

**BEFORE THE HEARING BOARD OF THE
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

In The Matter Of

SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT,

Petitioner,

vs.

CHIQUITA CANYON, LLC a Delaware
Corporation,
[Facility ID No. 119219]

Respondent.

Case No. 6177-4

**DECLARATION OF NEAL BOLTON,
P.E.**

Health and Safety Code § 41700, and
District Rules 402, 431.1, 3002, 203, 1150

Hearing Date: June 4, 17, and 24, 2025

Hearing Time: 9:30 A.M.

Place: Hearing Board
South Coast Air Quality
Management District,
21865 Copley Drive
Diamond Bar, CA 91765

I, Neal Bolton, declare as follows:

1. I am of sufficient age and am competent to testify in this proceeding. I make this declaration based upon personal knowledge and am competent to testify to the facts set forth herein.

2. This supplemental declaration is made for the status and modification hearing being held on June 4, 17, and 24, 2025 on the Stipulated Order for Abatement in Case No. 6177-4 with the South Coast AQMD, most recently modified on April 16, 2025 (“Modified Stipulated Order”). This declaration supplements the declaration submitted to the South Coast AQMD Hearing Board on May 30, 2025. That declaration outlines my background and credentials and experience working with the Chiquita Canyon Landfill (“Landfill”). That declaration also provides updates regarding Chiquita Canyon, LLC’s (“Chiquita”) compliance with the conditions under the Modified Stipulated Order. Everything stated in my May 30, 2025 declaration remains true and applicable for this upcoming status and modification hearing.

3. This supplemental declaration provides additional information about the geosynthetic cover, including Chiquita’s extension of the cover under the supervision of the Department of Toxic Substances Control (“DTSC”) and the Los Angeles County Department of Public Health, Solid Waste

Management Program, acting as the Local Enforcement Agency (“LEA”).

Current Cover

4. Pursuant to **Condition 31** of the Modified Stipulated Order, previously Condition 25 of the Original Stipulated Order dated September 6, 2023, Chiquita “install[ed] a geosynthetic cover over western portions of Module 2B/3/4 Phase 2, Module 2B/3, and Module 4 to limit the migration of landfill gas from the site.” As required by the condition, the cover is “of at least 30 mil thickness.” Additionally, as required by **Condition 31**, Chiquita submitted the completed design of the cover to South Coast AQMD, which provided “provided greater definition to the cover location, including associated landfill gas extraction infrastructure to be installed underneath the cover.” Chiquita continues to provide monthly updates regarding the procurement and installation of the geosynthetic cover in Section O of its **Condition 8** monthly reports.

5. The full installation of the geosynthetic cover was ordered and supervised by the following agencies:

- The United States Environmental Protection Agency pursuant to the Unilateral Administrative Order issued on February 21, 2024;
- South Coast AQMD, pursuant to the Modified Stipulated Order; and
- The LEA pursuant to the Compliance Order issued on June 6, 2024.

6. Chiquita completed the final installation of over 45.9 acres of geosynthetic cover on January 3, 2025. Chiquita conducts visual inspections of geosynthetic cover Monday through Saturday pursuant to **Condition 30**. Furthermore, as required by **Condition 30**, Chiquita promptly repairs any cover issued identified, which may include repairing or resealing the geosynthetic cover. Chiquita submits logs detailing these inspections and any repairs made, which are included in Section L of the **Condition 8** monthly reports.

Cover Extension

7. Chiquita is in the process of extending the cover based on the DTSC Imminent and Substantial Endangerment Determination and Order (the “DTSC ISE Order”) dated April 1, 2025 and

effective as of April 2, 2025.¹ The DTSC ISE Order, attached hereto as **Exhibit A**, requires Chiquita to install an approved landfill cover on all areas of the Landfill not currently covered by the geosynthetic cover and to which the reaction has the potential to expand. The cover must be at least 40-mil thick, accommodate landfill settlement and subsidence, sufficiently limit the transmission of gases, and provide durability from foot traffic, exposure to ultraviolet radiation, and inclement weather, or motorized equipment. Additionally, the cover must be able to withstand conditions at the Landfill, including, without limitation, elevated temperatures and gas/odor emissions. The DTSC ISE Order also requires that Chiquita conduct the work with appropriate air monitoring, using Construction Quality Assurance techniques, and in a manner that complies with the Modified Stipulated Order.

8. Pursuant to the DTSC ISE Order, Chiquita submitted a Draft Removal Action Workplan (the “Workplan”) to DTSC on May 16, 2025 for its review and approval. A true and correct copy of the Workplan is attached hereto as **Exhibit B**.

9. As stated in the Workplan, Chiquita proposed working in stages and beginning by installing an initial fifteen acres of additional geosynthetic cover. The new geosynthetic cover will be installed in five-acre phases to allow Chiquita to install the necessary landfill gas control infrastructure and minimize disruption to the Landfill’s operations and implementation of mitigation measures. Five acres of geosynthetic cover is large enough to be effective in controlling emissions and small enough to limit the size of impacts to continued gas collection and control system operation. In addition to expanding the cover, Chiquita will also be installing surface collectors beneath the new cover to prevent the accumulation of landfill gas at high focal points. Toe drains will be installed at the toe of slopes to collect liquids in areas where such collection is required.

10. As detailed in the Workplan, Chiquita plans to install geosynthetic cover produced by Viaflex, which is the only manufacturer who produces a geosynthetic cover that satisfies the requirements detailed above in Paragraph 7. Viaflex’s geosynthetic cover is made from HDPE with an inner core of EVOH barrier resin and will be at least 60-mil thick. The new 60-mil geosynthetic cover is

¹ On May 1, 2025, the LEA issued a Compliance Order requiring Chiquita to extend the geosynthetic cover. The requirements regarding the cover expansion are virtually identical to those contained within the DTSC ISE Order.

1 textured on both sides and will be tan. The Workplan incorporates the LEA-approved Revised
2 Geomembrane Cover Monitoring and Maintenance Plan (see Exhibit B, Appendix H).

3 11. DTSC provided written approval of the cover material on June 2, 2025 and Chiquita
4 placed its order for the cover material the same day. The material needed to install the new geosynthetic
5 cover should arrive at the Landfill in late July to early August. Contingent upon DTSC's approval of the
6 Workplan, Chiquita anticipates placing this new 60-mil geosynthetic cover as soon as possible, once it is
7 delivered to the Landfill. To expedite the process, while installing cover in one section, Chiquita will be
8 conducting preparation and subgrading work in another section simultaneously. The preparation work
9 for this project will include preparing the work area by removing any green waste and vegetation,
10 regrading existing benches and slopes as needed, installing vertical and horizontal landfill gas collectors
11 to ensure proper distribution of vacuum to the underside of the newly installed geosynthetic cover, and
12 adding soil to ensure for proper drainage. To prepare for the installation of the cover, Chiquita has
13 already begun drilling wells in the first five-acre segment. Each five-acre area will contain between four
14 to seven new wells.

15 12. Once the preparation work in a deployment area is complete, Chiquita will install the 60-
16 mil geosynthetic cover which will require deploying the actual liner, installing pipe boots around the
17 vertical collectors, welding the 60-mil geosynthetic cover to the 30-mil geosynthetic cover to ensure that
18 there is continuous seaming between the two, placing geotextile and gravel across access roads (as
19 needed), placing sandbag ballast as needed to prevent the 60-mil geosynthetic cover from being lifted by
20 the wind, and the reinstalling any landfill gas headers and laterals that were temporarily disconnected to
21 complete the work.

22 13. Provided Chiquita receives a timely approval of its Workplan from DTSC, Chiquita
23 anticipates completing the installation of the initial fifteen acres of cover by November 7, 2025.
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1 I declare under penalty of perjury under the laws of the State of California that the foregoing is true and
2 correct to my personal knowledge.

3 Executed on this 20th day of June 2025, in Victor, Montana.

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5 _____
6 Neal Bolton
7 President
8 Blue Ridge Services, Inc.
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CHIQUITA CANYON, LLC [FACILITY ID No. 119219] – EXHIBIT A TO SUPPLEMENTAL DECLARATION OF NEAL BOLTON, P.E.

**STATE OF CALIFORNIA
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL**

In the Matter of:	)	Docket No. HSA-FY24/25-082
)	
Chiquita Canyon Landfill)	
29201 Henry Mayo Drive	)	IMMINENT AND SUBSTANTIAL
Castaic, California 91384	)	ENDANGERMENT
	)	DETERMINATION AND ORDER
Respondents:)	
)	
Chiquita Canyon, LLC)	
29201 Henry Mayo Drive	)	Health and Safety Code
Castaic, California 91384	)	Sections 58009, 58010,
	)	78870, and 79055(a)(1)(B)
Chiquita Canyon, Inc.)	
3 Waterway Square Place, Suite 110)	
The Woodlands, Texas 77380)	
)	
Waste Connections US, Inc.)	
3 Waterway Square Place, Suite 110)	
The Woodlands, Texas 77380)	

I. INTRODUCTION

1.1 **Parties.** The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) issues this Imminent and Substantial Endangerment Determination and Order (Order) to Chiquita Canyon, LLC, Chiquita Canyon, Inc., and Waste Connections US, Inc. (Respondents).

1.2 **Property/Site.** This Order applies to the property located at 29201 Henry Mayo Drive, Castaic, California 91384. The property is approximately 639 acres and is identified as Assessor's Parcel number(s) 3271002039, 3271002036, 3271005034, 3271002019, 3271002013, and 3271002011. This Order applies to the property and the areal extent of contamination that resulted from activities on the property (hereinafter, the "Site").

1.3 **Permitting Status.** Respondents own and/or operate a class III landfill/solid waste disposal facility known as Chiquita Canyon Landfill (CCL), which is operating under a permit (Solid Waste Facilities Permit No. 19-AA-0052), issued by the Los Angeles County Department of Public Health Solid Waste Management Program, acting as the Local Enforcement Agency (LEA). CCL has publicly stated that it is no longer accepting any waste as of January 1, 2025. CCL previously accepted non-hazardous solid waste, including municipal solid waste from

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various areas within Los Angeles County in accordance with California Code of Regulations, title 27 (27 CCR), section 20005 et seq. The Respondents engage in the management of landfill/solid waste disposal pursuant to a Conditional Use Permit (CUP 2004-00042-(5)) issued by the County of Los Angeles.

1.4 Jurisdiction. This Order is issued by DTSC to Respondents pursuant to its authority under Health and Safety Code sections 58009, 58010, 78870, and 79055(a)(1)(B).

Health and Safety Code section 78870 authorizes DTSC to take various actions, including issuance of an Imminent or Substantial Endangerment Determination and Order, when DTSC determines that there may be an imminent or substantial endangerment to the public health or welfare or to the environment, because of a release or a threatened release of a hazardous substance.

Health and Safety Code section 79055(a)(1)(B) authorizes DTSC to issue an order establishing a schedule for removing or remedying a release of a hazardous substance at a site, or for correcting the conditions that threaten the release of a hazardous substance. The order may include, but is not limited to, requiring specific dates by which the nature and extent of a release shall be determined and the site adequately characterized, appropriate plans prepared and submitted to DTSC for approval, and a removal or remedial action completed.

Health and Safety Code section 58009 authorizes DTSC to commence and maintain all proper and necessary actions and proceedings to enforce its rules and regulations; to enjoin and abate nuisances related to matters within its jurisdiction which are dangerous to health; to compel the performance of any act specifically enjoined upon any person, officer, or board, by any law of this state relating to matters within its jurisdiction; and/or on matters within its jurisdiction, to protect and preserve the public health.

Health and Safety Code section 58010 authorizes DTSC to abate public nuisances related to matters within its jurisdiction.

II. FINDINGS OF FACT

DTSC hereby finds:

2.1 Liability of Respondents. Respondents are responsible parties or liable persons as defined in Health and Safety Code section 78145.

2.1.1 Chiquita Canyon, LLC – Chiquita Canyon, LLC is the owner of CCL. In addition, Chiquita Canyon, LLC operates CCL subject to the control of Waste Connections US, Inc., including, without limitation, by maintaining an office at CCL, registering the fictitious business name “Chiquita Canyon Landfill,” and obtaining a conditional use permit from Los Angeles County to operate CCL. Chiquita Canyon, Inc. is the sole member of Chiquita Canyon, LLC, and Ronald J. Mittelstaedt is identified as a manager.

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2.1.2 Chiquita Canyon, Inc. – Chiquita Canyon, Inc. wholly owns Chiquita Canyon, LLC. Ronald J. Mittelstaedt is the Chief Executive Officer of Chiquita Canyon, Inc. Chiquita Canyon, Inc. and Chiquita Canyon, LLC share a principal address, at 3 Waterway Square Place, Suite 110, The Woodlands, TX 77380. Chiquita Canyon, Inc. operates CCL subject to the control of Waste Connections US, Inc.

2.1.3 Waste Connections US, Inc. – Waste Connections US, Inc. is a parent corporation of Chiquita Canyon, LLC and Chiquita Canyon, Inc. Ronald J. Mittelstaedt is the President and Chief Executive Officer of Waste Connections US, Inc., and has served in this role since Waste Connections US, Inc. was founded in 1997, with the exception of the period between July 2019 and April 2023, when he served as Executive Chairman. Waste Connections US, Inc. exercises significant control over CCL, Chiquita Canyon, LLC, and Chiquita Canyon, Inc., including, without limitation, by managing, directing, and conducting operations related to disposal or leakage of hazardous waste at CCL. Waste Connections US, Inc.’s employees also make decisions about CCL’s compliance with environmental regulations and represent CCL before regulatory agencies, governmental entities, and the media. As of December 10, 2024, the “About Chiquita Canyon” page of the CCL website stated that CCL “is owned and operated by Waste Connections.” At some point after December 10, 2024, that statement about Waste Connections US, Inc.’s ownership and operation of CCL was removed from the CCL website. (See Exhibit 1.)

2.2 Physical Description of Site. CCL is located at 29201 Henry Mayo Drive, Castaic, California 91384 in the County of Los Angeles. The Site lies within the United States Geological Survey (USGS) Val Verde, 7½-Minute Quadrangle. The coordinates of the Site are North 34 42.619 and West 118 64.680. CCL is approximately 639 acres in size and is in an area zoned A-2-2 heavy agricultural. The property is currently occupied and operating as a lined, class III non-hazardous municipal solid waste landfill. The surrounding area consists of industrial, agricultural, and residential properties. The nearest residential development is the Val Verde community, located approximately 1,000 feet northwest of CCL. (See Exhibit 2.)

CCL is comprised of landfill modules (2B/3/4, 4, and 5), cells (2 PH 2A, 2 PH 2B, 1/2A, 6, 8A and 8B), and canyons (Primary Canyon, Canyon A, Canyon B, Canyon C Cell 1, Canyon C Cell 2 PH1, and Canyon D). (See Exhibit 3.) The Primary Canyon (approx. 55 acres) operated from 1970 to 1987, and Canyon B (approx. 15 acres) operated from 1987 to 1988. The “Main Canyon” is comprised of Canyons A, C, and D, and Cells 1 through 6, and 8. Leachate is piped from extraction wells to remove perched liquid from the waste mass, as well as from condensate sumps and leachate sumps. Leachate is accumulated in seven distinct areas across CCL, which include: #2 East Perimeter; #3 Ameresco Condensate Tanks; #4 Leachate Collection Manifold; #6 North Perimeter; #7 Tank Farm; #8 Primary Canyon; and #9 Tank Farm (also referred to as “Tank Farm 9”).

Tank Farm 9 is of particular concern because it is located on CCL’s “top deck,” which herein refers to the surface area directly above the Subsurface Elevated Temperature (SET) event, which presently includes, at a minimum, all or part of Module 2B/3/4, Module 4, Cell 1/2A, Cell 2 PH 2B, Canyon C Cell 2 PH1, and Canyon C Cell 1.¹ (See Exhibit 3.) Tank Farm 9

¹ In landfill industry parlance, “top deck” typically refers to the uppermost element of a landfill, such as a cap barrier

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is vulnerable to the effects (i.e., subsidence, cracks or separations in the “top deck,” elevated temperatures, and settlement (total and differential)) of a known uncontrolled SET event (see Section 2.3 below). CCL currently has no physical breaks/barriers preventing the expansion of the SET event across the “top deck” and the east slope, consequently the entire landfill including Cell 8A may be impacted by the SET event. Because Cell 8A: (1) is being used for disposal of on-site materials, (2) can be used as a location for a soil berm to increase south slope stability, and (3) is adjacent to the main ingress and egress road, allowing the SET event to enter this cell could have irreversible negative results. Cell 8A is the southernmost slope of the landfill, located in the southern portion of the Main Canyon near the main entrance that allows access to areas throughout CCL. As a result, stability of Cell 8A is of particular concern because the SET event will increase leachate and gas pressure that can affect slope stability should it enter this cell.

2.3 Site History and Current Status. CCL was first approved for waste disposal in 1967. It has been in use as a class III non-hazardous solid waste landfill since 1972, and has been permitted to accept non-hazardous solid waste for disposal, including municipal solid waste, green waste for composting or recycling, construction and demolition debris, and e-waste for recycling. CCL has been prohibited from accepting hazardous waste, including that which is ignitable, corrosive, reactive, or toxic. CCL was also prohibited from accepting biohazardous waste, household hazardous waste, radioactive materials, incinerator ash, sludge, automobile shredder waste, and liquid waste. On January 1, 2025, CCL ceased further acceptance of waste material. CCL must continue landfill gas and leachate collection and comply with other Los Angeles County Department of Public Health permit requirements following the landfill’s closure.

On or about May 2022, an uncontrolled SET event significantly expanded in the inactive north-western portion of CCL in an area about 30 acres in size, in portions of the landfill identified as Cell 1/2A, Module 2B/3, Module 4, and Module 2B/3/4 P2. (See Exhibit 4.) SET events are caused by subsurface oxidation and waste reactions. The most common contributor to SET events is when ambient air is pulled into the landfill mass by the gas extraction system, which creates an environment where oxidation can occur. As temperatures increase in the presence of oxygen, spontaneous combustion and a smolder can occur, causing increased odors and emissions.

SET events threaten public health, safety, and the environment. A SET event begins to occur when temperatures in subsurface landfill waste exceed 145 degrees Fahrenheit (F). As a SET event progresses above 160 degrees F, methane generation is severely curtailed, and landfill environmental control devices manufactured with plastic, including landfill cover, liner system, and gas/leachate collection systems, can be damaged. Above 160 degrees F, underground exothermic reactions are more likely to occur. When an exothermic reaction occurs, the landfill will generate heat, leachate and gas pressures, and gas containing noxious odors; increase emissions of volatile organic compounds and toxic air contaminants such as benzene and methyl ethyl ketone (MEK); and produce large amounts of leachate with hazardous characteristics. The landfill itself may become unstable, threatening potential failures which could expose smoldering solid waste and leachate with hazardous characteristics to the environment and further impact

installed after active landfilling has ended, or as waste reaches the landfill’s final grades in the cells. At CCL, the term has also been used to refer to the location on top of the SET event in the northwest area of CCL.

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landfill infrastructure (i.e., existing cover, slopes, liner(s), leachate and gas collection systems, etc.).

SET events can be detected through a combination of physical factors. Landfill gas well temperatures, gas composition changes, e.g. increases in carbon dioxide, volatile organic carbons, hydrogen, and carbon monoxide, and decreases in methane. Landfill gas temperatures increase in the waste mass and subsequently at the gas extraction well-heads. Gas pressure increases and noxious odors are generated. Leachate volume increases and quality decreases such that leachate exhibits hazardous characteristics. As the SET event progresses, rapid surface settlement occurs and slope instability may result.

Following the significant expansion of the SET event in 2022, the waste mass produced large amounts of leachate with hazardous levels of benzene and MEK. In discussions with CCL staff during a site visit on November 2, 2023, California Department of Resources Recycling and Recovery (CalRecycle, formerly the California Integrated Waste Management Board) staff learned that the boring of three gas control wells (CV-1534A, CV-1532B, and CV2338) caused leachate to be released under pressure. CCL's boring logs indicate that these wells were installed on September 26, 2023; October 12, 2023; and October 4, 2023, respectively, and describe the releases from these boreholes as "geysers." During the same November 2023 visit, DTSC and CalRecycle staff directly observed a leachate outbreak in the northern area of CCL. Additionally, slopes in the CCL were observed to be leaking so much leachate that a French drain collection system had to be installed to control the free release. The elevated temperature and continued outflow of leachate has resulted in the area around well CV-2201 settling about 25 to 30 feet between 2022 and November 2023. The SET event has also increased temperature, pressure, and gas production at CCL, and is resulting in releases of gas containing volatile organic compounds and noxious odors that constitute a nuisance to the surrounding community.

