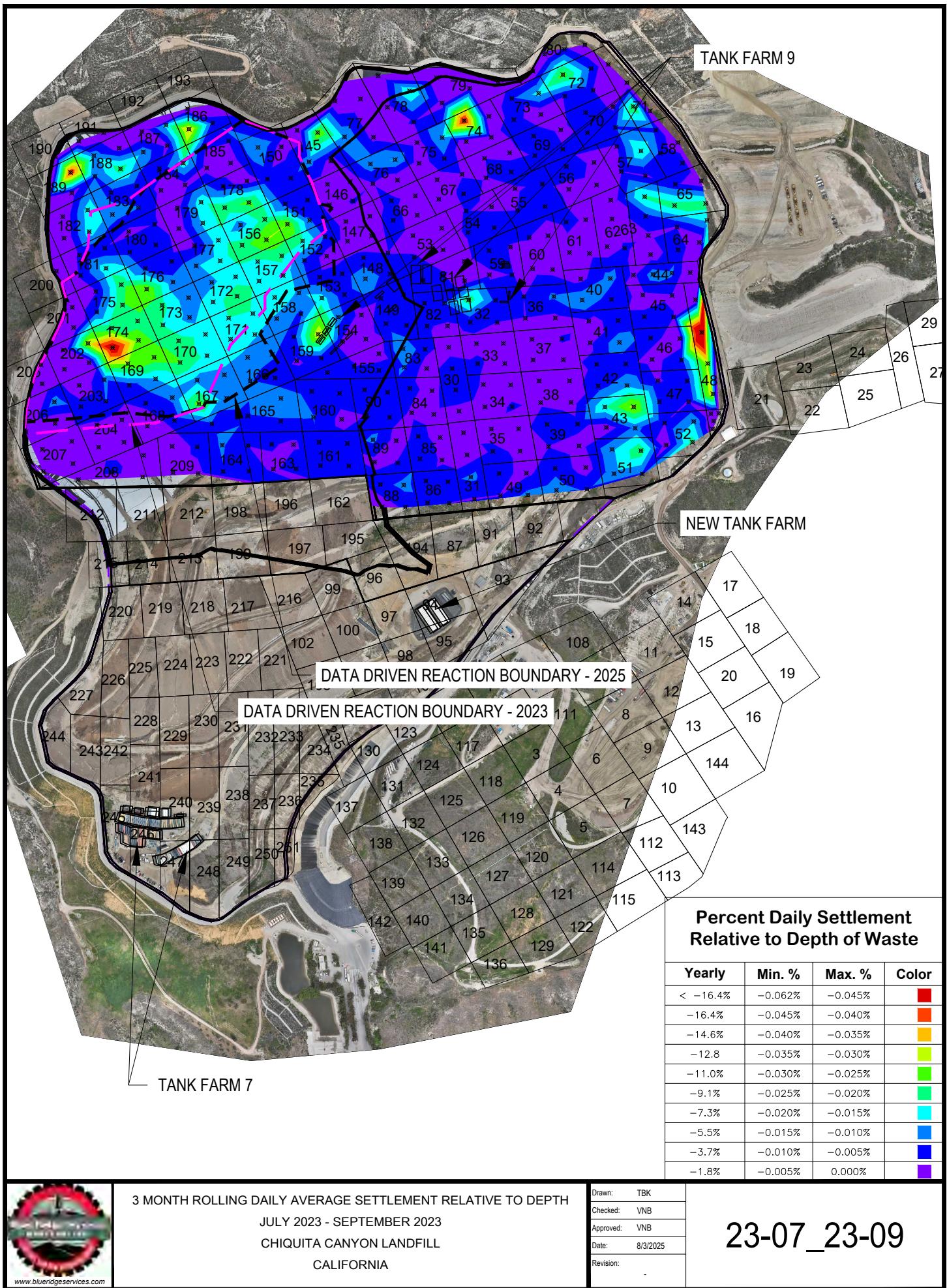
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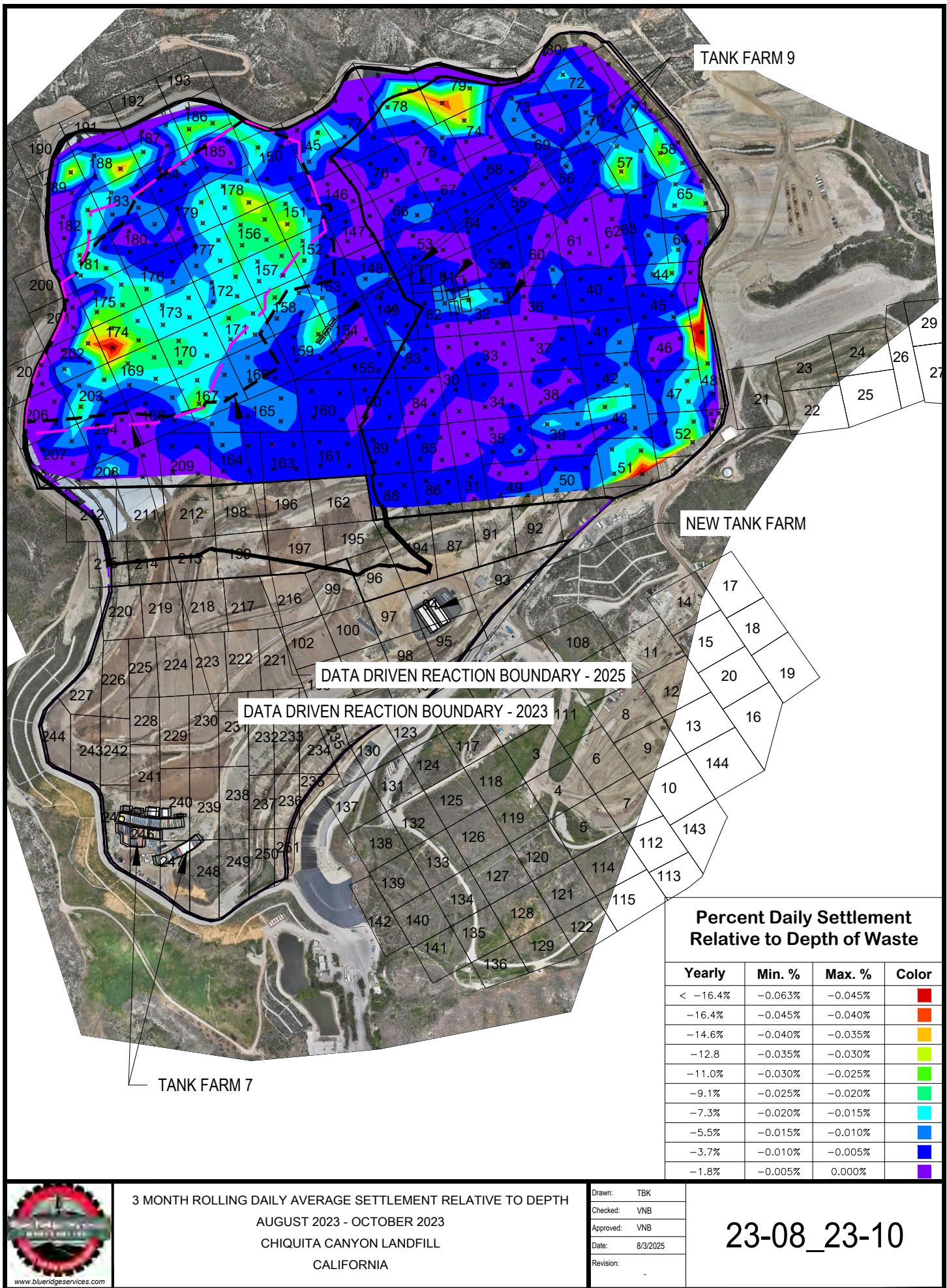
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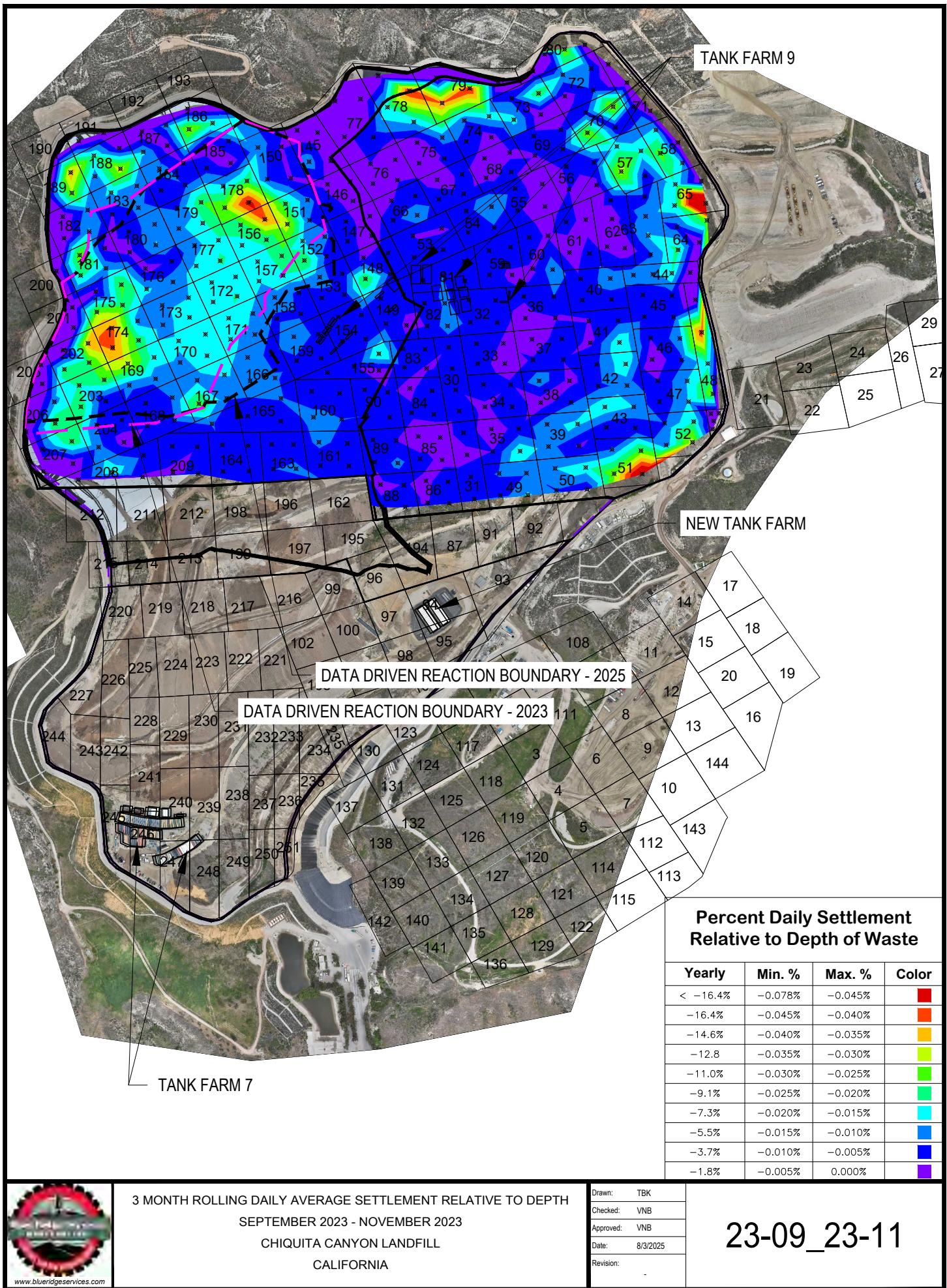
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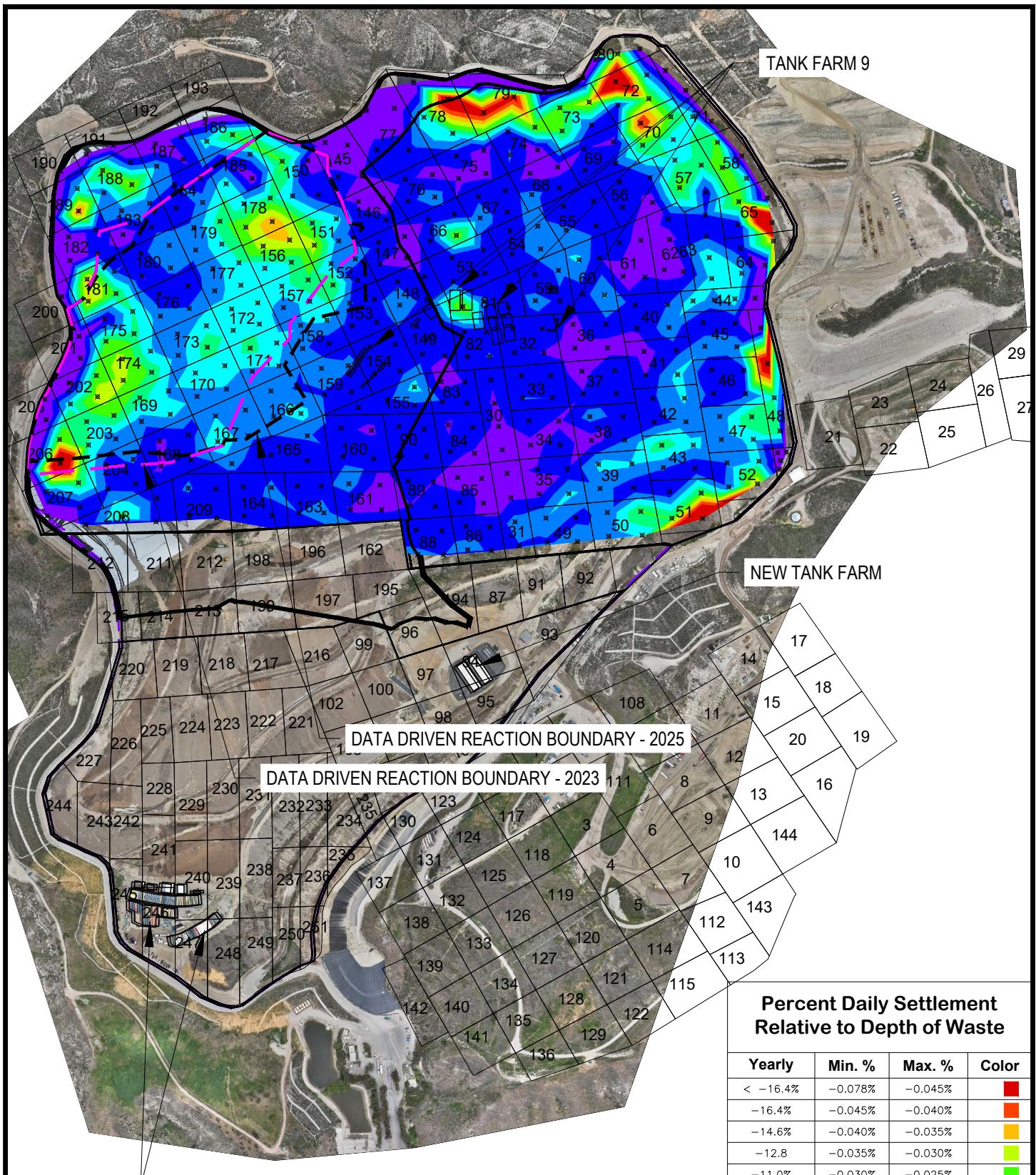