To attempt to mitigate the reaction and odors, leachate must continuously be pumped out of the landfill. Once extracted, leachate is collected in tanks in distinct geographic locations across the landfill, including Tank Farm 9, which operates in the northeast portion of the "top deck" of CCL. Due to the volume of leachate being produced at the Site and the leachate's hazardous characteristic, hazardous waste leachate is currently being treated on-site by utilizing 24 granular activated carbon vessels which each hold 4,000 pounds of carbon media. The leachate, after treatment to non-hazardous levels, is transported to non-hazardous disposal facilities. Reports from CCL reflect that approximately 62.8 million gallons of leachate was collected in 2024, which translated to around 193 acres-feet of liquid, one foot deep. In the last five months of 2024, approximately six million gallons of leachate were extracted from CCL. Over the past year, the amount of leachate produced by the landfill has more than doubled, with about 3 million gallons produced in February 2024, and about 8 million gallons produced in February 2025.

Information provided by CCL in January and February 2025 indicates that the SET event is expanding to the east and south of the existing geomembrane cover and has reached Tank Farm 9. Underground temperatures recorded at CCL between January 9, 2025 and February 19, 2025 demonstrate the SET event has expanded beyond the original 30 acres in the northwestern portion of the landfill in Cell 1/2A, Module 2B/3, Module 4, and Module 2B/3/4 P2. These

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recent reports illustrate waste temperatures of 183 degrees F and 185 degrees F at the eastern side of the top-deck of the CCL near Tank Farm 9 at Temperature Monitoring Probes (TMPs) TP-15, TP-31, and TP-29. Other wells to the east and southeast of the geomembrane cover exhibit temperatures above 170 degrees F, such as TP-08 and TP-26. Wells TP-04, TP-11, TP-14, TP-30, and TP-32, which have measured temperatures at or above 165 degrees F. Based on these data, the SET event now encompasses approximately 90 acres of CCL. (See Exhibit 5.)

Recent data from CCL also confirms that settlement is occurring around the leachate Tank Farm 9, which threatens the continued operation and integrity of the tanks and piping and threatens a release of hazardous waste. Specifically, a February 17, 2025 weekly report identified new fissures and tension cracks, which are an indication of landfill settlement and/or slope instability, in areas where elevated temperatures were or are measured. Area #148, which is just north of Tank Farm 9, experienced an opening of significant fissures and tensions cracks that have been remediated but are likely to reappear as additional buried waste undergoes thermal breakdown and settles. Area #154, which is located just south of the tank farm, also recently experienced fissuring and tension crack development. Even more concerning is Area #147, which experienced a sinkhole, indicating a significant thermal breakdown of buried waste that resulted in a void developing below the interim soil cover. Area #147 is the next grid area north of Area #148. (See Exhibit 6, Memorandum from Dr. Timothy Stark to Mr. Matthew Dwyer, *RE: Comments on November 26, 2024 Revised Soil Reaction Break/Barrier Plan and February 20, 2025 waste temperature data for Chiquita Canyon Landfill Subsurface Elevated Temperature (SET) Event* (Feb. 26, 2025) (the “Stark Memo”), at Figures 3, 4, and 5; see also Exhibit 7, CCL grid system in the north east portion of the landfill.)

Continued settlement at Tank Farm 9 could physically separate the tanks, disconnect piping that conveys leachate to and between tanks and treatment systems, and result in a release of hazardous waste to the landfill. If Tank Farm 9 is damaged, there may be insufficient tankage to manage leachate produced by the landfill, resulting in leachate buildup that could impact the stability of the landfill, potentially leading to slope failure and the release of hazardous substances. Extreme heat from SET events can damage the landfill geosynthetic bottom liner system that underlies the deposited waste, threatening the release of hazardous leachate from the landfill, which could in turn contaminate soil and groundwater.

Without additional action, the SET event may consume the entire waste fill in the Main Canyon, which could threaten stability of the southern toe of the waste fill in Cell 8A. A slope failure in the southern slope would expose the reacting and smoldering waste, hazardous waste leachate, and potentially block off the primary entrance and exit of the facility.

2.3.1 Regulatory Actions. Various regulatory agencies, including DTSC, are actively involved with overseeing CCL as part of a Multi-Agency Critical Action Team (MCAT). The MCAT also includes agencies such as the United States Environmental Protection Agency (USEPA); California Environmental Protection Agency (CalEPA); South Coast Air Quality Management District (South Coast AQMD); CalRecycle; Los Angeles Regional Water Quality Control Board (Los Angeles RWQCB); California Air Resources Board (CARB); California Office of Environmental Health Hazard Assessment (OEHHA); Los Angeles County Departments of Public Health, Regional Planning, and Public Works; and the Los Angeles

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Certified Unified Program Agency. MCAT agencies have taken various regulatory actions in response to the SET event.

On September 6, 2023, South Coast AQMD issued an Order for Abatement that required certain Respondents to take actions to reduce odors from the landfill that have impacted the community. Pursuant to the Order for Abatement, Respondents submit reports summarizing landfill leachate leak, spill, and seep information. Additionally, pursuant to the Los Angeles RWQCB's Monitoring and Reporting Program (No. CI-6231), Respondents are required to report leachate seeps. The reports submitted to South Coast AQMD and the Los Angeles RWQCB are published on CCL's website (<https://chiquitacanyon.com/odor-mitigation/>).

On November 2, 2023; December 12–13, 2023; and February 20 and 27, 2024, DTSC participated in multi-agency site visits at CCL. During the December 12, 2023 site visit, DTSC collected samples of landfill leachate and determined the samples exceeded Resource Conservation and Recovery Act (RCRA) and California hazardous waste regulatory levels for benzene. Subsequent sampling by CCL has also shown regulatory hazardous waste threshold exceedances in leachate and/or condensate at CCL.

On February 15, and March 29, 2024, DTSC issued two Summaries of Violations (SOVs) to certain Respondents identifying alleged violations of the California Hazardous Waste Control Act (Health & Safety Code, § 25100 et seq.). Per the SOV dated February 15, 2024, DTSC alleges that Respondents failed to minimize the possibility of a release of hazardous waste or hazardous waste constituents, which included a compliance requirement to report all releases of hazardous waste to DTSC. (See Exhibit 8.)

On February 21, 2024, the USEPA issued a Unilateral Administrative Order (UAO) to certain Respondents, which required Respondents to perform certain response actions to address off-site impacts and ongoing subsurface reactions causing off-site impacts. The UAO provides further detail on Respondents' operation of the landfill, the SET event, and recent federal, state, and local regulatory actions to address issues related to noxious odors, leachate, and leachate condensate. The UAO requires Respondents to provide and implement a Master Work Plan that includes a Leachate Management Plan, Soil Reaction Break/Barrier Plan, Cover Installation Plan, Slope Stability Analysis, Air Monitoring Plan, and Off-Site Migration Prevention Plan. USEPA's oversight of the Respondents' work plans and required response actions is ongoing. (See Exhibit 9.)

On June 6, 2024, the Los Angeles County Department of Public Health Solid Waste Management Program, acting as the LEA, issued a Compliance Order to certain Respondents to correct violations related to state minimum standards for gas monitoring and control and site maintenance. (See Exhibit 10.) The LEA's Compliance Order required Respondents to implement mitigation measures to correct the violations, such as constructing a soil reaction break/barrier at a predesignated area(s), installing temperature monitoring devices, developing a cover repair and maintenance plan, performing a slope stability analysis, and collecting temperatures in and around the reaction area to ensure the French drain system meets manufacturer temperature design specifications/recommendations.

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In January 2025, CCL completed installation of a 30 mil thick white HDPE geomembrane cover over Cell 1/2A, Module 2B/3, Module 4, and Module 2B/3/4 P2 in order to address the SET event, consistent with the USEPA and LEA orders. CCL has not yet installed a vertical soil break/barrier to contain the reaction as required under the USEPA and LEA orders.

This Order is therefore intended to supplement the USEPA's UAO, the LEA's Compliance Order, and other MCAT regulatory actions by requiring Respondents to perform additional removal actions to protect public health or welfare or the environment, because of a release or a threatened release of a hazardous substance.

2.4 Hazardous Substances Found at the Site. On December 12, 2023, DTSC's Office of Criminal Investigations completed a site investigation at the Site and collected leachate samples from three well heads and one sump located in the reaction area. The results showed the following concentrations of benzene at the three well heads:

- Well CV-2306, Sample CCL-4B with 0.590 milligrams per Liter (mg/L);
- Well CV-2203, Sample CCL-6B with 0.912 mg/L; and
- Well CV-2338, Sample CCL-8B with 0.196 mg/L.

Respondents also analyzed leachate samples from these same three wells. The results showed the following concentrations of benzene at the three well heads:

- Well CV-2306, Sample CCL-4A/5A with 1.2 mg/L;
- Well CV-2203, Sample CCL-6A/7A with 2.9 mg/L; and
- Well CV-2338 CCL-8A/9A with 0.59 mg/L.

The level of benzene in each of the leachate samples exceeds the federal and California hazardous waste threshold value of 0.5mg/L for benzene, except for Sample CCL-8B.

Respondents have also sampled leachate and condensate onsite in late 2023 and throughout 2024. Leachate and/or condensate samples collected reflected exceedances of federal and California hazardous waste thresholds for benzene and MEK.

MEK has been detected exceeding the federal regulatory threshold of 200 milligram per Liter (mg/L) in samples of leachate. CCL provided sample data of leachate collected in March 2024, which showed the following concentrations of MEK at the #2 East Perimeter tank area:

- Tank 48, Sample CACA0306Z005EP48 with 250 mg/L;
- Tank 52, Sample CACA0306Z005EP52 with 230 mg/L; and
- Tank 72, Sample CACA0309Z005EP72 with 200 mg/L.

2.5 Health Effects. DTSC has determined that a potential for a complete exposure pathway exists at the Site. The hazardous substances described in Paragraph 2.4 could cause serious adverse health effects if people are exposed to them. The potential health effects are described as follows:

2.5.1 Benzene. Benzene is a clear, flammable liquid that is a known human carcinogen which can affect hematological, immunological, gastrointestinal, respiratory, hepatic, neurological, and reproductive systems; and can produce myeloid leukemia, Hodgkin's disease, and lymphomas, as well as non-cancer adverse health effects. Benzene can volatilize into vapors in the air and can easily leach from soil into groundwater. Benzene breaks down more slowly in water and soil than it does in the air. Humans can be exposed to benzene from contaminated air, surface water, groundwater, drinking water, and soil.

2.5.2 Methyl Ethyl Ketone. MEK is a chemical that can cause irritation to the eyes, nose, and throat when inhaled in acute (short-term) exposure in humans. Chronic (long-term) effects of MEK in humans are not well known, but chronic inhalation studies in animals have reported slight neurological, liver, kidney, and respiratory effects. At high concentrations, MEK can cause reversible central nervous system depression in animals. MEK is classified as a flammable liquid and can cause serious eye damage/eye irritation, respiratory tract irritation, and narcotic effects.

2.6 Routes of Exposure. In addition to possible exposure via inhalation of volatile organic compounds such as benzene, individuals working on Site or residing in the vicinity of the Site may be exposed to hazardous substances through dermal contact with soil, waste, or water contaminated by hazardous leachate during recreational or occupational activities. Should hazardous leachate migrate to groundwater, the public could be exposed through ingestion of contaminated drinking water.

2.7 Public Health and/or Environmental Risk. Pursuant to the SET event and its ongoing expansion, the Site presents a serious threat to public health and to the environment due to the potential for the hazardous leachate present at the Site, and generated by the SET event, to be released in several ways.

First, leachate could be released into local groundwater supplies due to the uncontrolled nature of the SET event, and its potential impacts on landfill liners. Groundwater is present in the area of the Site in two distinct aquifers. The upper alluvial aquifer is generally bounded by the Santa Clara River flood plain, about 20 to 50 feet deep. It is underlain by the Saugus aquifer. The Los Angeles RWQCB currently monitors a network of groundwater monitoring wells to identify any potential impacts to groundwater by the SET event. The elevated temperatures and chemicals produced by the reaction may threaten the integrity of the landfill liner, which, if compromised, creates a risk of release of benzene and other hazardous substances from the leachate into these aquifers, contaminating groundwater.

Second, CCL continues to produce large volumes of leachate, much of which is stored in tanks within several tank farms at the Site, which could be compromised by deteriorating conditions caused by the SET event. In particular, the area surrounding Tank Farm 9, which includes tanks which contain hazardous leachate, is showing signs of settlement (total and differential) as a result of the expanding SET event. If the tanks are not moved before conditions in this area deteriorate further, the tanks could become unstable and release hazardous leachate into the environment which could expose individuals working onsite and migrate to soils adjacent to the landfill and threaten surface and groundwater.

Third, leachate seeps, and leachate spills, including those from Tank Farm 9, occurring during the storage and treatment process, resulting from inadequate collection and onsite storage, or from the transport of leachate for offsite disposal, could migrate into stormwater channels and basins and threaten both the Santa Clara River, and groundwater aquifers. As documented in the USEPA UAO determination, these seeps and spills may discharge via stormwater run-off into surface waters downstream and impair aquatic life and wildlife uses of the Santa Clara River.

Fourth, the increased leachate production of the landfill is impacting overall stability of landfill slopes. Should a landfill slope suffer a failure, smoldering trash could be exposed to the environment, exposing surrounding workers and residents to benzene, MEK, and other toxic air contaminants, as well as noxious odors. A landfill slope failure could also release hazardous leachate, exposing workers and potentially residents to hazardous substances such as benzene and MEK.

Lastly, the present lack of natural or installed barriers to prevent the SET event from spreading into Cell 8A creates the potential for the entrance to the facility to become blocked, or too dangerous for entry, such that emergency equipment and workers could no longer enter the facility, thereby jeopardizing emergency or other response actions. The spread of the SET event into Cell 8A could also destabilize the southern toe of the waste fill in Cell 8A due to increased gas pressure and leachate volume, causing or threatening to cause slope failure. The slope failure could cause subsequent uncontrolled release of waste and hazardous leachate. Cell 8A needs to be protected given this location's unique suitability to be used to construct slope stabilization measures, such as an earthen embankment for slope stability and other possible response actions.

III. CONCLUSIONS OF LAW

3.1 Respondents are responsible parties as defined by Health and Safety Code section 78145.

3.2 Each of the substances listed in Section 2.4 is a "hazardous substance" as defined in Health and Safety Code section 78075(a).

3.3 There has been a "release" and there is a "threatened release" of hazardous substances listed in Section 2.4 at the Site, as defined in Health and Safety Code section 78105(a).

3.4 The actual and threatened release of hazardous substances at the Site may present an imminent and substantial endangerment to the public health or welfare or to the environment.

3.5 Response action is necessary to abate a public nuisance and/or to protect the public health and safety and the environment.

IV. DETERMINATION

4.1 Based on the foregoing findings of fact and conclusions of law, DTSC hereby determines that response action is necessary at the Site because there has been a release and/or there is a threatened release of a hazardous substance.

4.2 Based on the foregoing findings of fact and conclusions of law, DTSC hereby determines that there may be an imminent and/or substantial endangerment to the public health or welfare or to the environment because of the release and/or the threatened release of the hazardous substances at the Site.

V. ORDER

Based on the foregoing FINDINGS, CONCLUSIONS, AND DETERMINATION, IT IS HEREBY ORDERED THAT Respondents conduct the following response actions in the manner specified herein, and in accordance with the schedule specified by DTSC, as follows:

5.1 All response actions taken pursuant to this Order shall be consistent with the requirements of Health and Safety Code division 45 (commencing with section 78000 et seq.), and any other applicable state or federal statutes and regulations.

5.1.1 Site Response Strategy. The purpose of this Order is to require for the Site preparation of Removal Action Workplans and implementation of the removal actions described in the Workplans and approved by DTSC.

If necessary for the protection of public health and the environment, DTSC shall require additional removal actions not specified in this Order to be performed. Removal actions shall be implemented in accordance with a workplan and implementation schedule submitted by Respondents and approved by DTSC.

5.1.2. Removal Actions. Respondents shall undertake removal actions because DTSC has determined that they are necessary to mitigate the release or threatened release of hazardous substances at or emanating from the SET event at the Site. In addition to the other requirements of this Order, Respondents shall implement the following removal actions:

- a) Extension of Covered Area. Respondents shall install a DTSC-approved landfill cover on all areas of the Site which are not presently covered by a geomembrane and to which the reaction area has expanded or has the potential to expand. Extending the area covered by a geomembrane is necessary to adequately control infiltration of oxygen and water into the landfill waste, and to control production of gas emissions, odors, and leachate. The geomembrane cover shall accommodate landfill settlement/subsidence, sufficiently limit the transmission of gases (e.g. methane permeance less than 2.5×10^{-13} m/s using ASTM D1434), and provide durability from foot traffic, exposure to ultraviolet radiation, and inclement weather, or motorized equipment, if any. In addition, the cover shall have material properties to address site-specific conditions, including but not limited to, elevated landfill temperatures,

settlement, and harmful landfill gas/odor emissions. This work shall be conducted with appropriate air monitoring, use Construction Quality Assurance techniques, and be consistent with South Coast AQMD's order and other applicable requirements. The geomembrane thickness shall be adequate to withstand the activities and conditions at the facility, but no less thick than 40 mil, with material consistent to prevent heat degradation and control odors and emissions as documented in the Stark Memo, Exhibit 6.

- b) Interim Relocation and Stabilization of Containerized Waste. Incident to installation of a DTSC-approved landfill cover in the current non-capped areas of the Site, and to address threatened releases caused by destabilization of leachate storage tanks resulting from elevated temperatures within the buried waste material surrounding Tank Farm 9, and/or in response to signs of settlement and differential movement in the area, Respondents shall relocate the leachate storage tanks within Tank Farm 9 from the "top deck" to a stable location within CCL to ensure stability, continued effective performance, and to minimize/eliminate threats from the expanding reaction area and landfill settlement to the tank farm. Consistent with (a) above, the integrity of the covered area is paramount, and the tanks, or any other structures, may not be placed upon the covered area upon completion of said cover or any area that may be subject to the SET event in the future.
- c) Protect Cell 8A from Intrusion of Subsurface Elevated Temperature Event. Cell 8A is considered critical infrastructure due to its proximity to the primary point of ingress to and egress from the facility, its favorable location for potential disposal of onsite generated waste, and its unique suitability for slope stabilization activities should that become necessary. Therefore, limiting intrusion of the SET event into Cell 8A is crucial, and Respondents shall implement measures to prevent the SET event from entering Cell 8A. The measures shall include, but are not limited to, the installation of a vertical barrier of inert material not subject to biological, thermal, or oxidative degradation. Respondents may link such a barrier to any existing barrier systems already in this area, provided that the barrier design meets DTSC's requirements and receives DTSC's approval.

5.1.3 Site Response Strategy Meeting. Respondents, including the Project Coordinator (Section 6.1) and Project Engineer/Geologist (Section 6.2), shall meet with DTSC within seven (7) days from the effective date of this Order to discuss response strategy. These discussions shall include Site risks and priorities; project planning, phasing and scheduling, removal action objectives, remedial technologies, data quality objectives, and the workplan.

5.2. Public Notice. Respondents shall work cooperatively with DTSC's Office of Environmental Equity in providing public notice of all response actions at the Site.

5.3 Removal Action Workplan(s) (RAW). DTSC has determined that RAWs are appropriate to address the identified removal actions on the Site. Respondents shall prepare and submit to DTSC three (3) separate draft RAWs, pursuant to the following submittal schedule:

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- Draft RAW for Extension of Covered Area – no later than thirty (30) days following the effective date of this Order;
- Draft RAW for Interim Relocation and Stabilization of Containerized Waste – no later than thirty (30) days following the effective date of this Order; and
- Draft RAW for Protection of Cell 8A from Intrusion of SET event – no later than ninety (90) days following the effective date of this Order.

Each draft RAW shall be prepared in accordance with Health and Safety Code sections 78130, and 79195–79240, and shall include the items listed below, at a minimum. This list is subject to change based on the site’s evolving characterization.

- a) A Site description which includes current site conditions, ownership and operational history, contamination and characterization activities conducted, and any response actions taken;
- b) The goals to be achieved by the removal actions identified in 5.1.2 of this Order;
- c) A Design and Implementation Plan. The design portion of the plan shall include, at a minimum, relevant criteria and final plans and specifications. The implementation portion of the plan shall detail, at a minimum, the techniques and methods to implement the removal activities, including any excavating, storing, handling, transporting, treating, and disposing of material on or off the Site;
- d) A Sampling and Analysis Plan with corresponding Quality Assurance/Quality Control (QA/QC) Plan to confirm the effectiveness of the RAW;
- e) A description of methods that will be employed during the removal action to ensure the health and safety of workers and the public during the removal action;
- f) A construction air monitoring plan to be executed in coordination with the ongoing site-wide air monitoring program;
- g) Design criteria and final plans and specifications for facilities to be constructed shall be prepared by a California licensed civil engineer;
- h) Description of equipment used to excavate, handle, and transport contaminated material;
- i) A field sampling and laboratory analysis plan addressing sampling during implementation and to confirm achievement of the performance objectives of the Workplan;

- j) A transportation plan identifying routes of travel and final destination of wastes generated and disposed, if necessary;
- k) An updated health and safety plan addressing the implementation activities;
- l) Identification of any necessary permits and agreements;
- m) An operation and maintenance plan including any required periodic and long-term monitoring;
- n) A detailed schedule for implementation of the removal action consistent with the schedule contained in the approved Workplan including procurement, mobilization, construction phasing, sampling, facility startup, and testing; and
- o) A construction quality assurance plan that includes quality assurance and testing procedures sufficient to ensure implemented removal actions meet the approved design(s) and specifications.

5.4 Workplan Implementation. DTSC shall review the draft RAWs and either approve them or provide comments to Respondents. If comments are provided, Respondents shall submit to DTSC for review within fifteen (15) days a revised draft RAW that addresses the comments. Upon DTSC approval of the final RAWs, Respondents shall implement the RAW in accordance with the approved schedule in the RAW. Within thirty (30) days of completion of field activities, Respondents shall submit an implementation report (“Implementation Report”) documenting the implementation of the final RAW.

5.5 Workplan Revisions. If Respondents propose to modify any methods or initiate new activities, Respondents shall prepare an addendum to the approved plan(s) for DTSC review and approval prior to modifying the method or initiating new activities. DTSC may propose to modify any methods or request new activities and request Respondents to prepare an addendum to the approved plan(s) for DTSC review and approval prior to modifying the method(s) or initiating new activities.

5.6 One-Year Review. After a period of one (1) year from the date of the Implementation Report, Respondents shall conduct an inspection of the Site and evaluate the adequacy and integrity of the completed removal actions. Thirty (30) days prior to the first anniversary of the Implementation Report, Respondents shall submit a workplan to describe such inspections and evaluations (“One-Year Review Workplan”) to DTSC for review and approval. Respondents shall implement the One-Year Review Workplan within sixty (60) days of its approval by DTSC, and Respondents shall submit a comprehensive report of the results of the removal action review. The report shall (a) describe the results of all sample analyses, tests, and other data generated or received by Respondents; and (b) evaluate the adequacy of the implemented removal action in protecting public health, safety, and the environment. As a result of any review performed under this Section, Respondents may be required to perform additional work as necessary to achieve the objectives of the approved RAW.

5.7 Changes During Implementation of the Workplan. During the implementation of the RAW(s), DTSC may specify such additions, modifications, and revisions to the Workplan as DTSC deems necessary to protect public health and safety or the environment or to implement the removal actions.

5.8 Stop Work Order. In the event that DTSC determines that any activity (whether or not pursued in compliance with this Order) may pose an imminent or substantial endangerment to the health or safety of people on the Site or in the surrounding area or to the environment, DTSC may order Respondents to stop further implementation of this Order, in full or in part, for such period of time needed to abate the endangerment. In the event that DTSC determines that any site activities (whether or not pursued in compliance with this Order) are proceeding without DTSC authorization, DTSC may order Respondents to stop further implementation of this Order (in full or in part) or activity for such period of time needed to obtain DTSC authorization, if such authorization is appropriate. Any deadline in this Order directly affected by a Stop Work Order, under this Section, shall be extended for the term of the Stop Work Order.

5.9 Emergency Response Action/Notification. In the event of any action or occurrence (such as a fire, earthquake, explosion, or human exposure to hazardous substances caused by the release or threatened release of a hazardous substance) during the course of this Order, Respondents shall immediately take all appropriate action to prevent, abate, or minimize such emergency, release, or immediate threat of release, and shall immediately notify the Project Manager. Respondents shall take such action in consultation with the Project Manager and in accordance with all applicable provisions of this Order. Within seven (7) days of the onset of such an event, Respondents shall furnish a report to DTSC, signed by Respondents' Project Coordinator, setting forth the events which occurred and the measures taken in the response thereto. In the event that Respondents fail to take appropriate response and DTSC takes the action instead, Respondents shall be liable to DTSC for all costs of the response action. Nothing in this Section shall be deemed to limit any other notification requirement to which Respondents may be subject.

5.10 Discontinuation of Removal Technology. Any technology employed in implementation of the removal actions shall be left in place and operated by Respondents until and except to the extent that DTSC authorizes Respondents in writing to discontinue, move or modify some or all of the technology because Respondents has met the criteria specified in the final RAW for its discontinuance, or because the modifications would better achieve the goals of future response actions.

5.11 Financial Assurance. Upon request, Respondents shall demonstrate to DTSC and maintain financial assurance for identified and approved operation and maintenance and monitoring activities. Respondents shall demonstrate financial assurance prior to the time that operation and maintenance activities are initiated and shall maintain it throughout the period of time necessary to complete all required operation and maintenance activities. The financial assurance mechanisms shall meet the requirements of Health and Safety Code sections 79310–79330. All financial assurance mechanisms are subject to the review and approval of DTSC.

5.12 California Environmental Quality Act (CEQA). DTSC finds that, due to the unique and special circumstances of the expanding SET event at the Site, immediate action is needed to prevent clear and imminent adverse effects to health and the environment. Accordingly, DTSC finds that the work needed to implement this Order is exempt from CEQA as an enforcement action pursuant to California Code of Regulations, title 14, section 15321(a); and as action necessary to prevent or mitigate an emergency, pursuant to Public Resources Code, sections 21060.3 and 21080(b)(4); and California Code of Regulations, title 14, section 15269(c).

VI. GENERAL PROVISIONS

6.1 Project Coordinator. Within seven (7) days from the date the Order is signed by DTSC, Respondents shall submit to DTSC in writing the name, address, and telephone number of a Project Coordinator whose responsibilities shall be to receive all notices, comments, approvals, and other communications from DTSC. Respondents shall promptly notify DTSC of any change in the identity of the Project Coordinator. Respondents shall obtain approval from DTSC before the new Project Coordinator performs any work under this Order.

6.2 Project Engineer/Geologist. The work performed pursuant to this Order shall be under the direction and supervision of a qualified professional engineer or a registered geologist in the State of California, with expertise in hazardous substance site cleanups. Within seven (7) days from the date this Order is signed by DTSC, Respondents must submit: (a) The name and address of the project engineer or geologist chosen by Respondents; and (b) in order to demonstrate expertise in hazardous substance cleanup, the resumé of the engineer or geologist, and the statement of qualifications of the consulting firm responsible for the work. Respondents shall promptly notify DTSC of any change in the identity of the Project Engineer/Geologist. Respondents shall obtain approval from DTSC before the new Project Engineer/Geologist performs any work under this Order.

6.3 Monthly Summary Reports. Within thirty (30) days from the effective date of this Order, and on a monthly basis thereafter, Respondents shall submit a Monthly Summary Report of its activities under the provisions of this Order. The report shall be received by DTSC by the fifteenth (15th) day of each month and shall describe:

- (a) Specific actions taken by or on behalf of Respondents during the previous calendar month;
- (b) Actions expected to be undertaken during the current calendar month;
- (c) All planned activities for the next month;
- (d) Any requirements under this Order that were not completed;
- (e) Any problems or anticipated problems in complying with this Order; and
- (f) All results of sample analyses, tests, and other data generated under this Order during the previous calendar month, and any significant findings from these data.

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6.4 Quality Assurance/Quality Control (QA/QC). All sampling and analysis conducted by Respondents under this Order shall be performed in accordance with QA/QC procedures submitted by Respondents and approved by DTSC pursuant to this Order.

6.5 Submittals. All submittals and notifications from Respondents required by this Order shall be sent electronically to:

Department of Toxic Substances Control
Attn: Daniel V. Ziarkowski, Branch Chief & Peter Ruttan, Project
Manager
Site Mitigation and Restoration Program
Legacy Landfills Office
8800 Cal Center Drive
Sacramento, CA 95826
dan.ziarkowski@dtsc.ca.gov
peter.ruttan@dtsc.ca.gov

6.6 Communications. All approvals and decisions of DTSC made regarding submittals and notifications shall be communicated to Respondents in writing by the Site Mitigation Branch Chief, or his/her designee. No informal advice, guidance, suggestions, or comments by DTSC regarding reports, plans, specifications, schedules, or any other writings by Respondents shall be construed to relieve Respondents of the obligation to obtain such formal approvals as may be required.

6.7 DTSC Review and Approval. All response actions taken pursuant to this Order shall be subject to the approval of DTSC.

- a) Respondents shall submit all deliverables required by this Order to DTSC. Once the deliverables are approved by DTSC, they shall be deemed incorporated into, and where applicable, enforceable under this Order.
- b) If DTSC determines that any report, plan, schedule, or other document submitted for approval pursuant to this Order fails to comply with this Order or fails to protect public health or safety or the environment, DTSC may:
 - 1) Modify the document as deemed necessary and approve the document as modified; or
 - 2) Return comments to Respondents with a description of needed changes and a date by which Respondents must submit to DTSC a revised document incorporating the changes.
- c) Any modifications, comments, or other directives issued pursuant to this Section, are incorporated into this Order. Any noncompliance with these modifications or directives shall be deemed a failure or refusal to comply with this Order.

6.8 Compliance with Applicable Laws. Nothing in this Order shall relieve Respondents from complying with all other applicable laws and regulations, including but not limited to compliance with all applicable waste discharge requirements issued by the State Water Resources Control Board or a California Regional Water Quality Control Board. Respondents shall conform all actions required by this Order with all applicable federal, state, and local laws and regulations.

6.9 Respondents Liabilities. Nothing in this Order shall constitute or be construed as a satisfaction or release from liability for any conditions or claims arising as a result of past, current or future operations of Respondents. Nothing in this Order is intended or shall be construed to limit the rights of any of the parties with respect to claims arising out of or relating to the deposit or disposal at any other location of substances removed from the Site. Nothing in this Order is intended or shall be construed to limit or preclude DTSC from taking any action authorized by law to protect public health or safety or the environment and recovering the cost thereof. Notwithstanding compliance with the terms of this Order, Respondents may be required to take further actions as necessary to protect public health and the environment.

6.10 Site Access. Access to the Site (and laboratories used for analyses of samples, when necessary) under this Order shall be provided at all reasonable times to employees, contractors, and consultants of DTSC. Nothing in this Section is intended or shall be construed to limit in any way the right of entry or inspection that DTSC or any other agency may otherwise have by operation of any law. DTSC and its authorized representatives shall have the authority to enter and move freely about all property at the Site at all reasonable times for purposes including, but not limited to: inspecting records, operating logs, sampling and analytic data, and contracts relating to this Site; reviewing the progress of Respondents in carrying out the terms of this Order; conducting such tests as DTSC may deem necessary; and verifying the data submitted to DTSC by Respondents.

To the extent the Site or any other property to which access is required for the implementation of this Order is owned or controlled by persons other than Respondents, Respondents shall use best efforts to secure from such persons access for Respondents, as well as DTSC, its representatives, and contractors, as necessary to effectuate this Order. To the extent that any portion of the Site is controlled by tenants of Respondents, Respondents shall use best efforts to secure from such tenants, access for Respondents, as well as for DTSC, its representatives, and contractors, as necessary to effectuate this Order. For purposes of this Section, “best efforts” includes the payment of reasonable sums of money in consideration of access. If any access required to complete the Work is not obtained within forty-five (45) days of the effective date of this Order, or within forty-five (45) days of the date DTSC notifies Respondents in writing that additional access beyond that previously secured is necessary, Respondents shall promptly notify DTSC, and shall include in that notification a summary of the steps Respondents has taken to attempt to obtain access. DTSC may, as it deems appropriate, assist Respondents in obtaining access. Respondents shall reimburse DTSC in obtaining access, including, but not limited to, attorneys fees and the amount of just compensation.

6.11 Sampling, Data and Document Availability. Respondents shall permit DTSC and

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its authorized representatives to inspect, and review, and Respondents shall provide in electronic format, as requested, any and all copies of all sampling, testing, monitoring, or other data, including raw data, generated by Respondents or on Respondents' behalf, in any way pertaining to work undertaken pursuant to this Order, or related to monitoring the SET event and associated conditions at the Site. Such data includes, but is not limited to:

- a) All raw data generated regarding temperature data at CCL, and any prepared graphs, in .txt format;
- b) All raw data generated regarding down well temperatures;
- c) All raw data generated regarding gas well head temperatures;
- d) All raw data generated regarding leachate production and any characterization;
- e) All raw data generated regarding landfill gas production and any characterization;
- f) All raw data generated via unmanned aerial vehicles (UAVs);
- g) All raw data generated regarding perimeter gas wells;
- h) All raw data generated regarding landfill gas pressures;
- i) All raw data and reports generated regarding slope stability;
- j) All raw data regarding survey benchmark and monuments, including process used to establish the datum;
- k) All aerial or photographic images, surveys, and scans of the facility, fissures, tension cracks, cover tears, leachate outbreaks or pools, and storage tanks taken since January 2022;
- l) All raw landfill gas data including notes;
- m) A copy of all current Standard Operating Procedures (SOPs), including but not limited to, the SOPs for landfill gas and leachate collection and treatment;
- n) Continuous web access to all data stored online including TMPs, FLIR images, and gas data.

Respondents shall submit all such data upon the request of DTSC. Copies shall be provided within seven (7) days of receipt of DTSC's written request. Respondents shall inform DTSC at least seven (7) days in advance of all field sampling under this Order, and Respondents shall allow DTSC and its authorized representatives to take duplicates of any samples collected by Respondents pursuant to this Order. Respondents shall maintain a central depository of the data, reports, and other documents prepared pursuant to this Order.

6.12 Record Retention. All such data, reports, and other documents shall be preserved by Respondents for a minimum of five (5) years after the conclusion of all activities under this Order. If DTSC requests that some or all of these documents be preserved for a longer period of time, Respondents shall either comply with that request, deliver the documents to DTSC, or permit DTSC to copy the documents prior to destruction. Respondents shall notify DTSC in writing at least six (6) months prior to destroying any documents prepared pursuant to this Order.

6.13 Government Liabilities. The State of California shall not be liable for any injuries or damages to persons or property resulting from acts or omissions by Respondents, or related parties specified in Section 6.25, Parties Bound, in carrying out activities pursuant to this Order, nor shall the State of California be held as party to any contract entered into by Respondents or its agents in carrying out activities pursuant to this Order.

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6.14 Additional Actions. By issuance of this Order, DTSC does not waive the right to take any further actions authorized by law.

6.15 Extension Requests. If Respondents are unable to perform any activity or submit any document within the time required under this Order, Respondents may, prior to expiration of the time, request an extension of the time in writing. The extension request shall include a justification for the delay. All such requests shall be in advance of the date on which the activity or document is due.

6.16 Extension Approvals. If DTSC determines that good cause exists for an extension, it shall grant the request and specify a new schedule in writing. Respondents shall comply with the new schedule incorporated in this Order.

6.17 Liability for Costs. Respondents are liable for all of DTSC's costs that have been incurred in taking response actions at the Site (including costs of overseeing response actions performed by Respondents) and costs to be incurred in the future.

6.18 Payment of Costs. DTSC may bill Respondents for costs incurred in taking response actions at the Site prior to the effective date of this Order. DTSC shall bill Respondents quarterly for its response costs incurred after the effective date of this Order. Respondents shall pay DTSC within sixty (60) days of receipt of any DTSC billing. Any billing not paid within sixty (60) days is subject to interest calculated from the date of the billing pursuant to Health and Safety Code section 79655. All payments made by Respondents pursuant to this Order shall be by cashier's or certified check made payable to this "DTSC," and shall bear on the face the project code of the Site (Site Code 302132-00) and the Docket number of this Order. Payments shall be sent to:

Department of Toxic Substances Control
Accounting/Cashier
1001 I Street, 21st Floor
P.O. Box 806
Sacramento, California 95812-0806

A photocopy of all payment checks shall also be sent to the person designated by DTSC to receive submittals under this Order.

6.19 Severability. The requirements of this Order are severable, and Respondents shall comply with each and every provision hereof, notwithstanding the effectiveness of any other provision.

6.20 Incorporation of Plans, Schedules, and Reports. All plans, schedules, reports, specifications, and other documents that are submitted by Respondents pursuant to this Order are incorporated in this Order upon DTSC's approval or as modified pursuant to Section 6.7, DTSC Review and Approval, and shall be implemented by Respondents. Any noncompliance with the documents incorporated in this Order shall be deemed a failure or refusal to comply with this

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Order.

6.21 Modifications. DTSC reserves the right to unilaterally modify this Order. Any modification to this Order shall be effective upon the date the modification is signed by DTSC and shall be deemed incorporated in this Order.

6.22 Time Periods. Unless otherwise specified, time periods begin from the effective date of this Order and “days” means calendar days.

6.23 Termination and Satisfaction. Except for Respondents obligations under Sections 5.6 One-Year Review, 6.12 Record Retention, 6.17 Liability for Costs, and 6.18 Payment of Costs, Respondents obligations under this Order shall terminate and be deemed satisfied upon Respondents receipt of written notice from DTSC that Respondents has complied with all the terms of this Order.

6.24 Calendar of Tasks and Schedules. This Section is merely for the convenience of listing in one location the submittals required by this Order. If there is a conflict between the date for a scheduled submittal within this Section and the date within the Section describing the specific requirement, the latter shall govern.

Calendar of Tasks and Schedules

TASK	SCHEDULE
1. Provide written notice of whether Respondents intend to comply with Order; Section 7	Within seven (7) days of the effective date of this Order.
2. Schedule and attend Site Response Strategy Meeting; Section 5.1.3	Within seven (7) days of the effective date of this Order.
3. Identify Project Coordinator; Section 6.1	Within seven (7) days of the effective date of this Order.
4. Provide requested sampling, data, and documentation; Section 6.11	Within seven (7) days of receipt of DTSC’s request.
5. Identify Project Engineer/Geologist; Section 6.2	Within seven (7) days of the effective date of this Order.

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TASK	SCHEDULE
6. Submit Monthly Report(s); Section 6.3	Within thirty (30) days of the effective date of this Order; then every month thereafter, by the 15 th day of each month, until satisfaction of all obligations under this Order.
7. Submit Draft Removal Action Workplan for Extension of Covered Area; Section 5.3	Within thirty (30) days of the effective date of this Order.
8. Submit Draft Removal Action Workplan for Interim Relocation and Stabilization of Containerized Waste; Section 5.3	Within thirty (30) days of the effective date of this Order.
9. [If DTSC Issues Comments to Draft RAW(s)] Submit Revised Draft Removal Action Workplan(s); Section 5.4	Within fifteen (15) days of the receipt of comments on Draft RAW(s) from DTSC.
10. Submit Draft Removal Action Workplan for Protection of Cell 8A from Intrusion of SET event; Section 5.3	Within ninety (90) days of the effective date of this Order.
11. Submit Implementation Report; Section 5.4	Within thirty (30) days of the completion of field activities required under this Order.
12. Submit One-Year Review Workplan; Section 5.6	At least thirty (30) days prior to the first anniversary of the submission of the Implementation Report.
13. Implement One-Year Review Workplan; Section 5.6	Within sixty (60) days of DTSC approval of One-Year Review Workplan.
14. Submit One-Year Review Report; Section 5.6	Within sixty (60) days of DTSC approval of One-Year Review Workplan.
15. Maintain central depository of data, reports, and documentation; Section 6.12	At least five (5) years after conclusion of all activities conducted pursuant to this Order.
16. Provide prior written notice to DTSC before destroying any documentation prepared pursuant to this Order; Section 6.12	At least six (6) months prior to destroying any documents.