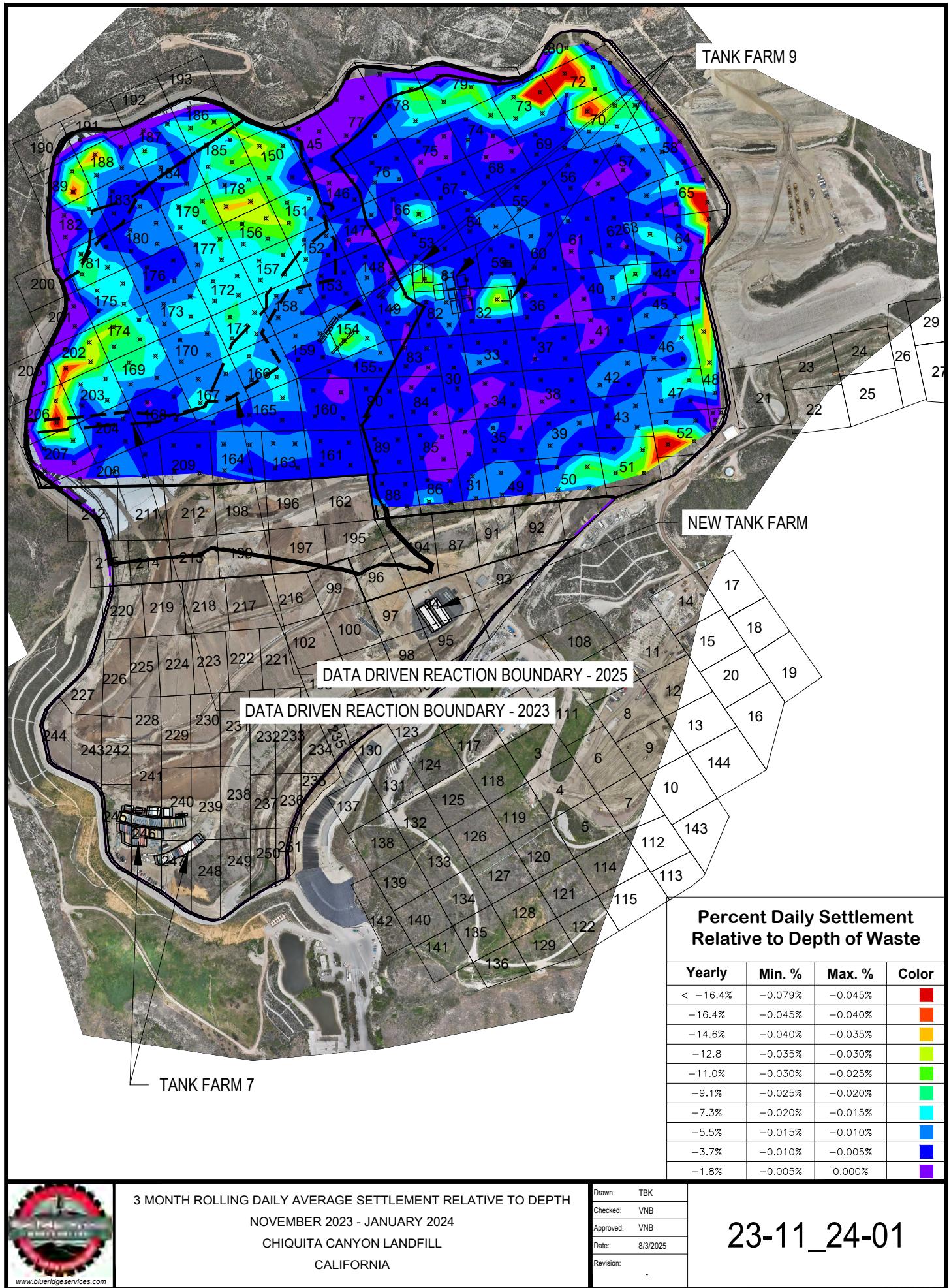
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-14.6%	-0.040%	-0.035%	Yellow
-12.8	-0.035%	-0.030%	Light Green
-11.0%	-0.030%	-0.025%	Green
-9.1%	-0.025%	-0.020%	Dark Green
-7.3%	-0.020%	-0.015%	Cyan
-5.5%	-0.015%	-0.010%	Blue
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-1.8%	-0.005%	0.000%	Purple