6.25 Parties Bound. This Order applies to and is binding upon Respondents, and their officers, directors, agents, employees, contractors, consultants, receivers, trustees, successors and assignees, including but not limited to, individuals, partners, and subsidiary and parent

ISE Order – Chiquita Canyon Landfill
April 1, 2025

corporations. Respondents shall provide a copy of this Order to all contractors, subcontractors, laboratories, and consultants which are retained to conduct any work performed under this Order, within fifteen (15) days after the effective date of this Order or the date of retaining their services, whichever is later. Respondents shall condition any such contracts upon satisfactory compliance with this Order. Notwithstanding the terms of any contract, Respondents are responsible for compliance with this Order and for ensuring that its subsidiaries, employees, contractors, consultants, subcontractors, agents, and attorneys comply with this Order.

6.26 Change in Ownership. No change in ownership or corporate or partnership status relating to the Site shall in any way alter Respondents' responsibility under this Order. No conveyance of title, easement, or other interest in the Site, or a portion of the Site, shall affect Respondents' obligations under this Order. Unless DTSC agrees that such obligations may be transferred to a third party, Respondents shall be responsible for and liable for any failure to carry out all activities required of Respondents by the terms and conditions of this Order, regardless of Respondents' use of employees, agents, contractors, or consultants to perform any such tasks. Respondents shall provide a copy of this Order to any subsequent owners or successors before ownership rights or stock or assets in a corporate acquisition are transferred.

6.27 Non-Duplication and Consistency with Other Orders. To ensure regulatory consistency and avoid unnecessary duplication, this Order shall be interpreted and implemented in a manner that does not conflict with or duplicate any existing orders issued by federal, state, or local agencies addressing the same or substantially similar conditions at the Site. Respondents may request modifications to this Order to reconcile apparent inconsistencies with other orders, and may request clarification or permission to avoid duplicative administrative requirements, if applicable.

VII. NOTICE OF INTENT TO COMPLY

7. Not later than seven (7) days after the effective date of this Order, Respondents shall provide written notice, in accordance with Section 6.5 of this Order, stating whether or not Respondents shall comply with the terms of this Order. If Respondents, or any one of them, do not unequivocally commit to perform all of the requirements of this Order, they, or each so refusing, shall be deemed to have violated this Order and to have failed or refused to comply with this Order. Respondents' written notice shall describe, using facts that exist on or prior to the effective date of this Order, any "sufficient cause" defenses asserted by Respondents under Health and Safety Code sections 78870 and 79055(a)(1)(B) or CERCLA section 107(c)(3), 42 U.S.C. section 9607(c)(3).

VIII. EFFECTIVE DATE

8. This Order is final and effective on the date of service.

IX. PENALTIES FOR NONCOMPLIANCE

9. Each Respondent may be liable for penalties of up to \$25,000 for each day out of compliance with any term or condition set forth in this Order and for punitive damages up to

***ISE Order – Chiquita Canyon Landfill
April 1, 2025***

three times the amount of any costs incurred by DTSC as a result of Respondents' failure to comply, pursuant to Health and Safety Code sections 78470(c), 78665, 78675, 78680, 79550, 79555, and 79570. Health and Safety Code section 79555 provides that a responsible party who complies with this Order, or with another order or agreement concerning the same response actions required by this Order, may seek treble damages from Respondents who fail or refuse to comply with this Order without sufficient cause.

***ISE Order – Chiquita Canyon Landfill
April 1, 2025***

DATE OF ISSUANCE: April 1, 2025

Elizabeth Anne Berg
Deputy Director
Site Mitigation and Restoration Program
Department of Toxic Substances Control

cc: Site Mitigation and Restoration Program
Headquarters, Planning & Policy
Office of Legal Counsel

CSC – Lawyers Incorporating Service
2710 Gateway Oaks Drive, Suite 150N
Sacramento, CA 95833
Corporate Registered Agent for Chiquita Canyon, LLC, Chiquita Canyon, Inc., and Waste
Connections US, Inc.

EXHIBIT 1

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About

About Chiquita Canyon

Chiquita Canyon is a 639-acre landfill located in Castaic, California, approximately 3 miles west of the Interstate 5 on State Route 126 in the Santa Clarita Valley. It has been in continuous operation for nearly 50 years and is owned and operated by Waste Connections, an integrated solid waste services company. Chiquita Canyon has provided the Santa Clarita Valley and surrounding Los Angeles communities with environmentally safe and efficient waste disposal services.



Chiquita Canyon only accepts non-hazardous solid waste for disposal. The solid waste received at the site consists of municipal solid waste, residential and commercial waste, including yard waste, Green Waste (for composting or for recycling), clean fill soil and construction/demolition debris.

Since it began operating in 1972, Chiquita Canyon has been an active member of the Santa Clarita Valley, participating in community events and contributing to local organizations and programs. Through the Val Verde Community Benefits Funding Committee Chiquita Canyon has been an active supporter of Val Verde civic programs.

Chiquita Canyon, like other solid waste landfills, over time generates a greenhouse gas, methane, which can be safely converted into a valuable source of clean energy. Chiquita deploys a gas recovery system to collect methane which is then used to generate electricity for nearly 10,000 homes each year.

Conditional Use Permit – CUP 2004-00042

About Waste Connections

Waste Connections is an integrated solid waste services company that provides solid waste collection, transfer, disposal and recycling services in mostly secondary markets in the Western and Southern U.S. The Company serves more than one million residential, commercial and industrial customers from a network of operations in 23 states. We also provide intermodal services for the movement of containers in the Pacific Northwest.

We believe the solid waste service business is a local business managed by professionals living and working in the communities we serve. We strive to provide service excellence for those communities that place their trust in our company and are always dedicated to putting our customers first. We look to technology and growth to help our customers, employees and shareholders “Connect with the Future”. As a public company we have the resources to meet every customer’s needs in a cost effective and environmentally compatible manner. We understand the markets, the philosophy and the unique needs of the customers we serve whether they be industry, commercial accounts, municipal jurisdictions or individual subscribers.

Our Operating Values

Safety. We strive to assure complete safety of our employees, our customers and the public in all of our operations. Protection from accident or injury is paramount in all we do.

Integrity. We define integrity as “saying what you will do and then doing it.” We keep our promises to our customers, our employees and our stockholders. Do the right thing, at the right time, for the right reason.

Customer Service. We provide our customers the best possible service in a courteous, effective manner, showing respect for those we are fortunate to serve.

To be a Great Place To Work. We maintain a growth culture where our employees can maximize their potential personally and professionally. Our objective is to provide an environment where people enjoy what they do and take pride in their work. We wish to embody a work hard, play harder culture.

To be the Premier Solid Waste Services Company in the U.S. We continue to provide superior returns, remain environmentally responsible, and continue to grow in a disciplined way, deploying resources intelligently and benefiting communities we live in. We remain a “different breed”.

Want to receive alert notifications? [Sign up](#)



Chiquita Canyon is a 639-acre landfill located in Castaic, California, on State Route 126 in the Santa Clarita Valley.

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Hours of Operation

General Public

Monday – Friday - 7 am - 4 pm
Saturday - 7 am - 2 pm
Sunday - closed

Commercial Customers

Monday – Friday - 4 am - 5 pm
Saturday - 4 am - 2 pm
Sunday - closed

Contact

info@chiquitacanyon.com

Odor Mitigation - (661) 253-5155

Business Office - (661) 257-3655

After Hours - (877) 263-2561

(Bilingual Operators)

29201 Henry Mayo Dr.
Castaic, CA 91384

[Get directions](#)

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English



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About

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Effective January 1, 2025, Chiquita Canyon Landfill will be closed for the acceptance of waste. Chiquita Canyon, LLC will continue to manage the landfill, including addressing the elevated temperature landfill event that is affecting the northwest corner of the landfill, as well as closure and post-closure activities. While active waste disposal operations will close, we remain committed to working with federal, state and local regulators on the ongoing reaction mitigation efforts.

About

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Chiquita Canyon is a
639-acre landfill
located in Castaic,
California, on State
Route 126 in the Santa
Clarita Valley.

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Hours of Operation

Contact

info@chiquitacanyon.com
Odor Mitigation - (661)
253-5155
Business Office - (661)
257-3655
After Hours - (877) 263-
2561
(Bilingual Operators)

29201 Henry Mayo Dr.
Castaic, CA 91384
[Get directions](#)

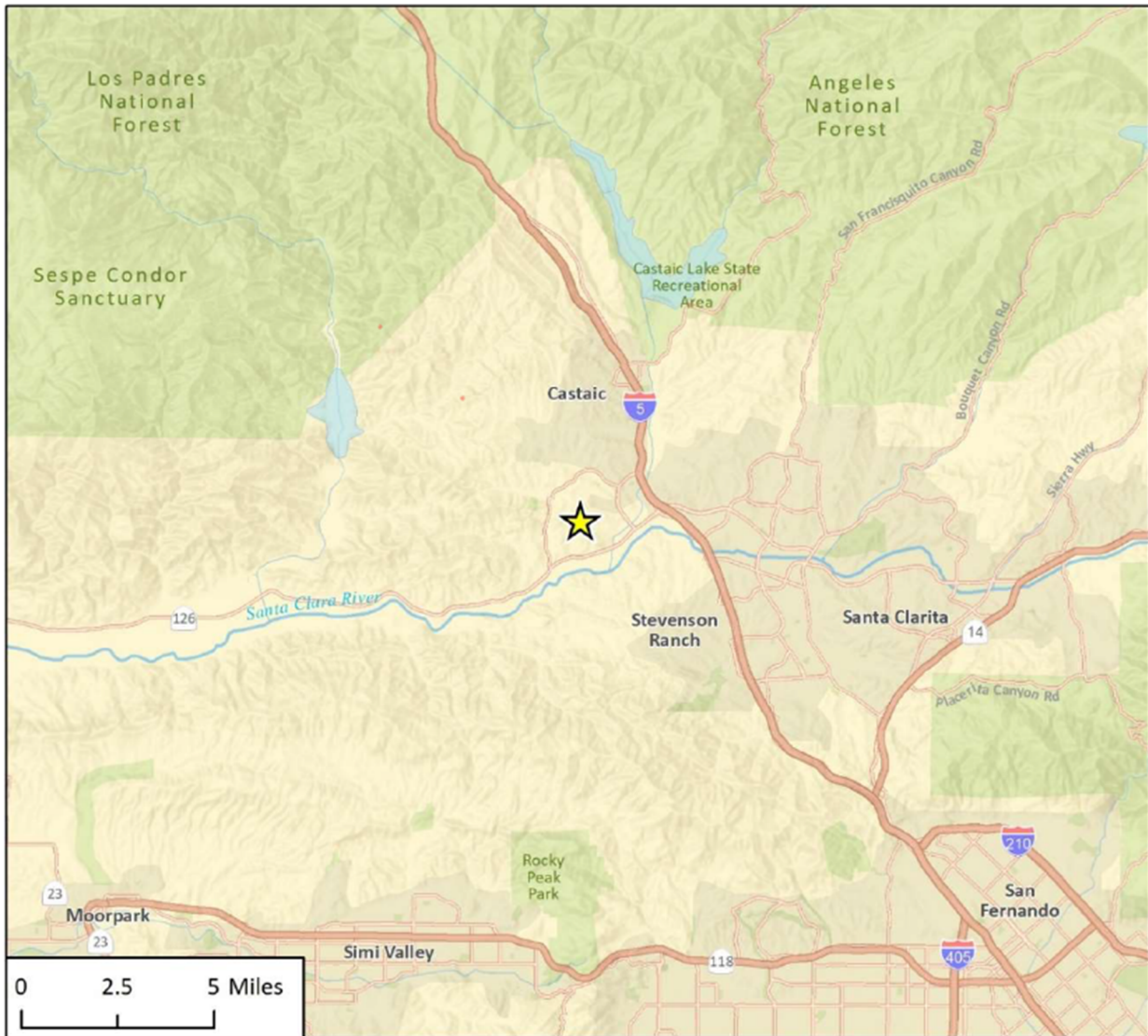
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EXHIBIT 2



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Not to Scale



★ CCL Location



Not to Scale



EXHIBIT 3

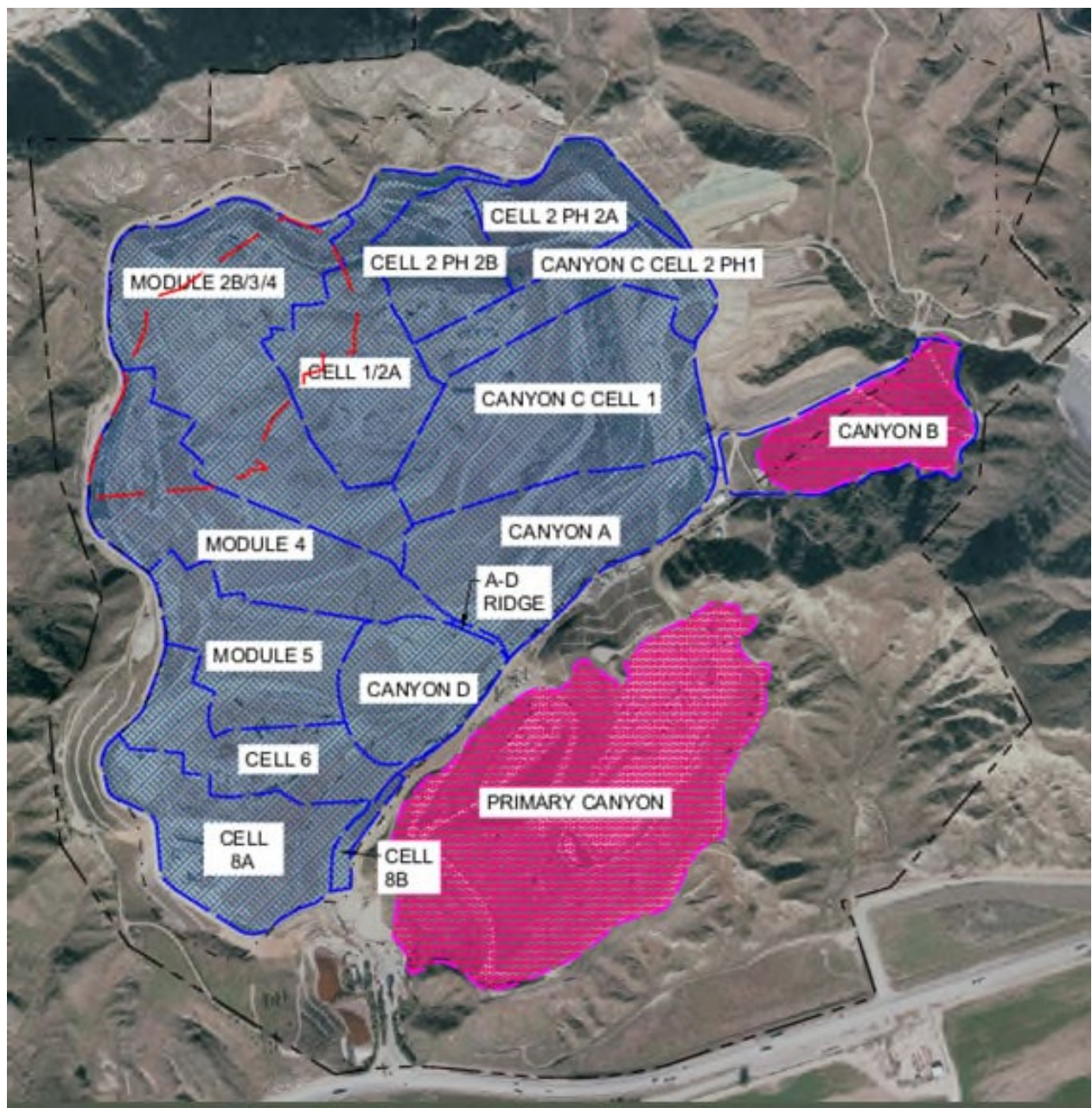


EXHIBIT 4

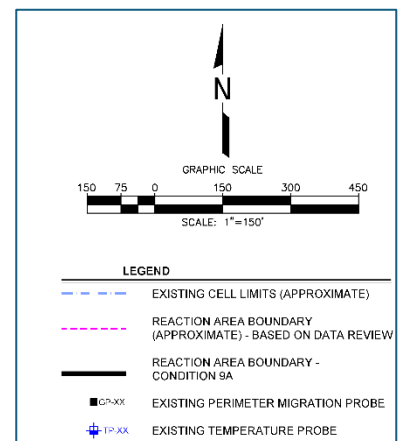
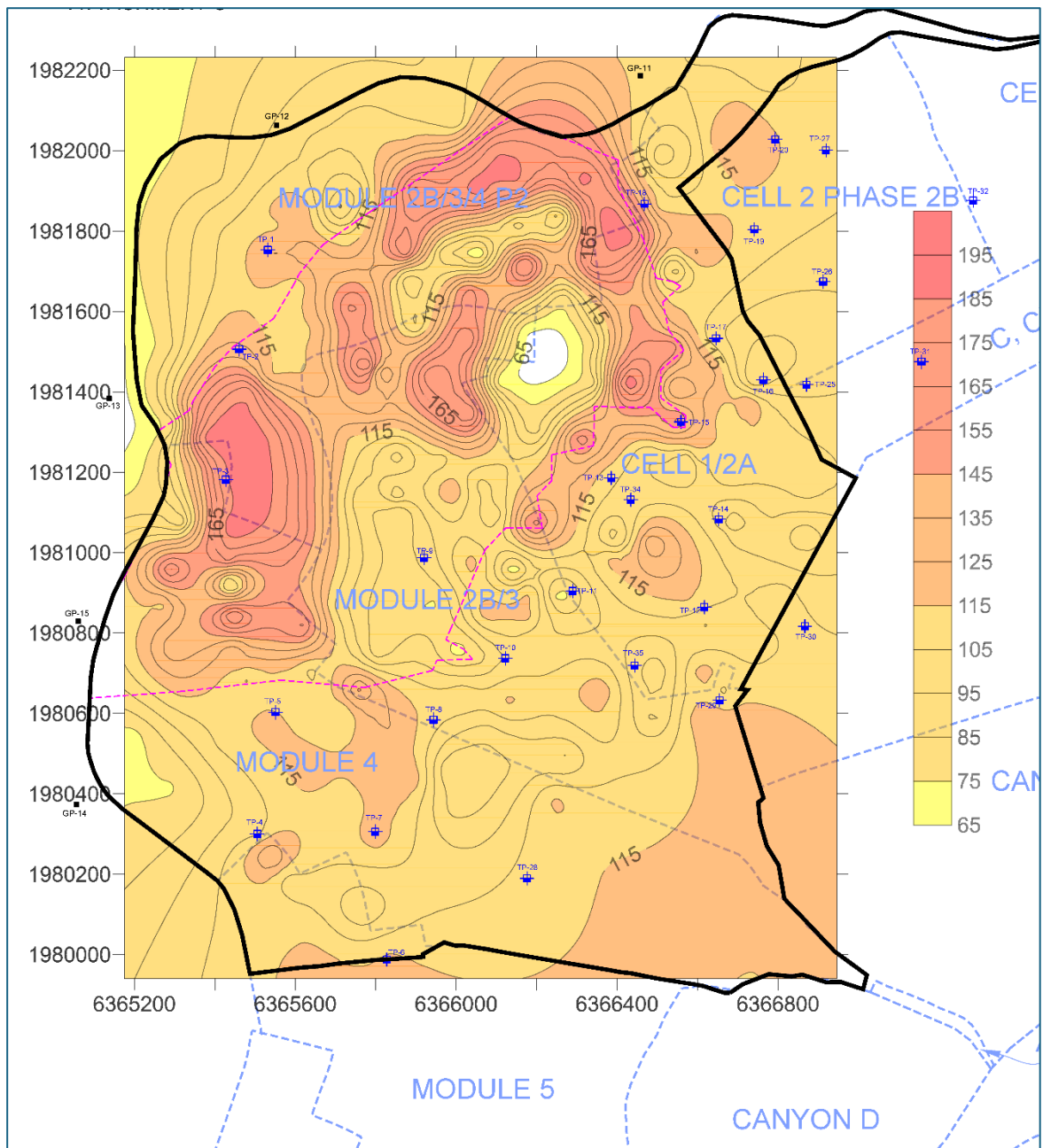


EXHIBIT 5

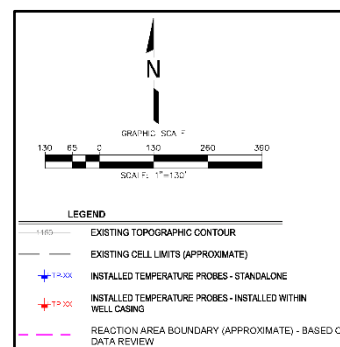
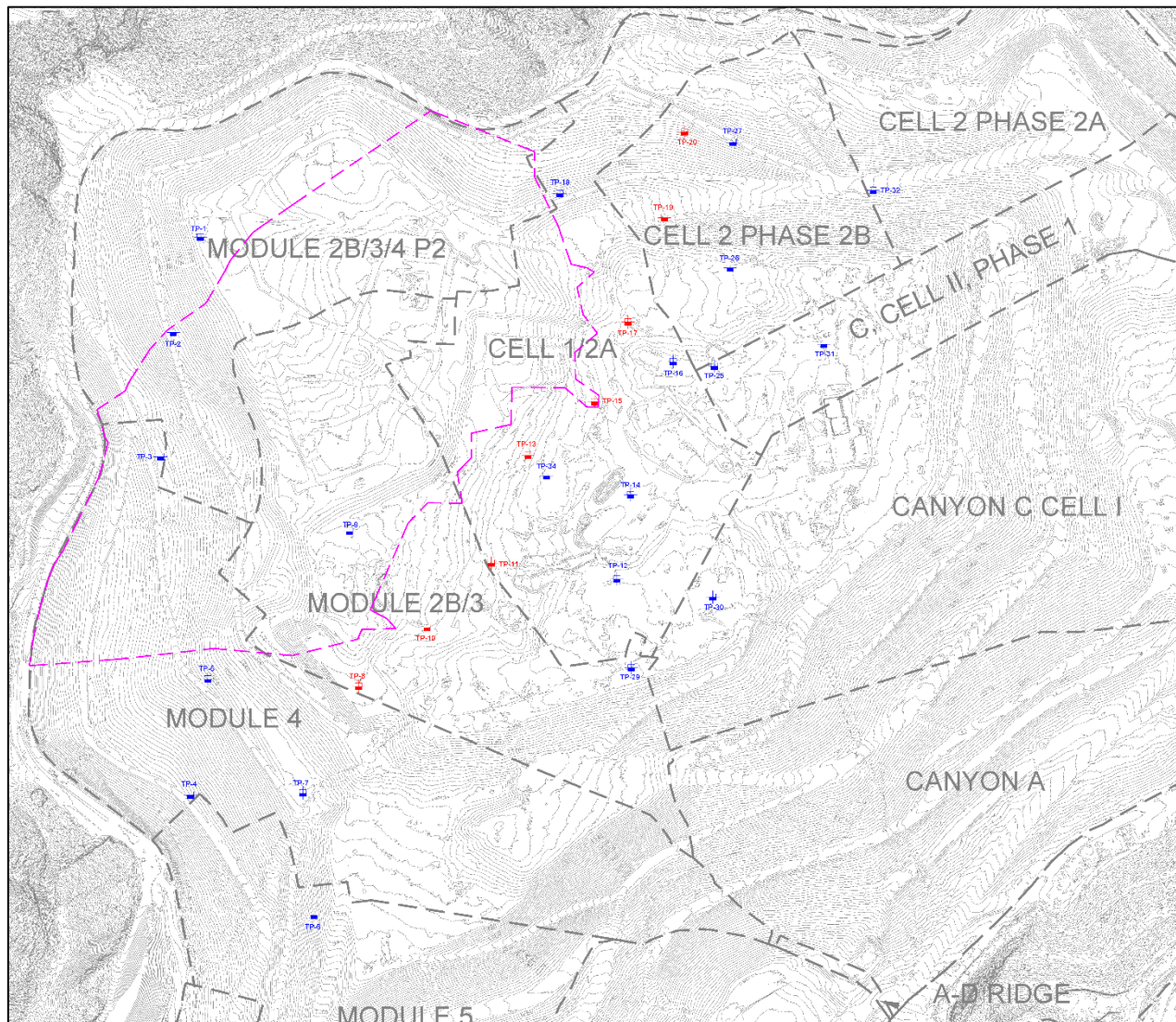


EXHIBIT 6

TIMOTHY D. STARK, Ph.D., P.E., BC.GE

Stark Consultants, Inc., 401 W. Indiana Avenue, Urbana, Illinois, 61803; tstark32@gmail.com; (217) 840 - 8263

To: Mr. Matthew Dwyer
Senior Project Manager
Regional Manager
Engineering/Remediation Resources Group, Inc. (ERRG, Inc.)
9727 Business Park Drive, Suite A
Sacramento, CA 95827
matthew.dwyer@errg.com

From: Timothy Stark, Ph.D., P.E., BC.GE, Dist.M.ASCE

Date: February 26, 2025

RE: Comments on November 26, 2024 Revised Soil Reaction Break/Barrier Plan and February 20, 2025 waste temperature data for Chiquita Canyon Landfill Subsurface Elevated Temperature (SET) Event

Pursuant to your request and Task Order #1 under my contract with ERRG, I have reviewed the November 26, 2024 Revised Soil Reaction Break/Barrier Plan¹, waste temperature data provided by SCS dated February 20, 2025², and the weekly tracking of fissures and tension cracks in the impacted area dated February 17, 2025³ and submitted by the Chiquita Canyon Landfill (CCL) operated by Waste Connections, Incorporated to the Legal Enforcement Agency (LEA) on February 25, 2025.

Landfill Location and Description:

The CCL is located at 29,201 Henry Mayo Drive, Castaic, California, in northern Los Angeles County. This facility is a Class III non-hazardous municipal solid waste (MSW) landfill. The 639-acre landfill site began accepting waste in 1972. The landfill can receive up to 12,000 tons of MSW per day. The average daily tonnage in 2021 was reported to be 6,412 tons. The CCL only accepts non-hazardous solid waste for disposal, including municipal solid waste, green waste for composting or recycling, construction and demolition debris, and e-waste for recycling. The facility is prohibited from accepting hazardous waste that is ignitable, corrosive, reactive, or toxic. The landfill also does not accept biohazardous waste, household hazardous waste, radioactive materials, incinerator ash, sludge, automobile shredder fluff, or liquid waste.

The landfill site is a former limestone quarrying and crushing operation which began in 1939 and ended in 1988. The quarrying resulted in two quarry pits, the North Quarry Pit and the South Quarry Pit, which were excavated to a maximum depth of 240 feet below ground surface (bgs). The north and south quarry portions cover an area of approximately 52 acres.

¹ SCS Engineers, Revised Soil Reaction Break/Barrier Plan: Chiquita Canyon Landfill, Castaic, California, South Coast AQMD Facility No. 119219, Project #: 01204123.21-13, November 26, 2024, 198 p.

² SCS Engineers, Solid Waste Borehole Maximum Temperature Profiles Over 6 Weeks for 1/9/2025 to 2/19/2025, Project #: 07224053.00, February 20, 2025, 31 p.

³ Chiquita Canyon, Weekly Report - 4050 Chiquita Reaction Area Tracking of Fissures and Tension Cracks, by Nancy Bahena Hernandez, February 17, 2025, 39 p.

Landfilling began in the North Quarry Pit in 1974 and continued in this area until 1985. In 1985, the landfill underwent expansion to the southwest into the area known as the South Quarry Pit. This continued until August 2005 when the landfill stopped accepting waste to reduce the potential for birds to interfere with nearby airport operations. The total waste thickness is approximately 320 feet which means about 80 feet is above ground surface and about 240 feet is below ground surface. The landfill accepted approximately 17,000,000 in-place cubic yards of waste, including commercial, and municipal solid wastes.

The permitted landfill disposal footprint totals 257 acres and is comprised of three separate areas designated as “Primary” Canyon, “Canyon B,” and the Main Canyon (including Canyons A, C, D and subsequent fill modules). Currently, 231 acres of the footprint have been used for disposal. All areas except the Primary Canyon have geosynthetic bottom liner systems and leachate collection and removal systems. Leachate is collected and trucked off-site, but condensate from the gas extraction wells is injected into the flare.

Revised Barrier Plan:

The Revised Barrier Plan states a:

“discrete portion of the waste mass in the northwestern section of the Landfill is experiencing elevated temperature landfill (ETLF) conditions. ETLF conditions can generally be characterized as when the typical waste decomposition processes and corresponding methanogenesis associated with anaerobic digestion of organic solid waste materials disposed in a landfill are impeded because of heat accumulation. As a result, certain abiotic (non-biological) processes and chemical reactions within the buried wastes occur instead.”

Even though SCS Engineers (SCS) claims the Subsurface Elevated Temperature (SET) Event only is impacting a “discrete portion of the waste mass”, they review five options for isolating and containing the SET Event to impede heat flow into other adjacent portions of the waste mass. These five options are:

- (1) Air Break through avoidance of placement of additional waste lifts overlying existing buried wastes.
- (2) Air Break through excavation to “cut out” existing buried wastes.
- (3) Soil Barrier through placement of soil layer atop existing landfill surface.
- (4) Soil Barrier through excavation and backfilling of a deep trench.

5) Inert Material Barrier through Borehole Drilling, Dewatering, and Flowable Fill Injection.

SCS concludes an air break through avoidance of additional waste placement (option #1) or excavation (option #2) are “implausible” and thus are not being pursued by CCL. In addition, SCS deemed option #4 (soil barrier through excavation and backfilling) “implausible”, and the technology involved in introducing an inert material for Option #5 “uncertain”. As a result, options #4 and #5 are not being pursued by CCL.

Option #3 was deemed by SCS to be the “most plausible and may accomplish the desired objective without incurring substantial environmental and safety risks.” Option #3 simply involves placing additional soil over the top of the landfill, i.e., to create a thicker soil cover. This option will be less effective for controlling odors and emissions from CCL than a geomembrane cover (discussed below) because of many issues including inadequate soil compaction especially on the sideslopes, differential settlement causing cracks in the soil cover, and creation of desiccation cracks during the hot and dry months.

The Revised Soil Reaction Break/Barrier Plan⁴ was issued on November 26, 2024, which is important because CCL claims:

“CCL has implemented extensive mitigation measures that reduce the likelihood that CCL will need to construct any form of the various reaction break concepts, including CCL’s proposed additional mitigation measures. Previous experience at other ETLF landfills demonstrates that landfill reactions and resulting odors have been mitigated by best management practices, including increased gas extraction and liquid removal (e.g., through expanding systems and providing adequate LFG control capacity and leachate disposal capacity). Another best management practice is to improve cover integrity, which reduces infiltration of precipitation and limits the amount of excess liquids available to sustain various chemical reactions. Implementing these measures will help slow the reaction, impede the spread of the reaction to new areas, and mitigate impacts.”

“Further, Chiquita is constantly monitoring the landfill for signs of potential ETLF conditions so that it can react quickly in the event of changing conditions. CCL and SCS are confident that implementation of the best management practices developed by the landfill industry and EPA to contain and manage the reaction will succeed in slowing the propagation of the reaction area. Other landfills that have experienced widespread ETLF heating events during the past approximately 15 years have

⁴ SCS Engineers, Revised Soil Reaction Break/Barrier Plan: Chiquita Canyon Landfill, Castaic, California, South Coast AQMD Facility No. 119219, Project #: 01204123.21-13, November 26, 2024, 198 p.

successfully utilized these tools to contain those events. Continued application of the current mitigation measures will result in cooling of the buried wastes, which enable methanogenesis to ultimately be re-initiated within a large section of the affected waste mass. This in turn will mitigate and abate the detrimental impacts, such as odors, being experienced by surrounding off-site communities.”

Unfortunately, the waste temperature data released on February 20, 2025⁵ shows these “best management practices” have not “helped slow the reaction, impede the spread of the reaction to new areas, and mitigate impacts” as claimed by CCL and SCS above, as discussed in the next section. In summary, the removal of “hot” gas and leachate has not been successful in containing the SET Event.

Summary of Recent Temperature Data

SCS presents Waste Borehole Maximum Temperature Profiles Over 6 Weeks from January 9, 2025 to February 19, 2025.⁶ An aerial image of CCL with a table of maximum temperatures is included in the subject SCS Report and reproduced in **Figure 1**. I have placed the maximum waste temperature from the table in **Figure 1** adjacent to some of the gas extraction wells to facilitate understanding the extent of the SET Event, especially on the east side of CCL. **Figure 1** shows waste temperatures of 183°F and 185°F at the eastern side of the top deck of the CCL. This means the SET Event has migrated from the western slope (TP03) to the eastern side of the CCL (TP31). Expansion of the SET Event has the following implications:

- Elevated temperatures (185°F to 189°F) surround the leachate tank farm (see red arrow in **Figure 1**). This area is going to undergo significant settlement, if it has not already started to do so, due to thermal breakdown of the buried waste. This settlement will cause differential movement of the leachate tanks, which could result in a leachate release. As a result, I recommend the leachate tank farm be moved off the top deck and to a site off the CCL and on native soil because the SET Event continues to expand.
- Waste temperatures of 183°F and 185°F are already present on the eastern side of the top deck of the CCL. As a result, it is not possible to “isolate and contain” this SET Event using a north-south vertical barrier as previously discussed. Thus, the only option for controlling odors and emissions is to cover the area with a geomembrane (discussed below) over which the temperature monitoring probes (TPs) have been installed. This means the geomembrane should cover from the west to the east side of the CCL and from the north

⁵ SCS Engineers, Solid Waste Borehole Maximum Temperature Profiles Over 6 Weeks for 1/9/2025 to 2/19/2025, Project #: 07224053.00, February 20, 2025, 31 p.

⁶ SCS Engineers, Solid Waste Borehole Maximum Temperature Profiles Over 6 Weeks for 1/9/2025 to 2/19/2025, Project #: 07224053.00, February 20, 2025, 31 p.

end to just south of TP06 shown in **Figure 1**. In other words, the exposed geomembrane cover would cover about 183 acres and leave only about 13 acres at the southern end of the CCL uncovered for current disposal operations.

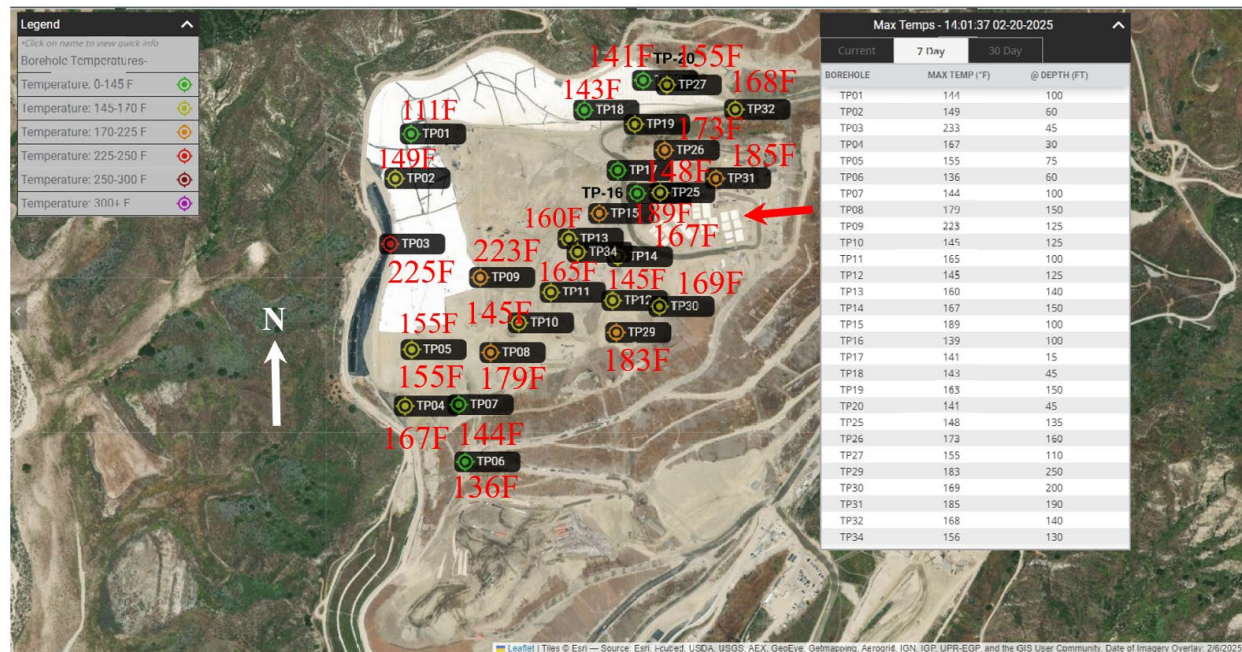


Figure 1. Temperature profiles over six weeks from 1/9/2025 to 2/19/2025 from SCS report dated February 20, 2025.

Figure 2 presents Sheet #1 from the SCS Report that presents the Waste Borehole Maximum Temperature Profiles Over 6 Weeks from January 9, 2025 to February 19, 2025.⁷ The dashed pink line represents the extent of the SET Event as determined by SCS on February 20, 2025. This extent is slightly larger than the dashed blue line, which represents the extent of the SET Event on March 27, 2024 as reported by SCS in the initial Soil Reaction Break/Barrier Plan.⁸ **Figure 2** also presents my extent of the SET Event as of February 26, 2025 (see dashed red line) based on the Waste Borehole Maximum Temperature Profiles Over 6 Weeks from January 9, 2025 to February 19, 2025.⁹ **Figure 2** shows the western slope and entire top deck of the CCL is now part of the

⁷ SCS Engineers, Solid Waste Borehole Maximum Temperature Profiles Over 6 Weeks for 1/9/2025 to 2/19/2025, Project #: 07224053.00, February 20, 2025, 31 p.

⁸ SCS Engineers, Soil Reaction Break/Barrier Plan, Chiquita Canyon Landfill, Castaic, California, South Coast AQMD Facility No. 119219, Project #: 01204123.21-13, March 27, 2024, 17 p.

⁹ SCS Engineers, Solid Waste Borehole Maximum Temperature Profiles Over 6 Weeks for 1/9/2025 to 2/19/2025, Project #: 07224053.00, February 20, 2025, 31 p.

SET Event, which is a significant increase over the extent reported by SCS on March 27, 2024¹⁰ and February 20, 2025.¹¹ Based on **Figure 2**, SCS believes the SET Event only covers about 28 acres as of February 20, 2025 whereas my extent of the SET Event covers about 90 acres.

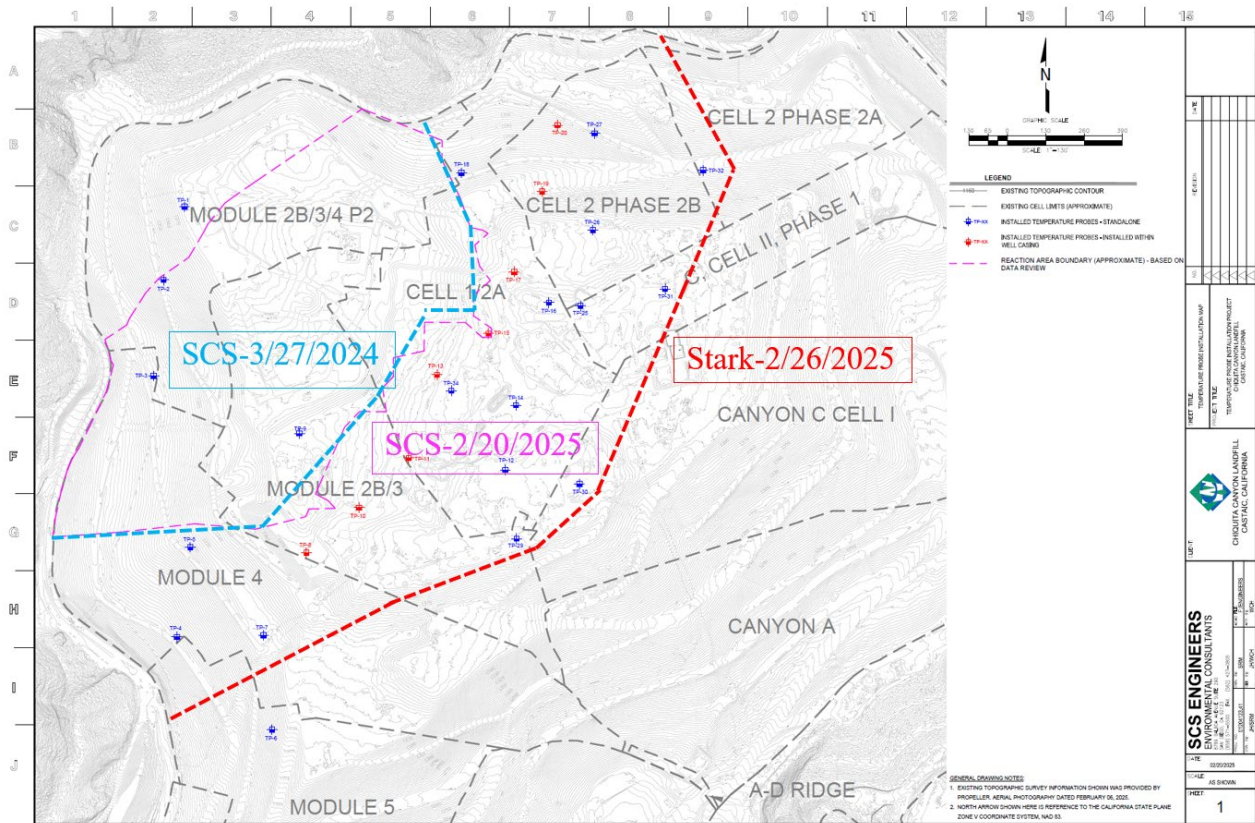


Figure 2. Extent of elevated temperatures from March 27, 2024 to February 26, 2025.