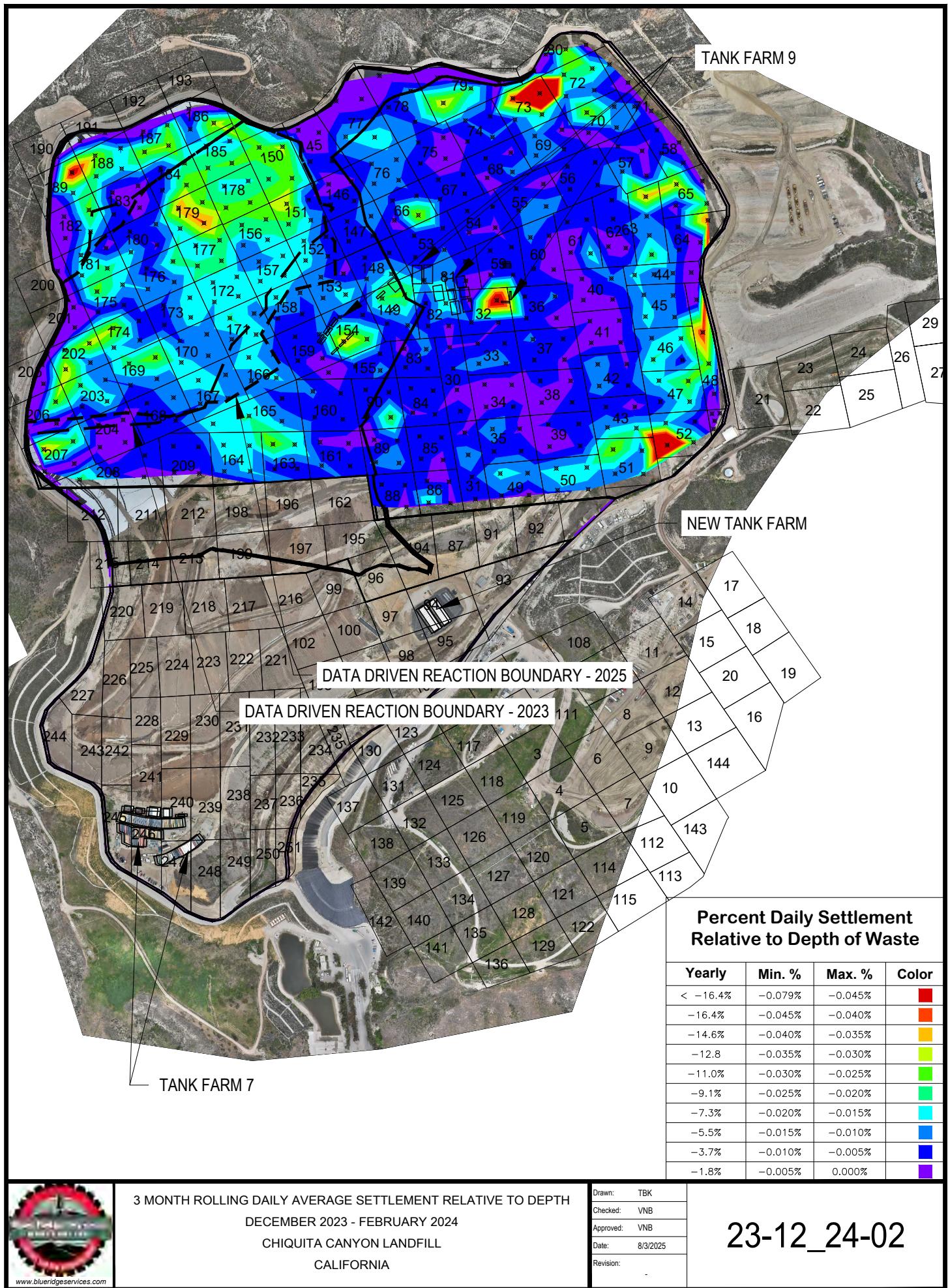


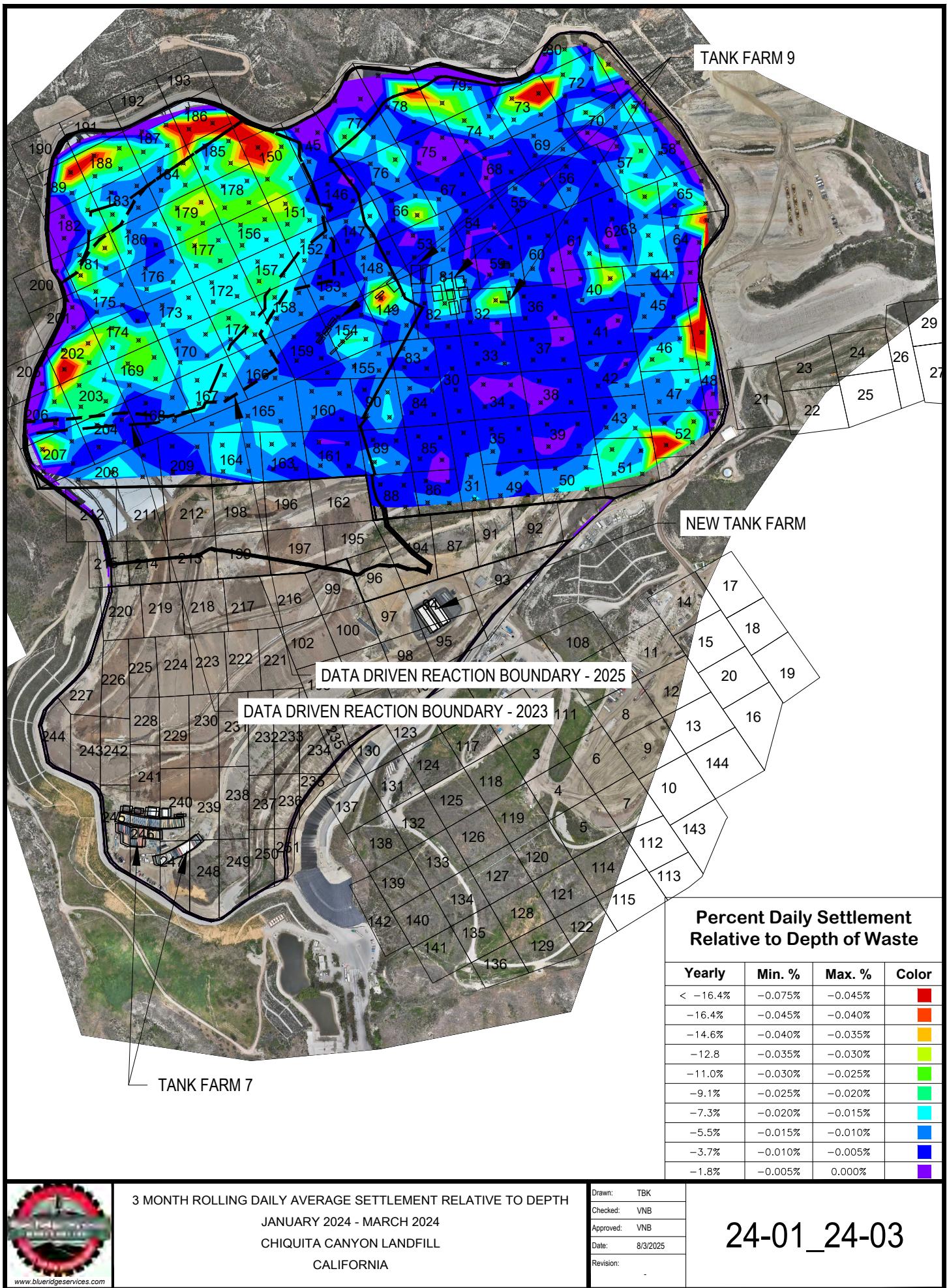
3 MONTH ROLLING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
OCTOBER 2023 - DECEMBER 2023  
CHIQUITA CANYON LANDFILL  
CALIFORNIA

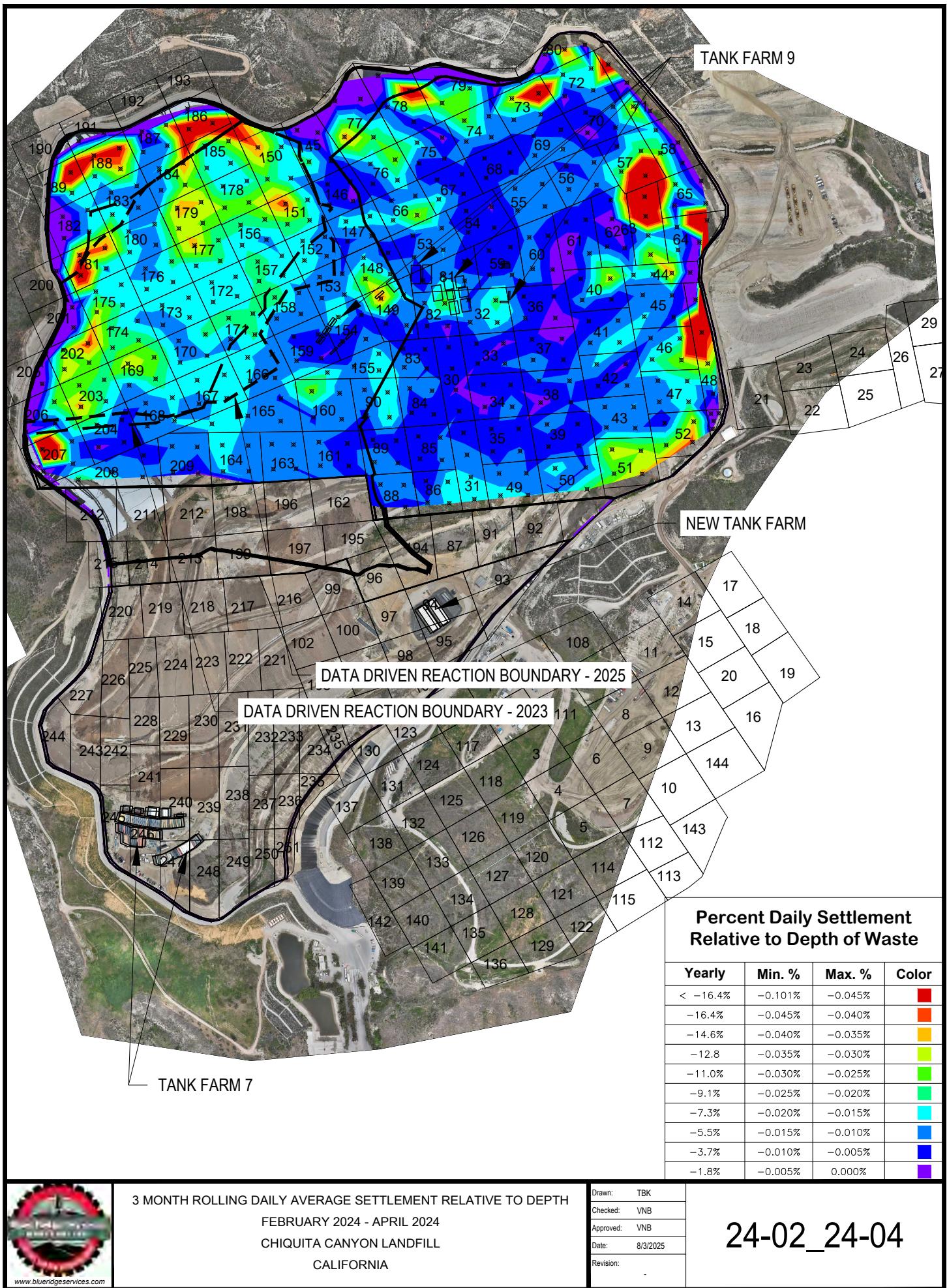
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Revision: -