¹⁰ SCS Engineers, Soil Reaction Break/Barrier Plan, Chiquita Canyon Landfill, Castaic, California, South Coast AQMD Facility No. 119219, Project #: 01204123.21-13, March 27, 2024, 17 p.

¹¹ SCS Engineers, Solid Waste Borehole Maximum Temperature Profiles Over 6 Weeks for 1/9/2025 to 2/19/2025, Project #: 07224053.00, February 20, 2025, 31 p.

Weekly Fissures and Tension Cracks Report Dated February 17, 2025

CCL also presented their 4050 – Chiquita Reaction Area Tracking of Fissures and Tension Cracks weekly report on February 17, 2025¹². This report presents: (1) observations of new fissures and tension cracks, which are usually due to landfill settlement and/or slope instability, (2) exposed geomembrane tears and defects, and (3) other geosynthetic cover issues.

This weekly report dated February 17, 2025¹³ confirms that settlement has started to occur around the leachate tank farm, which reinforces the recommendation above that the tanks should be moved off the top deck and to a site off the CCL and on native soil. In particular, Area #148, which is just north of the tank farm (see red dot in **Figure 3**), experienced opening of significant fissures and tensions cracks that have been remediated but are likely to reappear as additional buried waste undergoes thermal breakdown. Area #154, which is located just south of the tank farm (see **Figure 3**), also recently experienced fissuring and tension crack development. Even more concerning is Area #147 experienced a significant sinkhole, which indicates a significant thermal breakdown of buried waste that resulted in a void developing below the interim soil cover. Area #147 is the next grid area north of Area #148.



Figure 3. Red dot shows location for fissures and tension cracks identified in weekly CCL report dated February 17, 2025¹⁴.

¹² Chiquita Canyon, Weekly Report - 4050 Chiquita Reaction Area Tracking of Fissures and Tension Cracks, by Nancy Bahena Hernandez, February 17, 2025, 39 p.

¹³ Chiquita Canyon, Weekly Report - 4050 Chiquita Reaction Area Tracking of Fissures and Tension Cracks, by Nancy Bahena Hernandez, February 17, 2025, 39 p.

¹⁴ Chiquita Canyon, Weekly Report - 4050 Chiquita Reaction Area Tracking of Fissures and Tension Cracks, by Nancy Bahena Hernandez, February 17, 2025, 39 p.

Figure 4 shows a tension crack in Grid #148 near the leachate tank farm on the top deck of the CCL. This photograph also reinforces the recommendation above that the tanks should be moved off the CCL. This photograph was taken during a South Coast Air Quality Management District (SCAMD), Inspection of the CCL on February 27, 2025.



Figure 4. Photograph of tension crack in Grid #148 near leachate tanks on top of CCL dated February 27, 2025¹⁵.

¹⁵ South Coast Air Quality Management District (SCAMD), Inspection Report - Chiquita Canyon Landfill, by Larry Israel, Gerardo Vergara, and Christin Ojeda, February 27, 2025, 21 p.

The weekly report dated February 17, 2025¹⁶ also discusses recent tears and defects in the exposed 30 mil thick white HDPE geomembrane cover. In particular, this weekly report presents photographs of four significant tears in the exposed geomembrane. For example, **Figure 5** presents two of these tears, which were repaired using an extrusion welded patch. Unfortunately, the location of these two tears is not identified in the weekly report dated February 17, 2025¹⁷. This indicates the 30-mil thick white HDPE geomembrane may be deteriorating in the presence of the SET Event temperatures and related activities and equipment, which is discussed below.



Photo 1



Photo 2

Figure 5. Photographs of exposed geomembrane tears identified in weekly CCL report dated February 17, 2025¹⁸.

The weekly report dated February 17, 2025¹⁹ also discusses other “Geosynthetic Cover” issues. In particular, this report presents fourteen photographs illustrating “instability under the cover”.

¹⁶ Chiquita Canyon, Weekly Report - 4050 Chiquita Reaction Area Tracking of Fissures and Tension Cracks, by Nancy Bahena Hernandez, February 17, 2025, 39 p.

¹⁷ Chiquita Canyon, Weekly Report - 4050 Chiquita Reaction Area Tracking of Fissures and Tension Cracks, by Nancy Bahena Hernandez, February 17, 2025, 39 p.

¹⁸ Chiquita Canyon, Weekly Report - 4050 Chiquita Reaction Area Tracking of Fissures and Tension Cracks, by Nancy Bahena Hernandez, February 17, 2025, 39 p.

¹⁹ Chiquita Canyon, Weekly Report - 4050 Chiquita Reaction Area Tracking of Fissures and Tension Cracks, by Nancy Bahena Hernandez, February 17, 2025, 39 p.

For example, **Figure 6** presents two of these photographs, which show settlement under the geomembrane due to thermal breakdown of the buried waste.



Photo 3



Photo 4

Figure 6. Photographs of other exposed geomembrane issues identified in weekly CCL report dated February 17, 2025²⁰.

Temporary Exposed Geomembrane Cover

Given the west side and top deck of the CCL are experiencing elevated temperature, I unfortunately think the only remedial option is to cover the entire landfill north of TP06 or north of the red and blue dashed line shown in **Figure 7**. The elevated temperatures have not manifested themselves on the eastern slope yet, but I anticipate leachate outbreaks could start occurring because elevated temperatures (183°F and 185°F as shown in **Figure 1**) are present at the crest of the eastern slope.

Currently, CCL is using a 30-mil thick high-density polyethylene (HDPE) geomembrane with a white reflective and textured surface. This geomembrane was manufactured by Solmax and shipped in 22.5 ft wide rolls from Canada to the CCL. An Ethylene Vinyl Alcohol (EVOH) geomembrane has been found to be better at containing odors and omissions during other long-term SET Events, e.g., Bridgeton Landfill. EVOH geomembranes are manufactured as a “sandwich” with the outside layers comprised of HDPE with an inner layer of semi-crystalline thermoplastic resin that resists odor and gas transmission.

Bridgeton Landfill near St. Louis has been experiencing a SET Event since 2011 and is covered with green colored 60 mil thick EVOH geomembrane. Given there is no mechanism to “isolate and contain” the CCL SET Event, I am anticipating this facility will continue to generate odors and emissions for many years to come. As a result, I recommend the CCL consider installing an

²⁰ Chiquita Canyon, Weekly Report - 4050 Chiquita Reaction Area Tracking of Fissures and Tension Cracks, by Nancy Bahena Hernandez, February 17, 2025, 39 p.

exposed EVOH geomembrane over the area to the north of the red and blue dashed line shown in **Figure 7**.

The exposed EVOH geomembrane could consist of a tan (easier to UV stabilize, reduces heat, and better matches dry surroundings) or green (less visible during wet periods) 40 or 60 mil thick EVOH textured geomembrane underlain by a minimum 6 ounce per square yard (oz/sy) nonwoven geotextile. A tan EVOH geomembrane color is recommended because there are number of tan geomembranes that have been in exposed for a number of years, so a suitable UV stabilized formulation is available.

The EVOH geomembrane should be continuously seamed and continuously tied into the existing exposed 30 mil HDPE geomembrane cover along the top deck. The EVOH geomembrane can be welded to the existing 30 mil thick HDPE exposed geomembrane because the outside layers are comprised of HDPE and thus can be welded with traditional HDPE welding equipment. As the existing 30-mil thick exposed white HDPE geomembrane deteriorates with time, it should be replaced with the selected EVOH geomembrane.

The selected EVOH geomembrane (GM) should have a life span of about 10 years due to the large amount of waste that is being impacting by the SET Event. Given the long and steep slopes, a double-sided textured EVOH GM may be required. However, to facilitate walking on the EVOH GM, the exposed side should probably be textured. The EVOH GM also should be able to withstand a temperature of about 180°F because TP15 is showing a waste temperature of 175°F at a depth of only 15 feet. Finally, the EVOH GM should exhibit a methane permeance of less than 2.5×10^{-13} m/s obtained using ASTM D1434²¹ to control benzene and other emissions.

The total area proposed for the EVOH geomembrane cover is about 100 acres, i.e., the area not covered with the 30-mil thick white HDPE geomembrane. The nonwoven geotextile underlying the EVOH geomembrane will be installed on a prepared subgrade and provide a cushion and gas and liquid transmission layer under the geomembrane. Alternatively, a geonet with two heat-bonded nonwoven geotextiles could underlie the EVOH geomembrane and provide a higher transmissivity than a geotextile.

The EVOH geomembrane could be installed by deploying the manufactured rolls across the top deck and down the sideslopes. The perimeter edge of the new EVOH geomembrane cover will either be welded to the existing 30 mil thick white HDPE geomembrane or anchored along the perimeter of the CCL. Of course, the CCL should design appropriate long-term ballasting for the existing HDPE geomembrane and the proposed EVOH geomembrane because of the long duration of other SET Events. The EVOH geomembrane should be installed by an experienced contractor

²¹ ASTM D1434-23, Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting, ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428, <https://compass.astm.org/document/?contentCode=ASTM%7CD1434-23%7Cen-US&proxycl=https%3A%2F%2Fsecure.astm.org&fromLogin=true>.

and crews in accordance with CCL project specifications and an accompanying QA/QC Plan. Given the long-term application of the EVOH geomembrane, the installation should be monitored in accordance with the QA/QC Plan by an experienced third-party engineering firm. A final certification report should be prepared under the direction of a certified engineer and be submitted to the CCL and proper local authority, e.g., Los Angeles Regional Water Quality Control.

Pipe penetrations of the HDPE and EVOH geomembrane cover should be sealed utilizing a suitable pipe boot and pipe clamp or seal. These boots can be the source of significant odor release and/or oxygen intrusion so these pipe boots and seals should be inspected and monitored regularly for vapor emissions so defects due to total and differential can be remediated quickly.

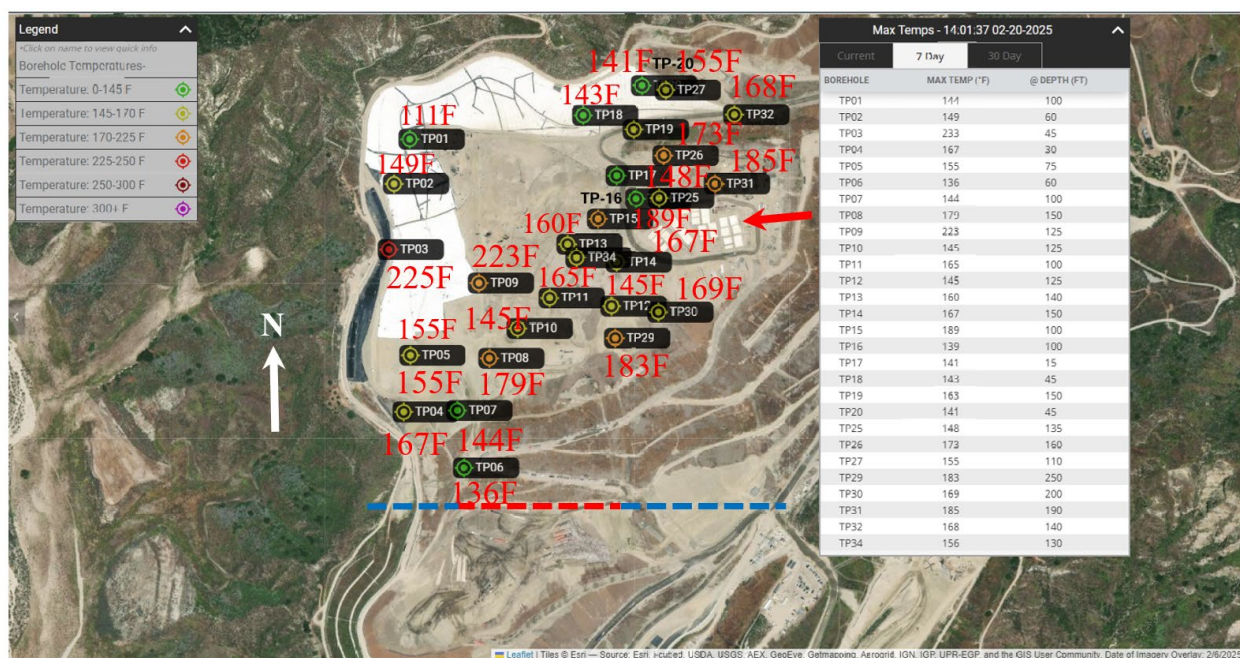


Figure 7. Extent of elevated temperatures on February 26, 2025 and location of a possible vertical barrier to isolate southernmost 13 acres.

Proposed Vertical Barrier

This section discusses installing a thermal barrier south of TP06 (see dashed red and blue line in **Figure 7**). A thermal barrier is recommended along the dashed red and blue line in **Figure 7** for at least the following reasons:

- CCL is using the approximately 13 acres south of the dashed red and blue line in **Figure 7** for disposal operations so elevated temperatures should be prevented from reaching this area, so the landfill continues to have an area to dispose of on-site wastes.
- Ensure continued ingress and egress from the CCL.
- Reduce the amount of waste that can be consumed by the SET Event and thus reduce the duration of odors and emissions to the surrounding communities.
- Maintain stability of the southern sideslope.

The red dashed line in **Figure 7** roughly delineates the location of a thermal barrier already constructed by CCL. The extent and depth of the thermal barrier are not known, so I request this information be provided by CCL. The blue dashed lines in **Figure 7** indicate the existing thermal barrier should be extended east and west so the SET Event cannot go around or under the existing thermal barrier.

If the existing thermal barrier does not extend to near below the leachate level, vertical elements can be used to create a vertical thermal barrier to prevent the SET Event from impacting the southernmost 13 acres of the CCL. The vertical elements involve excavating a vertical shaft using a three or four-foot bucket auger drill rig, which is being used to install gas extraction wells at CCL. These vertical elements would be constructed along the dashed red and blue lines in **Figure 7**. After excavating the shaft, it could be backfilled with a soil-bentonite or soil-cement mix. The shafts would be tangent, i.e., touching, or overlapped (see **Figure 7**) to create a continuous barrier across the toe of the southern sideslope to prevent the SET Event from consuming the southernmost 13 acres. If heat transfer calculations require a wider thermal barrier, a second row of vertical elements could be constructed north or south of the initial row (see **Figure 7**). The secondary row would be tangent to the initial row and be centered at each intersection of the initial row as shown below (see **Figure 7**).

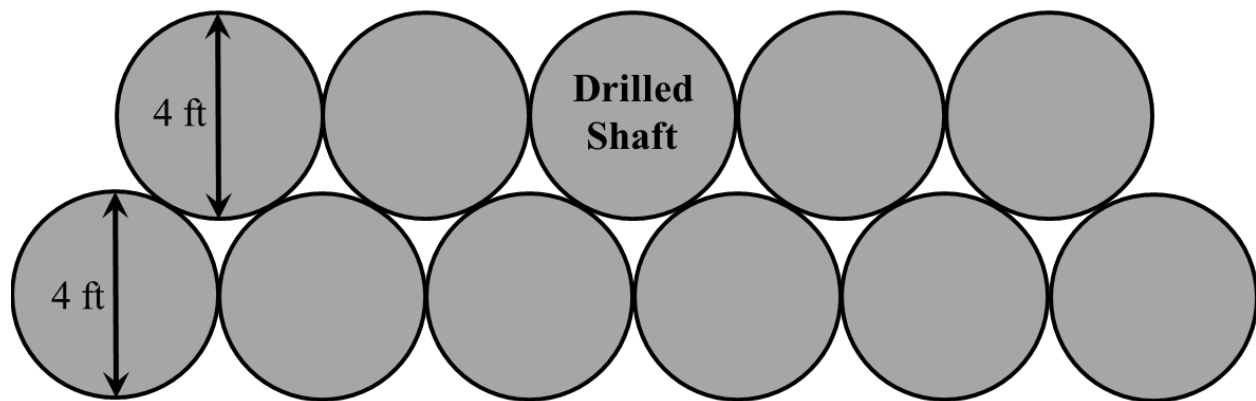


Figure 8. Possible configurations of 3 to 4 ft diameter vertical elements to comprise a heat barrier system south of TP06 to isolate southernmost 13 acres.

Summary

This section summarizes the main findings and recommendations presented in this report:

1. SET Event has expanded to the east side of the top deck of the CCL,
2. Leachate Tank Farm should be relocated off the top deck because the CCL is undergoing settlement under the tanks,
3. Due to the movement of the SET Event, the Tank Farm should be relocated to a site off the CCL and on native soil,
4. Given the extent of the SET Event, install 40 or 60 mil thick tan or green HDPE EVOH textured geomembrane underlain by a minimum 6 ounce per square yard (oz/sy) nonwoven geotextile over the approximately 100 acres currently exposed and weld it to the existing 30-mil thick white HDPE geomembrane or place it in a suitable anchor trench,
5. Submit a Request For Information (RFI) regarding the current extent and depth of the thermal barrier installed near the southern end of the CCL (see red dashed line in **Figure 7**), and
6. Expand the current thermal barrier so it reduces the potential for the SET Event to impact the southernmost 13 acres of the CCL.

EXHIBIT 7

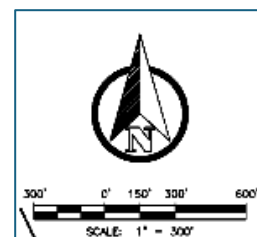
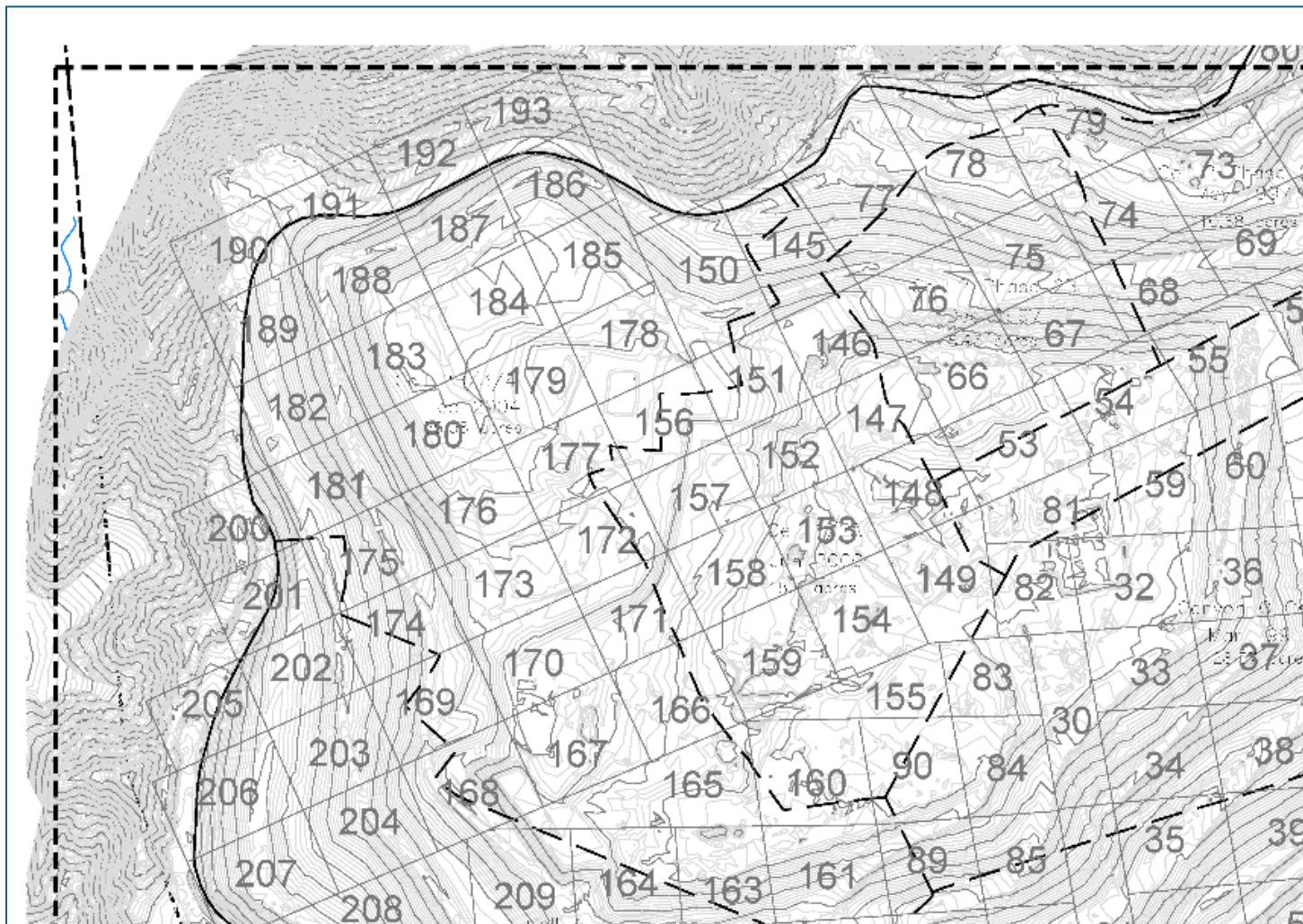


EXHIBIT 8



Yana Garcia
Secretary for
Environmental Protection



Department of Toxic Substances Control

Meredith Williams, Ph.D., Director
7575 Metropolitan Drive, Suite 108
San Diego, CA 92108



Gavin Newsom
Governor

SUMMARY OF VIOLATIONS

On December 12, 2023, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), conducted an investigation at:

Facility Name:	Chiquita Canyon, LLC		
Facility Address:	29201 Henry Mayo Drive, Castaic, CA 91384		
EPA ID Number:	CAL000347030	County:	Los Angeles

As a result of this investigation, DTSC discovered violations of the California Hazardous Waste Control Laws and its implementing regulations that are identified on the attached pages. You must correct the following violations within the schedule for compliance for each violation. If you disagree with the alleged violations listed in this Summary of Violations, you must inform DTSC in writing. If additional violations are found after this investigation, such violations, if any, will be identified in writing.