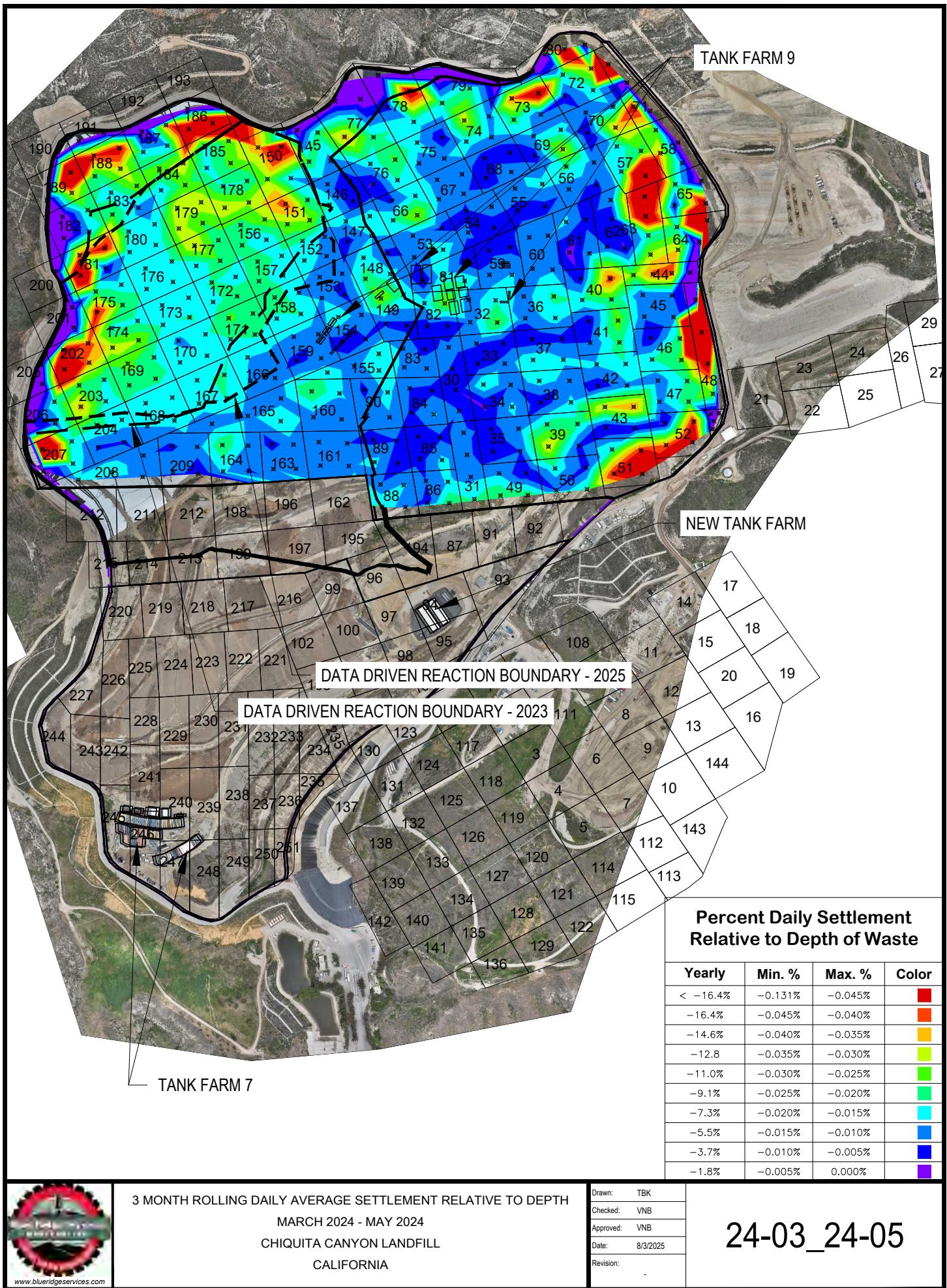
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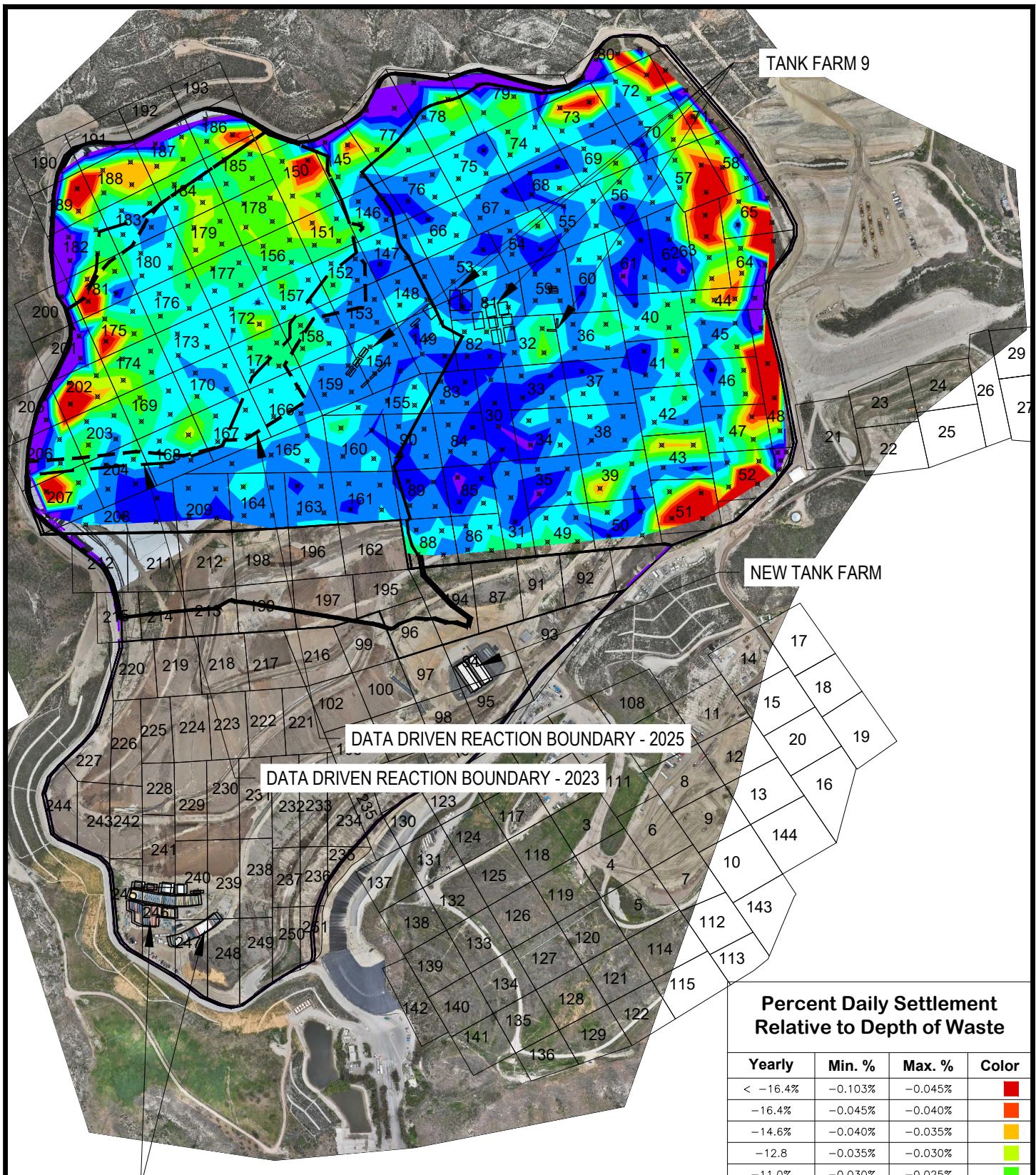








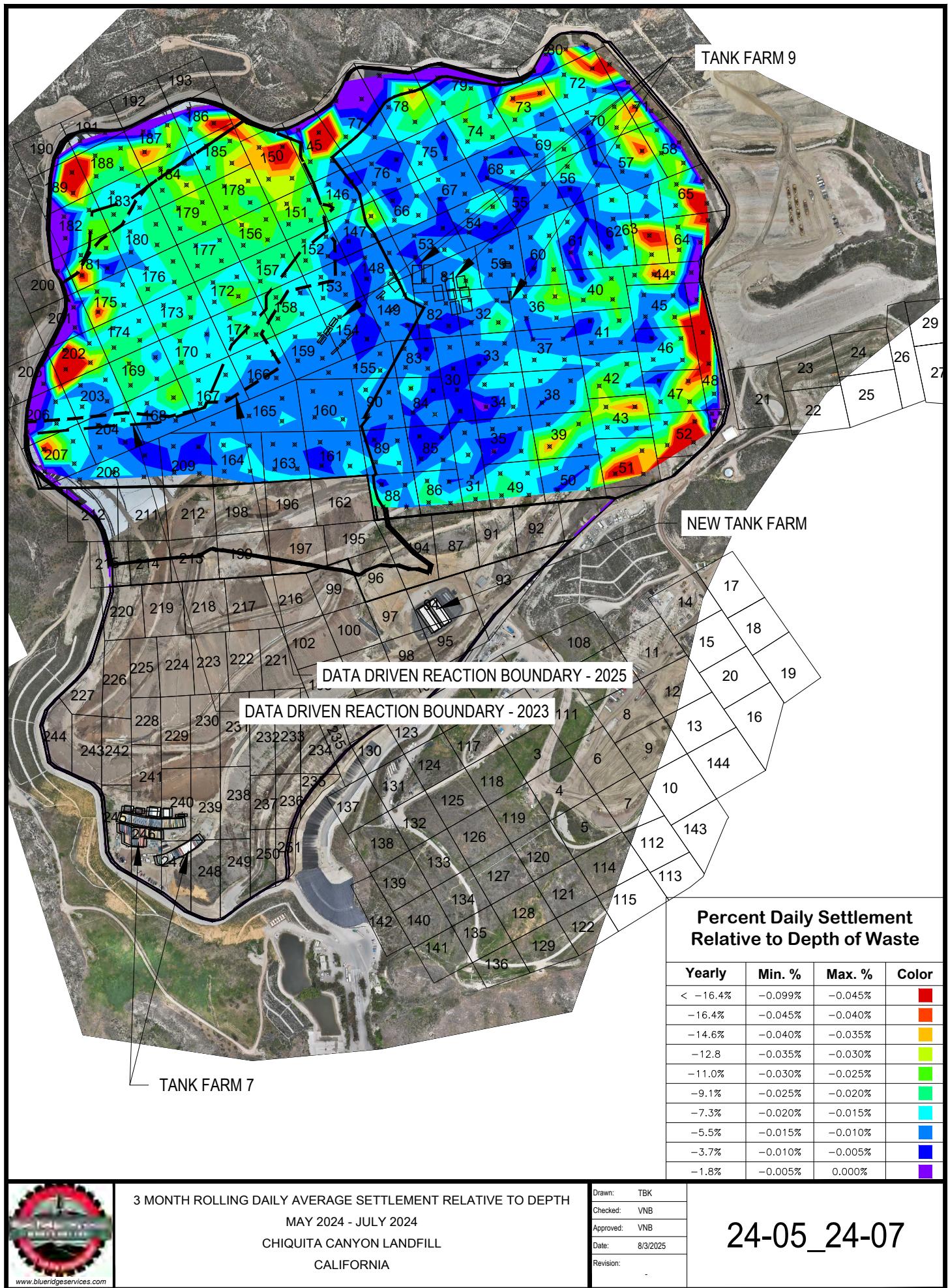


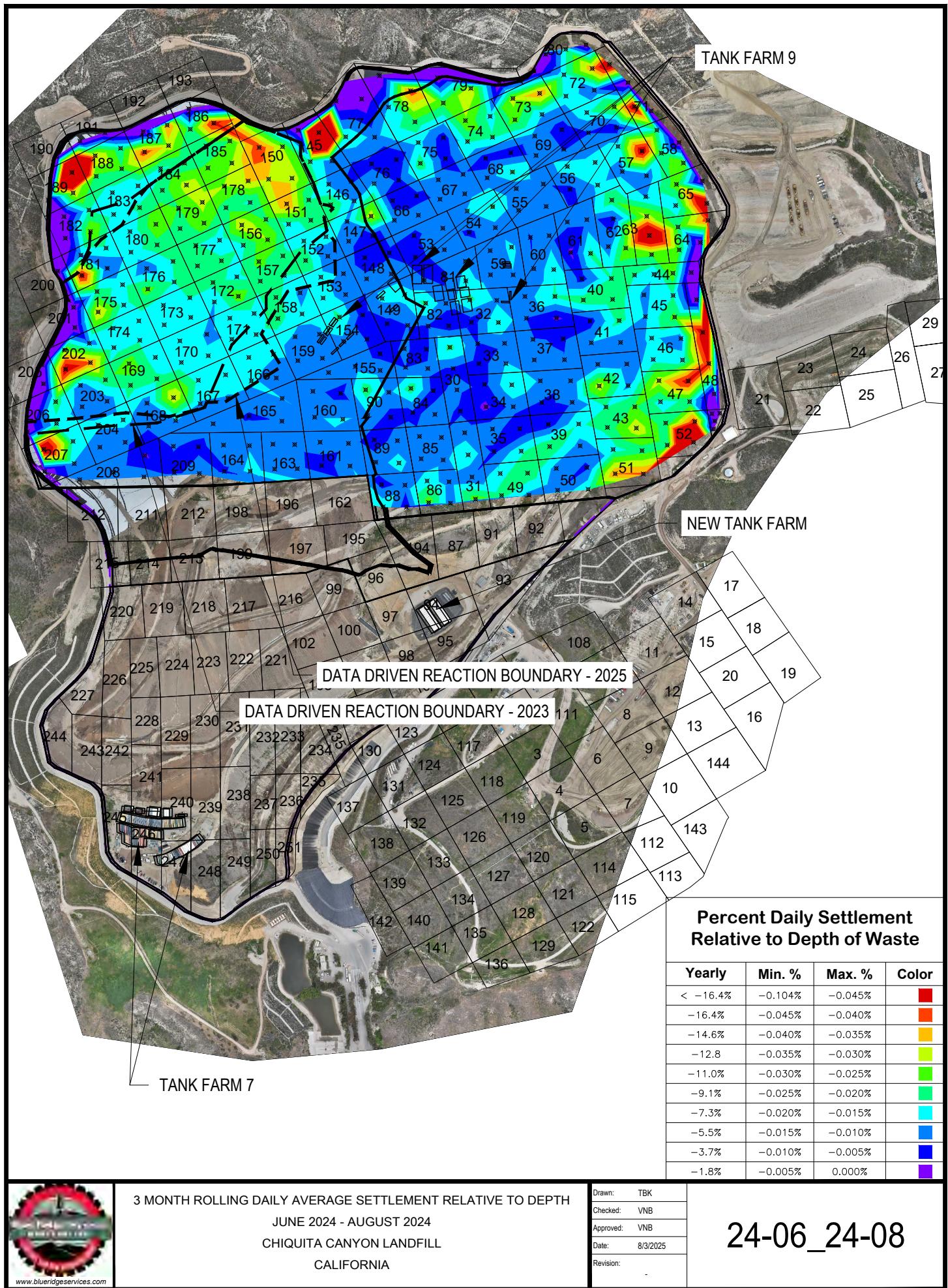


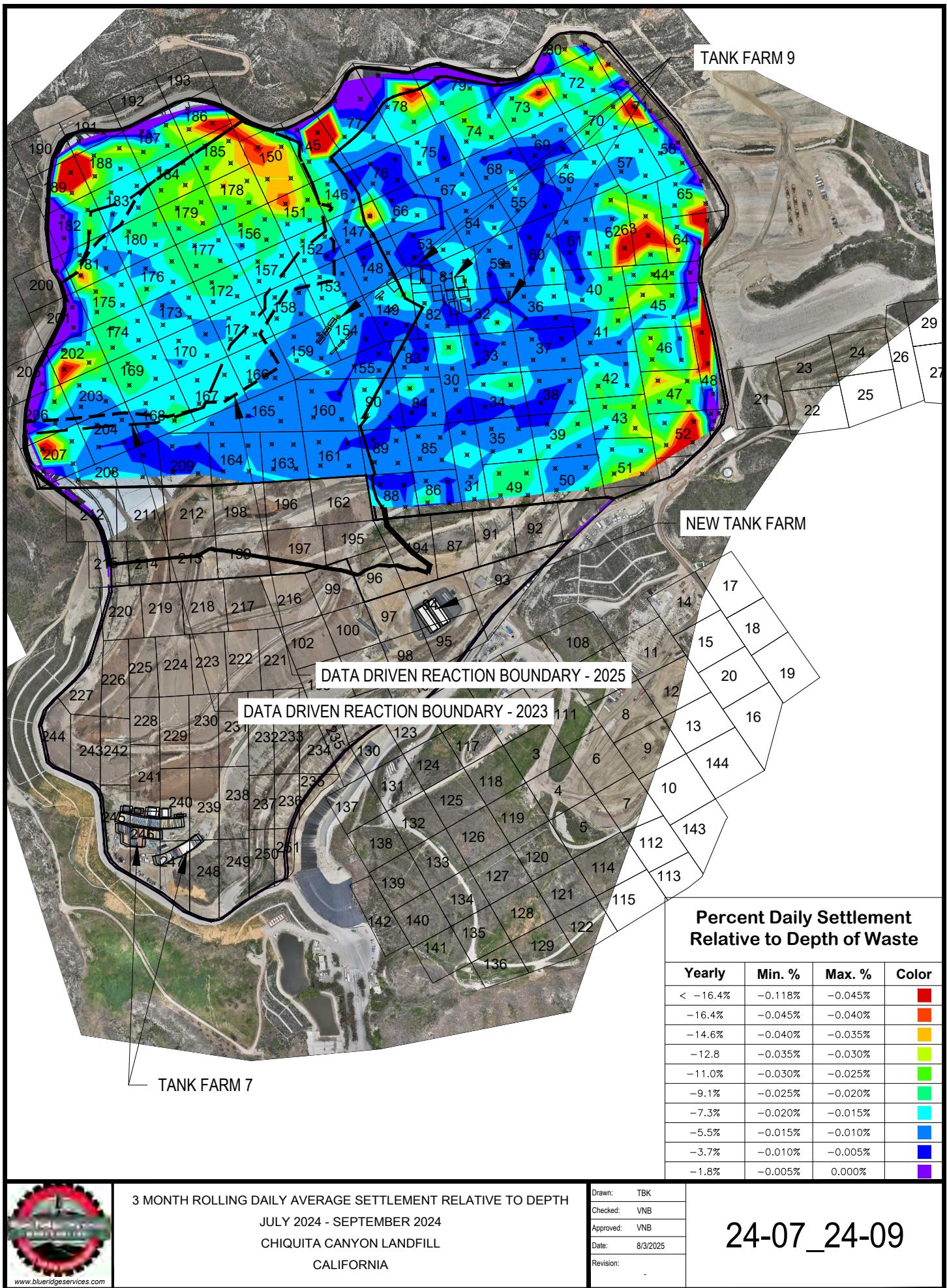
3 MONTH ROLLING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
APRIL 2024 - JUNE 2024  
CHIQUITA CANYON LANDFILL  
CALIFORNIA