DTSC will provide you with a complete investigation report within 65 days of the date of this investigation. You may request a meeting with DTSC to discuss the investigation, investigation report, or this Summary of Violations. The issuance of this Summary of Violations does not preclude DTSC from taking administrative and/or civil action or from referring the matter for criminal prosecution as a result of the violations identified herein or violations that have not been corrected within the time specified by DTSC. Failure to comply with a schedule for compliance is a violation of the law subject to a civil penalty of up to \$70,000 for each day of noncompliance. In addition, a false statement that compliance has been achieved is a violation of the law and subject to a penalty of up to \$70,000 for each occurrence. DTSC may re-investigate this facility at any time.

Facility Representative Accepting
Summary of Violations

DTSC Representative

Name: _____
Signature: _____
Title: _____
Date: _____

Name: Erin Neal
Signature: _____
Title: Environmental Scientist
Date: 2/15/2024



Department of Toxic Substances Control
7575 Metropolitan Drive, Suite 108
San Diego, CA 92108

SUMMARY OF VIOLATIONS

Facility Name: Chiquita Canyon, LLC

Date: 2/15/2024

SECTION I: NON - MINOR VIOLATIONS AND REQUIRED CORRECTIVE ACTION (Violations not considered Minor Violations)

You must correct the following violation(s) within the specified time frame for each violation.

Violation # 1

Violation Citation:

22 CCR § 66262.11, A person who generates a waste, as defined in section 66261.2, shall determine if that waste is a hazardous waste using the following method:

- (a) the generator shall first determine if the waste is excluded from regulation under section 66261.4 or section 25143.2 of the Health and Safety Code;
- (b) the generator shall then determine if the waste is listed as a hazardous waste in articles 4 or 4.1 of chapter 11 or in Appendix X of chapter 11 of this division. If the waste is listed in Appendix X and is not listed in articles 4 or 4.1 of chapter 11, the generator may determine that the waste from his particular facility or operation is not a hazardous waste by either:
 - (1) testing the waste according to the methods set forth in article 3 of chapter 11 of this division, or according to an equivalent method approved by the Department pursuant to section 66260.21; or
 - (2) applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used and the characteristics set forth in article 3 of chapter 11 of this division.

Description:

On and/or before December 27, 2023, Chiquita Canyon, LLC (owned by and a subsidiary of Waste Connections, Inc.) failed to make a proper waste determination on waste leachate. Chiquita Canyon, LLC sent 4,600 gallons of hazardous waste leachate from its landfill at 29201 Henry Mayo Drive, Castaic, CA 91384, to Radford Alexander Corp. DBA Avalon (Avalon) located at 14700 S. Avalon Boulevard, Gardena, CA 90248 on non-hazardous waste manifest #NH004695, for treatment and disposal. Avalon collected split samples from the tanker truck carrying this leachate from Chiquita



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Canyon Landfill. One sample was provided to the Los Angeles County Fire Department, Health Hazardous Materials Division (County of Los Angeles Certified Unified Program Agency) and the other was kept by Avalon for analysis. DTSC Environmental Scientist Erin Neal and Supervising Environmental Scientist Zana Zmily were present during sampling of the tanker trunk. Chiquita Canyon, LLC obtained the sample lab results from the Avalon samples and then sent lab results of Avalon's leachate split sample to DTSC on January 17, 2024. These results show that the leachate sampled from the truck was in exceedance for benzene, reporting 0.538 mg/L. This is above the Toxicity Characteristic Leaching Procedure (TCLP) regulatory limit for benzene of 0.5 mg/L.

Violation Classification:

This is a class 1 violation.

Compliance Requirement:

On February 9, 2024 and February 14, 2024, Chiquita Canyon, LLC informed DTSC that they have hired a third-party consultant to assist with sampling, analyses, and characterization of the waste leachate. Chiquita Canyon, LLC shall ensure that hazardous waste leachate is properly characterized. Within 30 days of this Summary of Violations, Chiquita Canyon, LLC shall provide a written plan for making a proper waste determination for waste leachate.

Violation # 2

Violation Citation:

HSC 25189.2(c), A person who disposes, or causes the disposal of, a hazardous or extremely hazardous waste at a point that is not authorized according to the provisions of this chapter is liable for a civil penalty of not more than seventy thousand dollars (\$70,000) for each violation and may be ordered to disclose the fact of this violation or these violations to those persons as the court or, in the case of an administrative action, a hearing officer, may direct. Each day on which the deposit remains is a separate additional violation, unless the person immediately files a report of the deposit with the department and is complying with an order concerning the deposit issued by the department, a hearing officer, or a court of competent jurisdiction for the cleanup.

Description:

On and/or before December 27, 2023 Chiquita Canyon, LLC disposed and/or caused the disposal of 4,600 gallons of hazardous waste leachate by sending this leachate to Avalon at 14700 S. Avalon Boulevard, Gardena, CA 90248 on non-hazardous waste manifest #NH004695. Avalon is not permitted by DTSC as a treatment, storage, and disposal facility for hazardous waste. As discussed in violation 1, the leachate sampled from the truck was in exceedance for benzene, reporting 0.538 mg/L. This is above the TCLP regulatory limit for benzene of 0.5 mg/L.



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Violation Classification:

This is a class 1 violation.

Compliance Requirement:

Chiquita Canyon, LLC shall immediately stop disposing of hazardous waste leachate at Avalon and any other point that is not authorized. Within 30 days of this Summary of Violations, Chiquita Canyon, LLC shall provide a written explanation of how hazardous waste leachate will be disposed.

Violation # 3

Violation Citation:

HSC 25189.2(d), A person who treats or stores, or causes the treatment or storage of, a hazardous waste at a point that is not authorized according to this chapter, shall be liable for a civil penalty not to exceed seventy thousand dollars (\$70,000) for each separate violation or, for continuing violations, for each day that the violation continues.

Description:

On and/or before December 27, 2023 Chiquita Canyon, LLC caused the storage and treatment of 4,600 gallons of hazardous waste leachate by Avalon at 14700 S. Avalon Boulevard, Gardena, CA 90248. 4,600 gallons of waste leachate was sent on non-hazardous waste manifest #NH004695 to Avalon for treatment and disposal. Avalon confirmed that this load was processed at their facility. Avalon is a wastewater treatment facility that has been accepting waste leachate from Chiquita Canyon Landfill. Leachate is treated through Avalon's organic Subcategory C wastewater treatment process, which includes filtration and granular activated carbon adsorption. Once treated, this wastewater is discharged to the Los Angeles County sewer. Avalon is not permitted by DTSC as a treatment, storage, and disposal facility for hazardous waste. Avalon does not have a hazardous waste treatment permit with the local CUPA.

As discussed in violation 1, the leachate sampled from the truck was in exceedance for benzene, reporting 0.538 mg/L. This is above the TCLP regulatory limit for benzene of 0.5 mg/L.

Violation Classification:

This is a class 1 violation.

Compliance Requirement:

Chiquita Canyon, LLC shall immediately stop causing the storage and treatment of hazardous waste leachate at Avalon and any other point that is not authorized.



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Violation # 4

Violation Citation:

22 CCR § 66262.20(a), A generator who transports, or offers for transport a hazardous waste for offsite treatment, storage, or disposal, or a treatment, storage, or disposal facility that offers for transport a rejected hazardous waste load, shall prepare a Manifest (OMB Control number 2050-0039), EPA Form 8700-22, and, if necessary, EPA Form 8700-22A before the waste is transported off-site.

Description:

On and/or before December 27, 2023 Chiquita Canyon, LLC offered for transport hazardous waste for off-site treatment, storage, and disposal, and failed to prepare a hazardous waste manifest for 4,600 gallons of hazardous waste leachate. Chiquita Canyon, LLC sent the waste leachate to Avalon at 14700 S. Avalon Boulevard, Gardena, CA 90248 on non-hazardous waste manifest #NH004695.

As discussed in violation 1, the leachate sampled from the truck was in exceedance for benzene, reporting 0.538 mg/L. This is above the TCLP regulatory limit for benzene of 0.5 mg/L.

Violation Classification:

This is a class 1 violation.

Compliance Requirement:

Chiquita Canyon, LLC shall immediately stop using non-hazardous waste manifests for transportation and disposal of hazardous waste leachate. Chiquita Canyon, LLC shall prepare and use hazardous waste manifests for waste leachate that is deemed to be hazardous waste.

Violation # 5

Violation Citation:

22 CCR § 66265.31, Facilities shall be maintained and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.

Description:

On and/or before December 12, 2023, Chiquita Canyon, LLC failed to minimize the possibility of releases of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.



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On December 12, 2023, DTSC personnel observed leachate pooling on the scrim liner on the northwest side of the facility and also observed well CV-2201 actively leaking. In addition, DTSC personnel observed staining on the ground surrounding wells CV-2203 and CV-2338. DTSC personnel collected samples from well heads CV-2203 and CV-2338 and provide split samples to Chiquita Canyon, LLC. The DTSC sample (CCL-6B) collected from CV-2203 was in exceedance for TCLP benzene, reporting 0.912 mg/L. Chiquita Canyon, LLC also ran TCLP analysis on the split sample provided by DTSC from well CV-2203, which was also in exceedance for TCLP benzene, reporting 2.9 mg/L. The DTSC sample (CCL-8B) collected from CV-2338 reported a benzene concentration of 0.196 mg/L, below the TCLP regulatory limit for benzene of 0.5 mg/L. Chiquita Canyon, LLC also ran TCLP analysis on the split sample provided by DTSC from well CV-2338, which was in exceedance for benzene, reporting 0.59 mg/L.

On January 16, 2024, during a South Coast Air Quality Management District (SCAQMD) Hearing Board public hearing (South Coast AQMD vs. Chiquita Canyon LLC, Case #6177-4), "Petitioner's Exhibit 18" showed a video of a leachate geyser that took place at one of the wells. This geyser was observed and recorded during a joint inspection conducted by the US EPA and SCAQMD on November 8, 2023. This well appeared to be the same well that was later sampled by DTSC on December 12, 2023 and had exceeded the regulatory limit for benzene of 0.5 mg/L.

On February 7, 2024, Roux Associates, Inc., contracted by the Los Angeles County Department of Public Health, issued a report titled, "Community Air Sampling and Health Risk Screening Evaluation Report: Val Verde and Castaic Communities Los Angeles County, California" which assessed potential health risks for the communities surrounding the Chiquita Canyon Landfill. The report states that "[o]n some days, benzene concentrations measured in Community air appear to be incrementally greater than what was observed on the same day in background locations." The report also states that "[d]ays where the Community benzene air concentrations are observed to significantly exceed background benzene air concentrations may represent an incremental contribution of benzene resulting from Chiquita landfill gas emissions."

On November 2, 2023, DTSC personnel observed leachate actively seeping out on the northwest side of the facility. DTSC air monitoring equipment detected volatile organic compound readings between 0 and 5 ppm near this seep.

Violation Classification:

This is a class 1 violation.

Compliance Requirement:

Chiquita Canyon, LLC shall maintain and operate its facility in a manner that minimizes the possibility of any unplanned sudden or non-sudden releases of hazardous waste or



Department of Toxic Substances Control
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hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment. Within 30 days of this Summary of Violations, Chiquita Canyon, LLC shall provide a written explanation of how the facility will minimize the possibility of any unplanned sudden or non-sudden releases of hazardous waste or hazardous waste constituents. Chiquita Canyon, LLC shall also document and report all releases of hazardous waste to DTSC.

SECTION III: OTHER ISSUES/CONCERNS

The following issues/concerns were identified during this investigation. Further research may identify additional violations. Any new violations, with the prescribed corrective action and schedule for compliance, will be identified in the Violation section of the investigation report.

-
1. The Los Angeles County Fire Department also ran lab analyses on the split sample collected from the tanker truck at Avalon on December 27, 2023. The lab report for the TCLP analysis states that the sample was received by the lab outside of holding time and the sample was prepared outside of the preparation holding time.
 2. On January 25, 2024, Chiquita Canyon, LLC responded to an information request by DTSC. On January 31, 2024, DTSC requested additional information and received this information on February 12, 2024. DTSC received an additional letter from Chiquita Canyon, LLC on February 15, 2024. The information and the letters provided by Chiquita Canyon, LLC are currently under review.



Yana Garcia
Secretary for
Environmental Protection



Department of Toxic Substances Control

Meredith Williams, Ph.D., Director
7575 Metropolitan Drive, Suite 108
San Diego, CA 92108



Gavin Newsom
Governor

SUMMARY OF VIOLATIONS

On December 12, 2023, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), began an investigation at:

Facility Name:	Chiquita Canyon, LLC		
Facility Address:	29201 Henry Mayo Drive, Castaic, CA 91384		
EPA ID Number:	CAL000347030	County:	Los Angeles

As a result of this continued investigation, DTSC discovered violations of the California Hazardous Waste Control Law and its implementing regulations that are identified on the attached pages. You must correct the following violations within the schedule for compliance for each violation. If you disagree with the alleged violations listed in this Summary of Violations, you must inform DTSC in writing. If additional violations are found after this investigation, such violations, if any, will be identified in writing.

DTSC will provide you with a complete investigation report within 65 days of the date of this investigation. You may request a meeting with DTSC to discuss the investigation, investigation report, or this Summary of Violations. The issuance of this Summary of Violations does not preclude DTSC from taking administrative and/or civil action or from referring the matter for criminal prosecution as a result of the violations identified herein or violations that have not been corrected within the time specified by DTSC. Failure to comply with a schedule for compliance is a violation of the law subject to a civil penalty of up to \$70,000 for each day of noncompliance. In addition, a false statement that compliance has been achieved is a violation of the law and subject to a penalty of up to \$70,000 for each occurrence. DTSC may re-investigate this facility at any time.

Facility Representative Accepting
Summary of Violations

Name: Steve Cassulo

Signature: Original Signed by Steve Cassulo

Title: District Manager

Date: 4/1/2024

DTSC Representative

Name: Erin Neal

Signature: Original Signed by Erin Neal

Title: Environmental Scientist

Date: 3/29/2024



Department of Toxic Substances Control
7575 Metropolitan Drive, Suite 108
San Diego, CA 92108

SUMMARY OF VIOLATIONS

Facility Name: Chiquita Canyon, LLC Date: 3/29/2024

SECTION I: NON - MINOR VIOLATIONS AND REQUIRED CORRECTIVE ACTION (Violations not considered Minor Violations)

You must correct the following violation(s) within the specified time frame for each violation.

Violation # 1

Violation Citations:

California Code of Regulations, title 22 (22 CCR) § 66265.31, Facilities shall be maintained and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.

Description:

On and/or before March 11, 2024, Chiquita Canyon, LLC failed to minimize the possibility of releases of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.

On February 14, 2024, Chiquita Canyon, LLC memorialized in a letter to DTSC the need for the use of the immediate response exemption pursuant to 22 CCR § 66264.1(g)(8)(A)(2), 66265.1(e)(11)(A)(2), and 66270.1(c)(3)(A)(2). Chiquita Canyon, LLC stated:

“[T]here is an imminent and substantial threat that such potential hazardous wastes could be discharged into the environment. ... [D]ue to the space constraints and limitations in accumulation capacity, Chiquita has temporarily shut off pumps to reduce the amount of liquids that are extracted from the reaction. This does not mean that liquid is not being produced by the reaction; it means that liquid is continuing to accumulate inside of the waste mass. The liquid must go somewhere.”

On March 5, 2024, DTSC issued an information request to Chiquita Canyon, LLC for all leachate manifests since January 1, 2024. Chiquita Canyon, LLC provided DTSC with hazardous waste manifests on March 12, 2024. According to the records provided by Chiquita Canyon, LLC, no leachate was manifested for hazardous waste disposal from 2/14/2024 to 2/25/2024, 3/2/2024 to 3/3/2024, 3/5/2024 to 3/7/2024, and 3/10/2024 to



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3/11/2024. As a result, Chiquita Canyon, LLC did not utilize all resources to demonstrate an immediate response to minimize the possibility of releases of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment. Chiquita Canyon, LLC failed to utilize all permitted hazardous waste treatment, storage, and disposal facilities (TSDFs) for off-site shipments of hazardous waste leachate.

Violation Classification:

This is a class 1 violation.

Compliance Requirement:

Chiquita Canyon, LLC shall utilize all potential hazardous waste disposal options to the fullest extent to minimize the possibility of any unplanned sudden or non-sudden releases of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment. Within **three** days of this Summary of Violations, Chiquita Canyon, LLC shall provide a written list of all potential permitted hazardous waste disposal facilities where leachate can be disposed, including the daily maximum quantities allowed and Chiquita **must** send daily shipments of hazardous waste leachate at the maximum allowable quantities to the identified offsite disposal locations. At the end of each and every day (by 11:59 PM), Chiquita shall provide copies of hazardous waste manifests to DTSC for all shipments of hazardous waste leachate sent off-site that day.

Violation # 2

Violation Citations:

Health and Safety Code (HSC) § 25189.2(c), A person who disposes, or causes the disposal of, a hazardous or extremely hazardous waste at a point that is not authorized according to the provisions of this chapter is liable for a civil penalty of not more than seventy thousand dollars (\$70,000) for each violation and may be ordered to disclose the fact of this violation or these violations to those persons as the court or, in the case of an administrative action, a hearing officer, may direct. Each day on which the deposit remains is a separate additional violation, unless the person immediately files a report of the deposit with the department and is complying with an order concerning the deposit issued by the department, a hearing officer, or a court of competent jurisdiction for the cleanup.

Description:

On and/or before February 21, 2024, Chiquita Canyon, LLC disposed and/or caused the disposal of two truckloads, approximately 10,000 gallons total, of hazardous waste leachate by sending this leachate to Patriot Environmental Services (Patriot) at 314 W. Freedom Avenue, Orange, CA 92865 on non-hazardous manifest #9229 and #9133. The leachate was pulled from Tank #45 at Chiquita Canyon Landfill, which was sampled on February 18, 2024, indicating that the tank contained benzene at 0.6 mg/L, above the Toxicity Characteristic Leaching Procedure (TCLP) regulatory threshold of 0.5 mg/L



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for benzene. Approximately 18 hours after treatment, on February 20th, post-treatment sampling was conducted on Tank #45. Sampling results from Chiquita Canyon, LLC showed that the tank contained benzene at 0.5 mg/L, at the TCLP regulatory threshold for benzene. Samples were also collected of waste leachate remaining in Tank #45 after most of the waste was already received and processed by Patriot. This sample had 0.6 mg/L benzene.