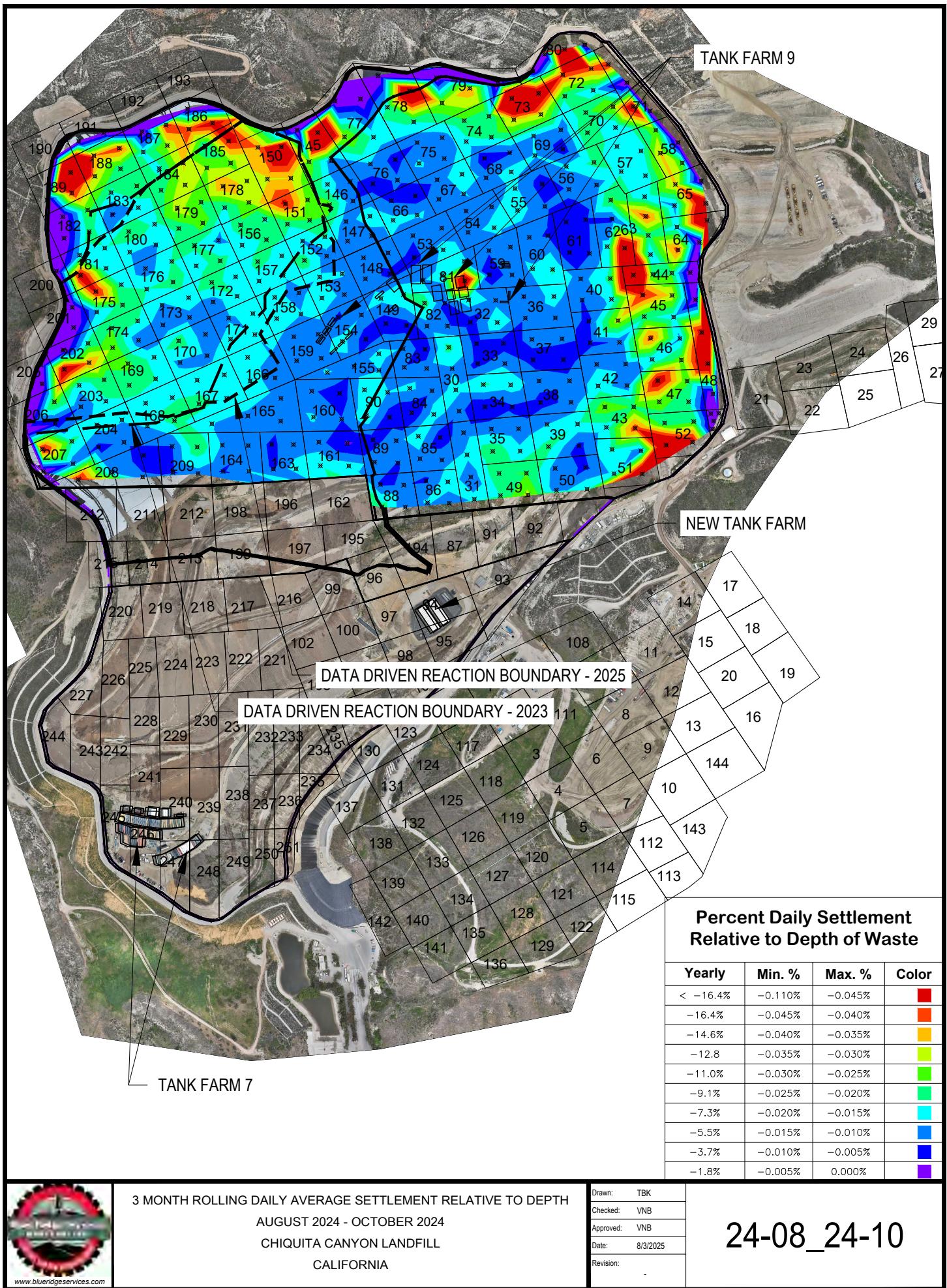
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Checked: VNB  
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Date: 8/3/2025  
Revision: -

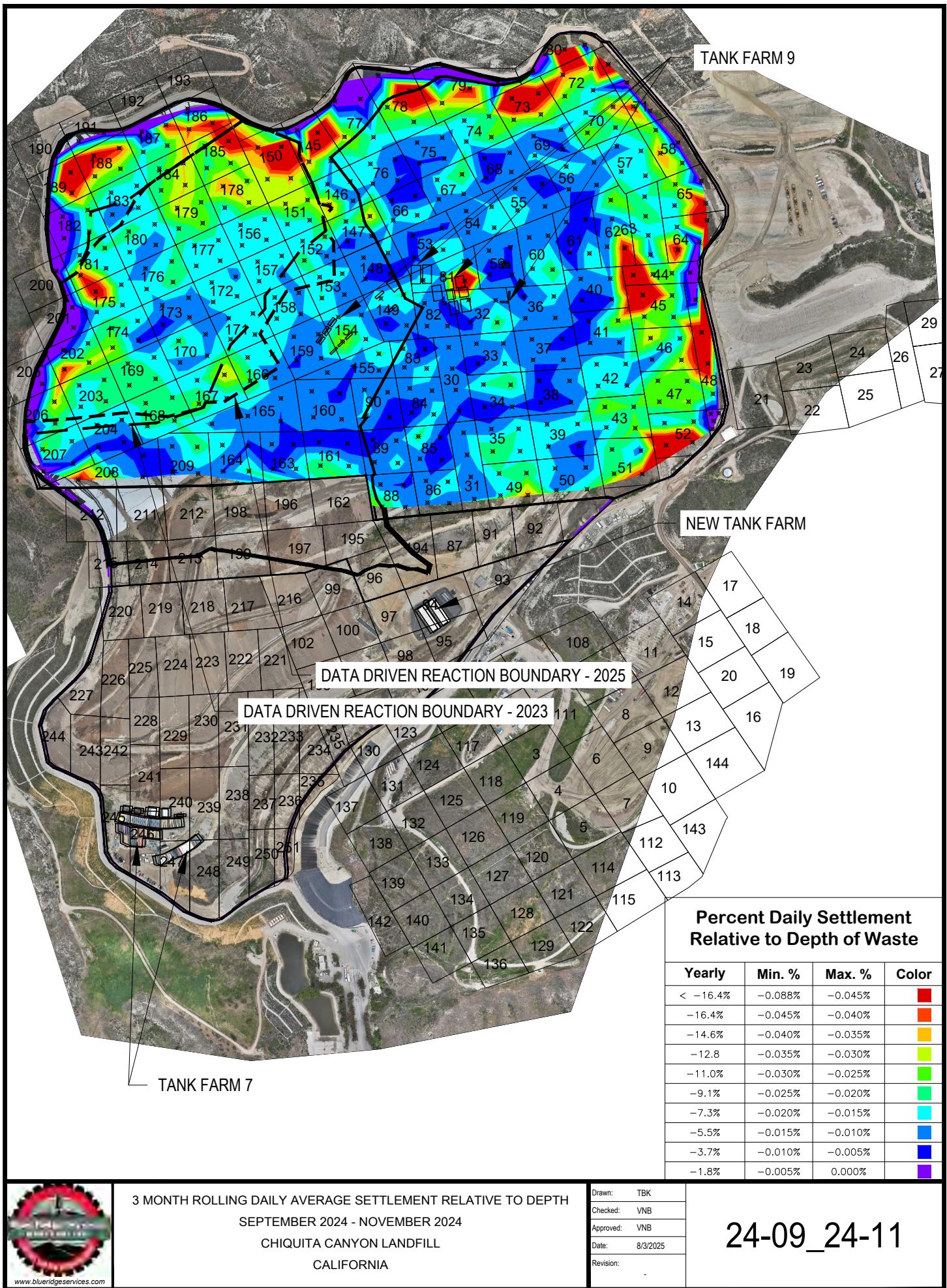
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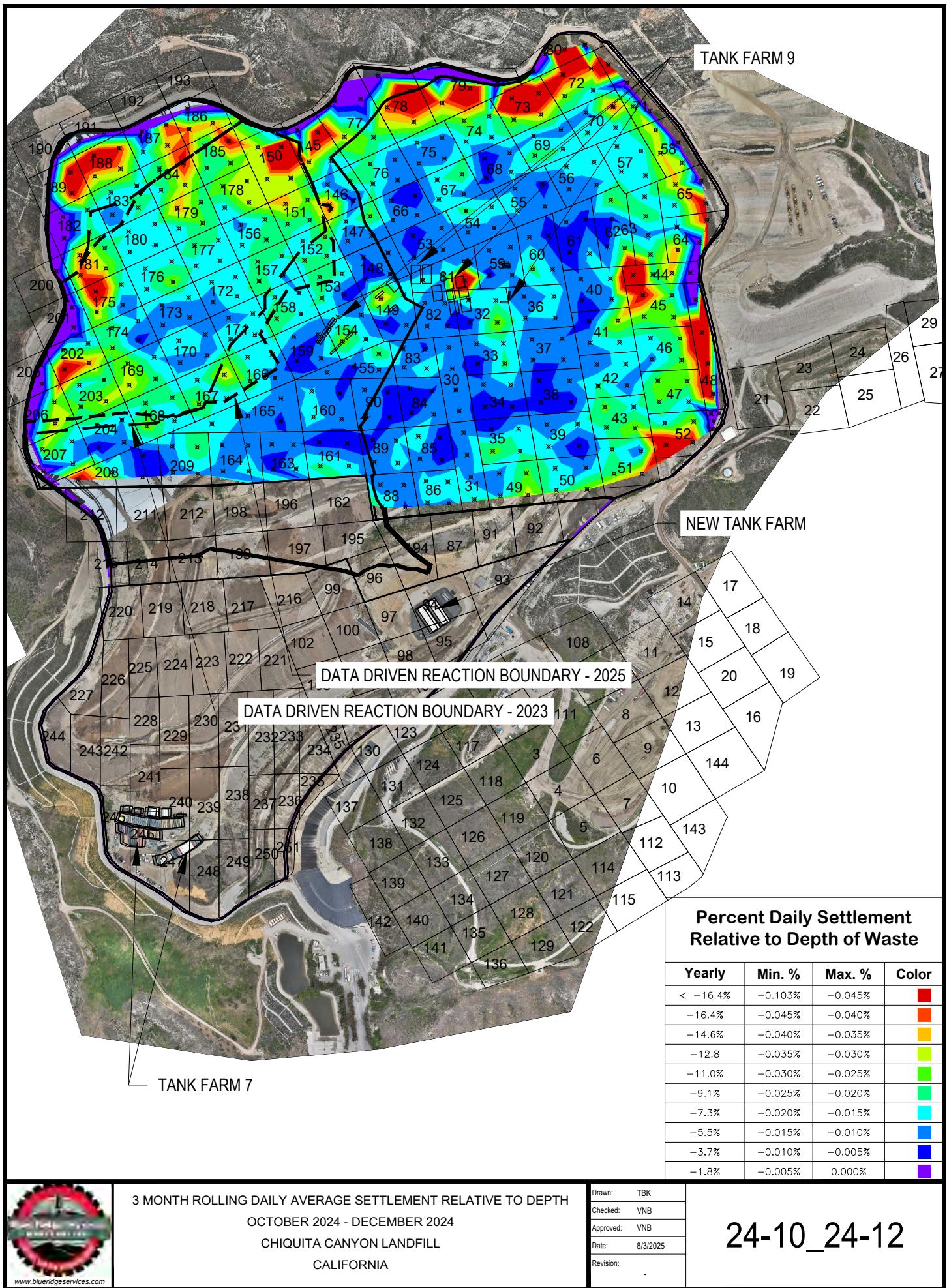


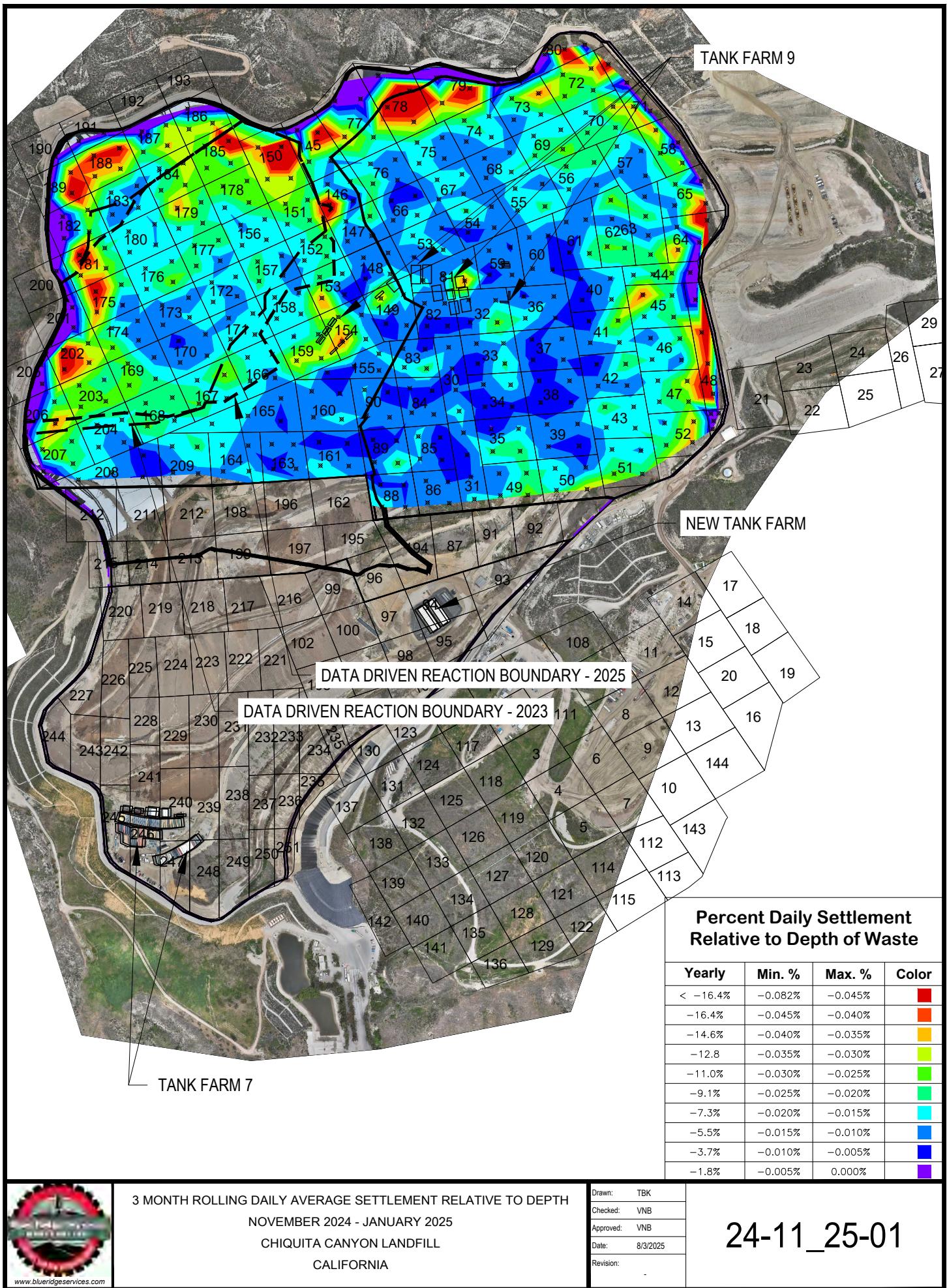


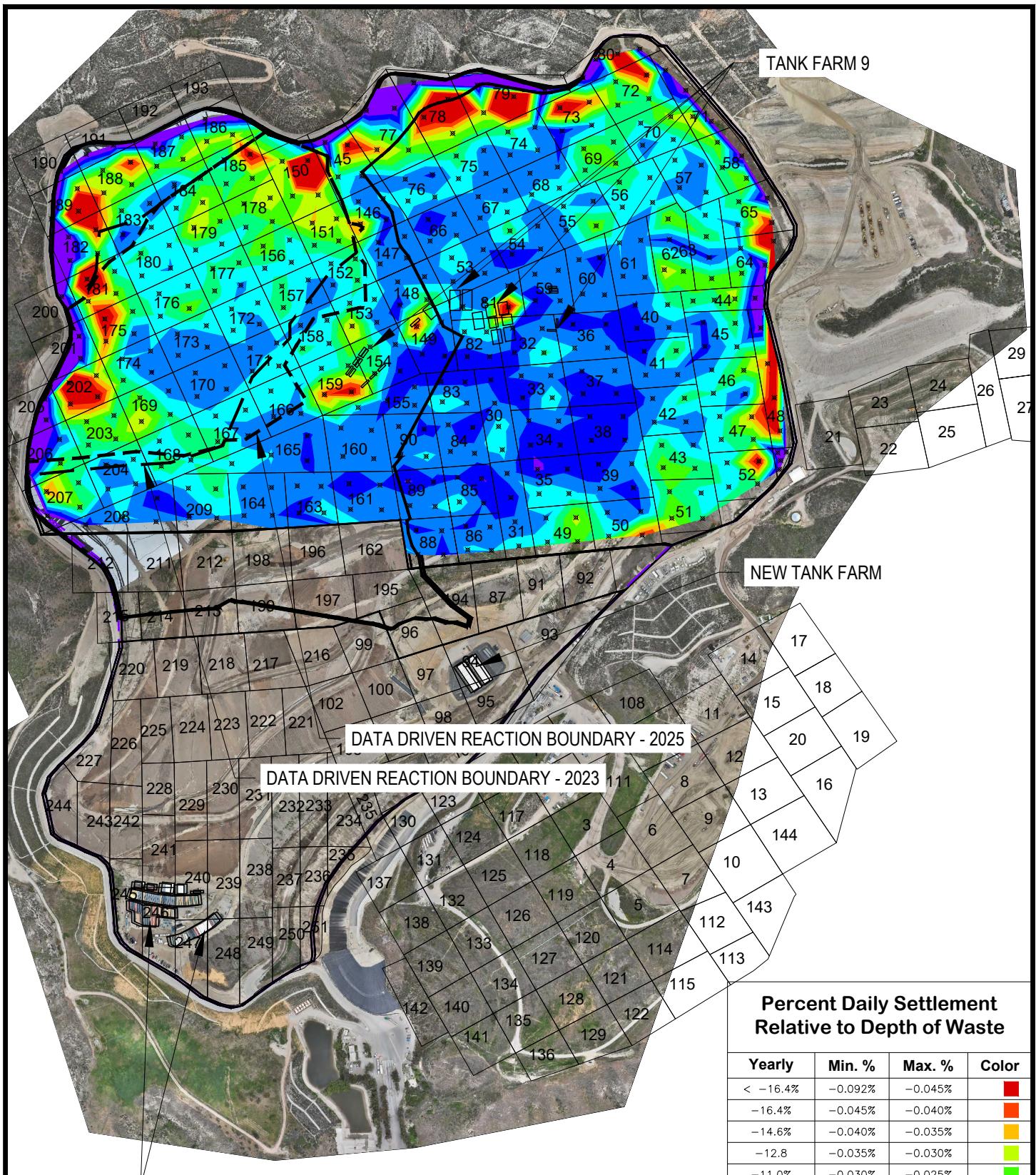








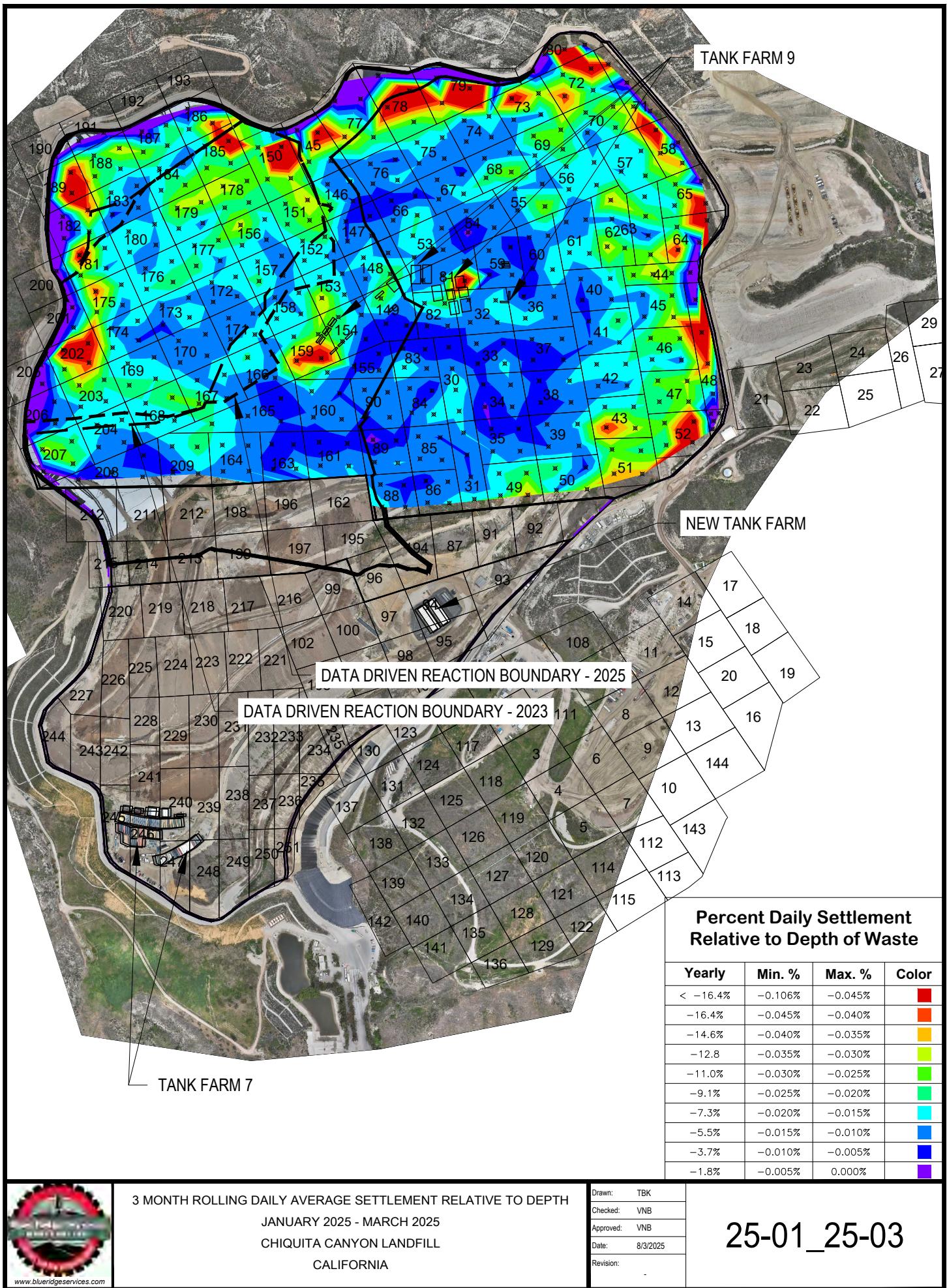


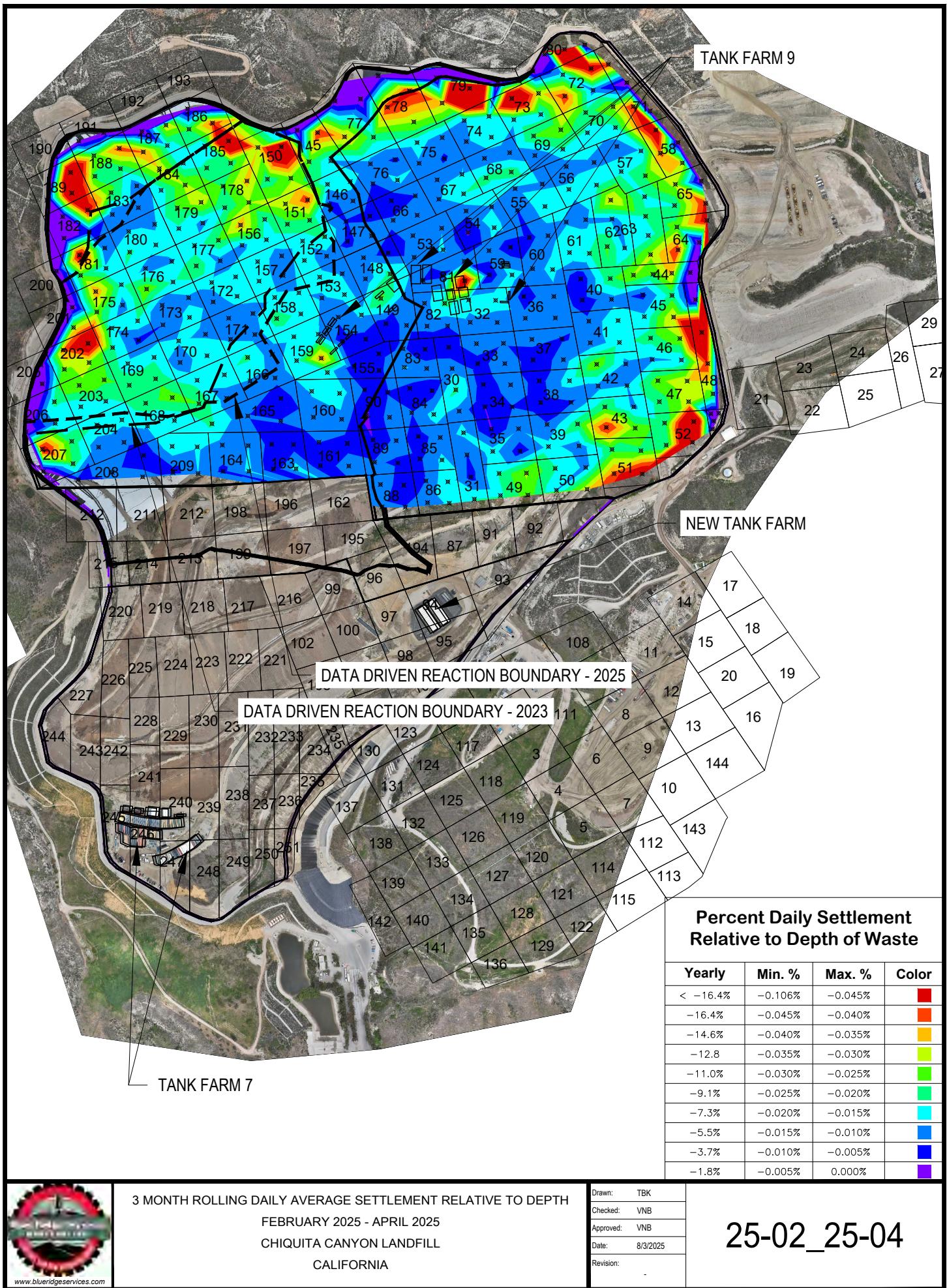


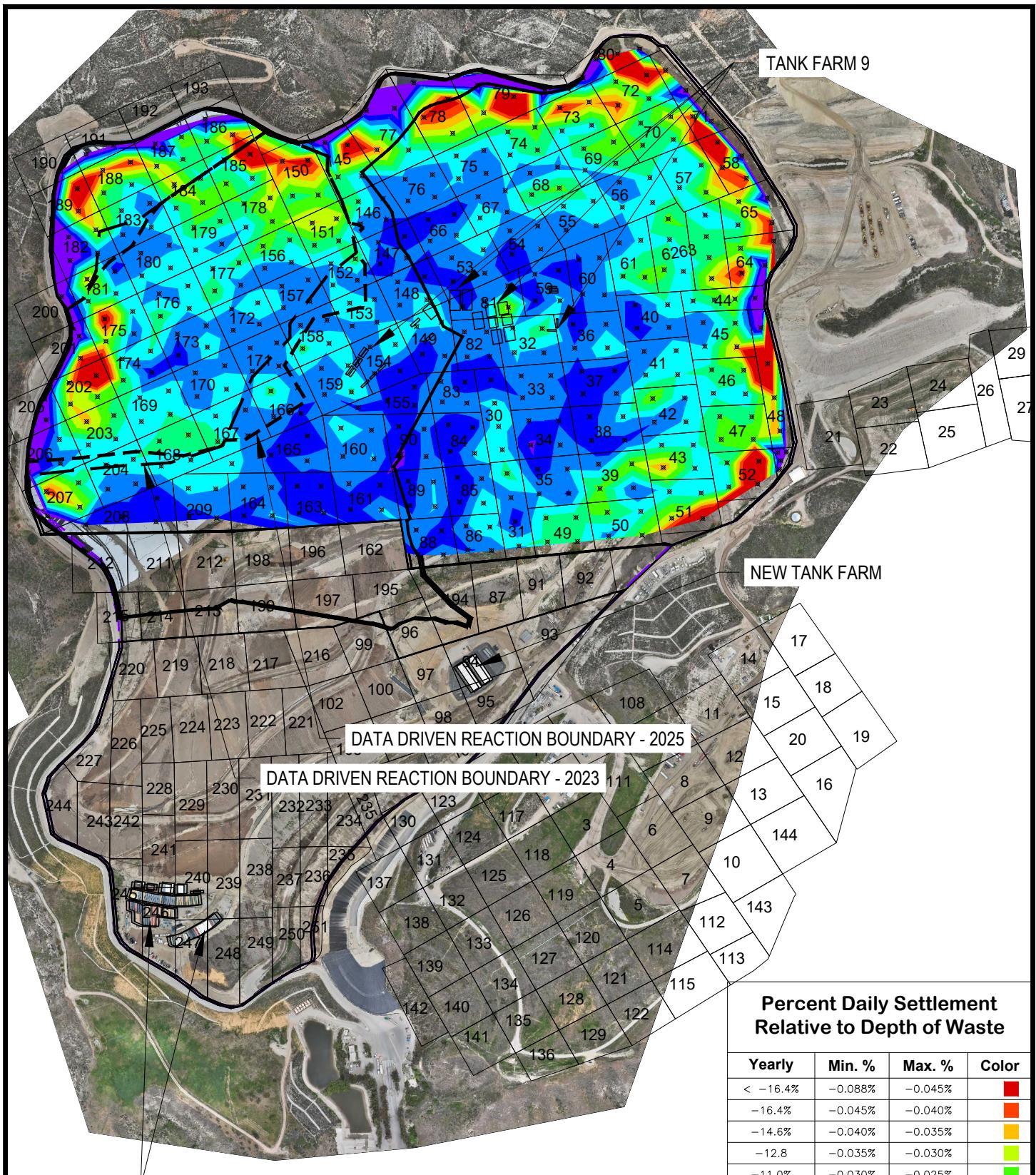
3 MONTH ROLLING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
DECEMBER 2024 - FEBRUARY 2025  
CHIQUITA CANYON LANDFILL  
CALIFORNIA

Drawn:	TBK
Checked:	VNB
Approved:	VNB
Date:	8/3/2025
Revision:	

24-12\_25-02







3 MONTH ROLLING DAILY AVERAGE SETTLEMENT RELATIVE TO DEPTH  
MARCH 2025 - MAY 2025  
CHIQUITA CANYON LANDFILL  
CALIFORNIA

Drawn:	TBK
Checked:	VNB
Approved:	VNB
Date:	8/3/2025
Revision:	

25-03\_25-05