Chiquita Canyon, LLC sent a letter to Patriot regarding these exceedances on February 26, 2024. Chiquita Canyon, LLC stated in its letter that it recognized that this leachate was released into Patriot's treatment process.

Violation Classification:

This is a class 1 violation.

Compliance Requirement:

Chiquita Canyon, LLC shall immediately take steps to ensure that hazardous waste leachate is not disposed of at a point that is not authorized. Within 15 days of this Summary of Violations, Chiquita Canyon, LLC shall provide a written explanation of how the facility will ensure that hazardous waste leachate is not disposed of at unauthorized locations.

Violation # 3

Violation Citations:

HSC § 25189.2(c), A person who disposes, or causes the disposal of, a hazardous or extremely hazardous waste at a point that is not authorized according to the provisions of this chapter is liable for a civil penalty of not more than seventy thousand dollars (\$70,000) for each violation and may be ordered to disclose the fact of this violation or these violations to those persons as the court or, in the case of an administrative action, a hearing officer, may direct. Each day on which the deposit remains is a separate additional violation, unless the person immediately files a report of the deposit with the department and is complying with an order concerning the deposit issued by the department, a hearing officer, or a court of competent jurisdiction for the cleanup.

Description:

On and/or before February 23, 2024, Chiquita Canyon, LLC disposed and/or caused the disposal of hazardous waste leachate due to a release onto the soil caused by a ruptured hose associated with the leachate treatment and storage tank, Tank #47, during treatment processes occurring at 29201 Henry Mayo Drive, Castaic, CA 91384. Tank #47 was sampled on February 21, 2024 by the facility and was found to have an exceedance for benzene, reporting 0.8 mg/L. This is above the TCLP regulatory limit for benzene of 0.5 mg/L. At the time of the release the tank was undergoing re-treatment and in addition to the hazardous waste leachate contained iron chelate and/or peroxide from the treatment process. The hazardous waste leachate and treatment mixture that was released came into contact with an employee of Chiquita Canyon, LLC. Per



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CalOES Spill Control #24-1157, that employee was injured by the release and transported to a local hospital.

Violation Classification:

This is a class 1 violation.

Compliance Requirement:

Chiquita Canyon, LLC shall immediately take steps to ensure that hazardous waste leachate is not released or disposed of at a point that is not authorized and remains safely contained. Within 15 days of this Summary of Violations, Chiquita Canyon, LLC shall provide a written explanation of how the facility will ensure that no release or disposal occurs.

SECTION II: OTHER ISSUES/CONCERNS

The following issues/concerns were identified during this investigation. Further research may identify additional violations. Any new violations, with the prescribed corrective action and schedule for compliance, will be identified in the Violation section of the investigation report.

1. The facility is generating RCRA hazardous waste and thus should have a federal EPA ID number. Please provide us with that number or obtain one if you have not already.

EXHIBIT 9

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IX

)	
IN THE MATTER OF:)	
)	
Chiquita Canyon, LLC)	
	)	UNILATERAL ADMINISTRATIVE
	)	ORDER
)	
RESPONDENT	)	EPA DOCKET NO.
	)	RCRA 7003-09-2024-0001 and
Proceeding under Section 7003 of the	)	CERCLA 106-09-2024-05
Resource Conservation and Recovery Act,)	
as amended, 42 U.S.C. Section 6900, et seq.,)	
and Section 106(a) of the Comprehensive)	
Environmental Response, Compensation,)	
and Liability Act, 42 U.S.C. Section 9601)	
et seq.)	
)	

I. INTRODUCTION

1. This Unilateral Administrative Order (“UAO”) is issued by the United States Environmental Protection Agency, Region IX (“EPA”) to Chiquita Canyon, LLC, dba Chiquita Canyon Landfill (“CCL” or “Respondent”). This UAO provides for the performance of response actions to address off-Site impacts and ongoing subsurface reactions causing off-Site impacts, including any additional work that maybe required by Section XXIV (Additional Work) of this UAO, by Respondent in connection with the property located at 29201 Henry May Drive in Castaic, California (the “Site”). In issuing this UAO, EPA intends for Respondent to identify, investigate, remedy, and/or prevent the potential endangerment to human health or the environment from activities involving solid and hazardous waste, and to ensure that the Work ordered by EPA is designed and implemented to protect human health or the environment. Respondent shall finance and perform the Work in accordance with this UAO, plans, standards, specifications and schedules set forth in this UAO or developed by Respondent and approved by EPA pursuant to this UAO.
2. EPA has determined that Respondent has contributed or is contributing to the past or present handling, storage, treatment, transportation or disposal of solid and hazardous waste that may present an imminent and substantial endangerment to health or the environment.
3. EPA has notified the State of California of this action pursuant to the Resource Conservation and Recovery Act (also known as the Solid Waste Disposal Act), as amended, 42 U.S.C. §§ 6901, *et seq.* (RCRA), Section 7003(a), 42 U.S.C. § 6973(a), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, *et seq.* (CERCLA), Section 106(a), 42 U.S.C. § 9606(a).

II. JURISDICTION

4. This UAO is issued under the authority vested in the Administrator of EPA by Section 7003 of RCRA, 42 U.S.C. § 6973, which authority has been delegated to the Regional Administrators of EPA by Delegation 8-22 (January 18, 2017), and redelegated to the Director of the Enforcement and Compliance Assurance Division of EPA Region IX by Delegation R9 8-22 (March 8, 2017). This UAO is also issued under the authority vested in the President of the United States by Section 106(a) of CERCLA, 42 U.S.C. § 9606(a), which authority has been delegated to the Administrator of the EPA by Executive Order No. 12580, 52 Fed. Reg. 2923 (Jan. 23, 1987), further delegated to the Regional Administrators of EPA by Delegations 14-14A (January 31, 2017) and 14-14B (January 18, 2017), and redelegated to the Director of the Superfund and Emergency Management Division of EPA Region IX by Delegation R9 14-14A and 14-14B (May 9, 2018 and May 1, 2019).

III. PARTIES BOUND

5. This UAO shall apply to and be binding on Respondent and Respondent's officers, directors, employees, agents, successors, assigns, heirs, trustees, receivers, and on all persons, including, but not limited to, contractors and consultants, acting on behalf of Respondent, as well as on subsequent purchasers of the Site. Any change in the ownership or corporate status of Respondent, including, but not limited to, any transfer of assets or real or personal property, shall not alter Respondent's responsibilities under this UAO.
6. Respondent shall provide a copy of this UAO to any subsequent owners or successors before a controlling interest in ownership rights, stock, assets or the Site is transferred. Respondent shall be responsible for, and liable for, completing all of the activities required pursuant to this UAO, regardless of whether there has been a transfer of ownership or control of the Site or whether said activities are to be performed by employees, agents, contractors, subcontractors, laboratories, or consultants of Respondent. Respondent shall provide a copy of this UAO within seven (7) days of the Effective Date, or the date that such services are retained, to all contractors, subcontractors, laboratories, and consultants that are retained to conduct or monitor any portion of the Work performed pursuant to this UAO. Respondent shall condition all contracts or agreements with contractors, subcontractors, laboratories or consultants in connection with this UAO, on compliance with the terms of this UAO. Respondent shall ensure that their respective contractors, subcontractors, laboratories, and consultants comply with this UAO.
7. Not later than sixty (60) days prior to any voluntary transfer by Respondent of any interest in the Site or the operation of the facility, Respondent shall notify EPA of the proposed transfer. In the case of a voluntary transfer through a bankruptcy, Respondent shall notify EPA within twenty-four (24) hours of the decision to transfer property. Respondent shall notify EPA of any involuntary transfers immediately on Respondent's initial receipt of notice of any involuntary transfer. Not later than three (3) days after any transfer, Respondent shall submit copies of the transfer documents to EPA.

IV. DEFINITIONS

8. Unless otherwise expressly provided herein, terms used in this UAO that are defined in RCRA or CERCLA shall have the meaning assigned to them in the applicable statute. Whenever the terms listed below are used in this UAO the following definitions apply:

"CalRecycle" shall mean California's Department of Resources Recycling and Recovery.

"CCR" means the California Code of Regulations.

“CERCLA” shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, *et seq.*

“Clean Air Act” shall mean the Clean Air Act, as amended, 42 U.S.C. §§ 7401, *et seq.*

“Day” or “day” shall mean a calendar day unless expressly stated otherwise. In computing any period of time under this UAO, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period shall run until the close of business on the next working day.

“DTSC” shall mean California’s Department of Toxic Substances Control.

“Effective Date” shall be the effective date of this UAO pursuant to Section XXVII (Effective Date).

“EPA” shall mean the United States Environmental Protection Agency and its successor departments, agencies, or instrumentalities.

“LEA” shall mean the Los Angeles County Department of Public Health, Solid Waste Management Program, certified to act as the Local Enforcement Agency by CalRecycle.

“NCP” shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

“Paragraph” shall mean a portion of this UAO identified by an Arabic numeral or an upper or lower case letter.

“Parties” shall mean EPA and Respondent.

“RCRA” shall mean the Resource Conservation and Recovery Act (also known as the Solid Waste Disposal Act), as amended, 42 U.S.C. §§ 6901, *et seq.*

“Regulatory Agencies” shall mean EPA, LEA, CalRecycle, California’s South Coast Air Quality Management District, Los Angeles Regional Water Quality Control Board, DTSC, and any successor departments or agencies of these entities.

“Respondent” shall mean Chiquita Canyon, LLC.

“RWQCB” shall mean the Los Angeles Regional Water Quality Control Board.

“Section” shall mean a portion of this UAO identified by a Roman numeral.

“Site” shall mean the facility located at 29201 Henry May Drive, in Castaic,

California (91384).

“South Coast AQMD” shall mean California’s South Coast Air Quality Management District.

“State” shall mean the State of California.

“United States” shall mean the United States of America and each department, agency, and instrumentality of the United States, including EPA.

“Waste Material” shall mean (a) any “hazardous substance” under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (b) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (c) any “solid waste” under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and (d) any “hazardous waste” under California Health & Safety Code, Division 20, Chapter 6.5 (Hazardous Waste Control Law), Section 25117 and Title 22 of the California Code of Regulations (22 CCR), Section 66261.3.

“Work” shall mean all the activities and requirements Respondent is required to perform under this UAO, except those required by Section XVI (Record Retention).

“Work Plan(s)” shall mean the Master Work Plan and/or the work plans incorporated therein.

V. FINDINGS OF FACT

9. Operation of the Landfill.

- a. CCL is registered as a limited liability company in the State of Delaware. CCL is a subsidiary of Waste Connections US, Inc., which is registered as a corporation in the State of Delaware. Waste Connections US, Inc. is a subsidiary of Waste Connections, Inc., which is registered as a business corporation in Ontario, Canada.
- b. CCL operates a Class III non-hazardous municipal solid waste landfill (“Landfill”) located on the Site in the northern portion of the County of Los Angeles. The County of Los Angeles Department of Regional Planning regulates the Landfill under a conditional use permit. The 639-acre Landfill property was first approved for waste disposal in 1967. It has been in use as a landfill since 1972. The property has continued to be used and operated as a landfill under a series of conditional use permits issued by the County of Los Angeles. CCL was most recently granted a renewed conditional use permit in 2017 (as renewed and/or amended from time to time, “CUP”) to allow continued operations and expansion of the Landfill.

- c. CCL is permitted to accept non-hazardous solid waste for disposal, including municipal solid waste, green waste for composting or recycling, construction and demolition debris, and e-waste for recycling. CCL is prohibited from accepting hazardous waste that is ignitable, corrosive, reactive, or toxic. CCL is also prohibited from accepting biohazardous waste, household hazardous waste, radioactive materials, incinerator ash, sludge, automobile shredder waste, and liquid waste.
- d. Per the CUP, CCL is permitted to dispose of up to 12,000 tons of municipal solid waste per day at the Landfill. Under a Solid Waste Facility Permit issued on October 19, 2018, by the LEA with CalRecycle's concurrence, non-hazardous mixed organics material for composting shall not exceed 560 tons per day and any combination of non-hazardous waste, beneficial reuse material and composting green material shall not exceed 12,000 tons per day or 60,000 tons per week. The CUP permits disposal of a maximum of 2,800,000 tons of municipal solid waste per year through December 2024, at which time the Landfill's maximum annual capacity will reduce to 1,800,000 tons. The average daily tonnage of municipal solid waste disposed in the Landfill in 2021 was reported to be 6,412 tons.
- e. At the Landfill, CCL operates a landfill gas collection and control system that includes vertical and horizontal gas collection wells and associated piping and trenches, multiple collection headers and blowers for venting landfill gas, a landfill gas treatment system, a condensate/leachate collection and storage system and flares that combust landfill gas. South Coast AQMD has issued permits for CCL's operation pursuant to South Coast AQMD Rules 201, 203, 1150.1, and 3002, including permits for CCL's landfill gas collection system, landfill gas treatment system, landfill gas condensate/leachate collection and storage system, two (2) portable diesel engines driving tippers, nine (9) portable diesel engines driving fans, and the landfill gas flare systems. South Coast AQMD permits also require CCL to comply with the federal rules and regulations, including the National Emissions Standards for Hazardous Air Pollutants at 40 C.F.R. Part 63, Subpart AAAA, the New Source Performance Standards at 40 C.F.R. Part 60, Subpart XXX and the Clean Air Act Title V permitting program. The Title V permitting program is a comprehensive stationary source operating permit program that implements Title V of the federal Clean Air Act by issuance of operating permits pursuant to 40 C.F.R. Parts 70 and 71.

10. Reaction Event and Effects.

- a. In May 2022, conditions at the Landfill began deteriorating in an area approximately thirty (30) acres in size, located in the north-western portion of the Landfill (the "Reaction Area"). See Attachment A, Map of Landfill.

- b. Based on CalRecycle’s review of the Landfill data, the Landfill sustained the following conditions from around May 2022 through mid-October 2023:¹
- (1) Landfill cover integrity issues;
 - (2) Increased temperatures and pressures in the landfill gas control systems and waste mass;
 - (3) Oxygen intrusion above 5% by volume;
 - (4) Landfill gas temperatures over 170°F;
 - (5) Landfill subsurface temperatures over 195°F;
 - (6) Decreased methane production;
 - (7) Elevated carbon monoxide concentrations exceeding 1000 parts per million volume;
 - (8) Unusual landfill settlement;
 - (9) Damaged gas wells;
 - (10) Poor gas well performance in and around the Reaction Area; and
 - (11) The heating/smoldering event expanding in size and intensity.
- c. On October 16, 2023, CalRecycle concluded, “The conditions at the [L]andfill are causing additional gas pressure, noxious odors, elevated well and leachate temperatures, and damage to the gas extraction system at the [L]andfill.”²
- d. EPA also confirmed from its review of the Landfill data provided by CCL on January 26, 2024, in response to EPA’s December 28, 2023, request for information, that the Landfill has sustained the following conditions:
- (1) Landfill gas collection system well temperatures above 145°F at multiple wells, from January 2022 through December 2023, and likely ongoing; and
 - (2) Increased leachate production at the Site from 151,187 gallons per week in January 2022 to 1,014,532 gallons per week in December 2023.

¹ Letter from CalRecycle to LEA, dated October 16, 2023, regarding Review of the Odor Incident at Chiquita Canyon Landfill (19-AA-0052) (the “CalRecycle October 2023 Letter.”)

² CalRecycle October 2023 Letter at 17.

- e. During on-Site visits on November 2, 2023, November 8, 2023, January 9, 2024, and January 18, 2024, EPA observed the following ongoing conditions at the Landfill:
- (1) Sour odors throughout the Reaction Area;
 - (2) Settlement of the Landfill surface about twenty (20) to thirty (30) feet below the previous grade;
 - (3) Leachate flowing out of the base of the Landfill on the northwestern side of the Reaction Area;
 - (4) Leachate bubbling out of the surface of the Landfill on the northern base of the Landfill next to the perimeter road;
 - (5) Leachate seeping out of the northside of the Landfill at a different location;
 - (6) Repairs to a Landfill well system to prevent imminent failure of the well and pressurized leachate condensate and steam ejecting from the well during such repairs;
 - (7) Cover integrity issues creating areas of exposed trash and exceedances measured during surface emissions monitoring;
 - (8) Standing liquid, appearing dark and with small, discrete bubbling, ponding above the scrim on the French drain; and
 - (9) Landfill gas pockets, or ballooning, and gas bubbles occurring underneath and above the scrim, respectively.
- f. During on-Site monitoring on November 8, 2023, and January 9, 2024, EPA conducted surface emissions monitoring s under EPA Method 21, “Determination of Volatile Organic Compound Leaks” (2017), using hydrocarbon detection instruments to measure methane as a surrogate for hazardous air pollutants to evaluate compliance with the National Emissions Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills, § 63.1958, which requires operators of municipal solid waste landfills to operate a gas collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. The surface emissions monitoring detected exceedances of the limit of 500 parts per million of methane under 40 C.F.R. § 63.1958, both inside and outside the Reaction Area, including:

- (1) Surface emissions concentrations of methane in excess of 500 parts per million at thirteen (13) out of thirty (30) wells sampled in the Reaction Area; and
 - (2) Surface emissions concentrations of methane in excess of 500 parts per million at fifty (50) unique locations on the Landfill, both inside and outside the Reaction Area.
- g. As of January 17, 2024, the Reaction Area was located approximately 1,000 feet from the nearest resident.

11. Complaints, Violations and Endangerment Due to Noxious Odors.

- a. In the spring of 2023, CCL experienced a significant increase in the number of odor complaints it received in connection with the Landfill. In 2023, South Coast AQMD received almost 6,800 complaints of odors from the public, particularly members of the public located in the communities of Val Verde, Hasley Canyon, Hillcrest, Williams Ranch, North Bluffs, Hasley Hills and Live Oak, in California, with numerous complaints alleging CCL as the source.³ The complaints describe various odors but primarily describe landfill gas and other non-trash odors.
- b. A majority of the complaints were received from individuals reporting from the community of Val Verde, which lies northwest and immediately adjacent to the Landfill, and the community of Castaic Junction, which lies northeast of the Landfill.
- c. South Coast AQMD inspectors investigated the complaints – by verifying odors with complainants and tracing them back to CCL – and confirmed CCL as the source of the odors on numerous occasions. On May 18, 2023, South Coast AQMD issued a Notice of Violation (“NOV”) to CCL for public nuisance in violation of South Coast AQMD Rule 402 and California Health and Safety Code (CA H&S) Section 41700. Between April and December 31, 2023, South Coast AQMD issued 107 NOVs to CCL for public nuisance under South Coast AQMD’s Rule 402 and CA H&S Section 41700.
- d. CalRecycle also determined that odors were attributable to the reaction occurring at the Landfill. CalRecycle reported on October 16, 2023, that “the landfill gas generated in and around the reaction settlement area has exceeded the designed gas generation flow rate and caused increased emissions and odors.”⁴

³ These complaints appear in the Summary of Complaints Alleging Chiquita Landfill as Source from January 1, 2023, through December 31, 2023, prepared by South Coast AQMD (the “2023 Complaints Summary.”)

⁴ CalRecycle October 2023 Letter at 17.

- e. The complaints filed reflect that the public has suffered impacts due to the noxious odors, including reports of eye irritation, nosebleeds, tinnitus, nausea, migraines, vomiting, vertigo, respiratory symptoms, cardiac issues, and skin issues. Various members of the public reported that they are unable to have their children play outside in the yard, walk their pets, or exercise outdoors, due to odors from the Landfill. Noxious odors were reported by concerned parents, teachers, staff and students at schools as near as approximately 1.7 miles, and as far as approximately 5.0 miles, from the Landfill, including at Headstart Preschool in Val Verde, Playmakers Preschool in Castaic, Santa Clarita Valley International Elementary School in Castaic, Live Oak Elementary School in Castaic, Castaic Elementary School in Castaic, Castaic High School in Castaic, Rio Vista Elementary School in Canyon Country, West Ranch High School in Stevenson Ranch, and Valencia High School in Valencia.⁵ One parent in Castaic reported that it was “literally difficult to even walk to the car to take [the] kids to school.”⁶
- f. CCL maintains several air monitoring stations around the Landfill perimeter and within the nearest residential community. Pursuant to the CUP issued by the County of Los Angeles Department of Regional Planning, CCL’s monitoring stations continuously monitor for hydrogen sulfide (“H₂S”) and particulate matter (“PM”) concentrations. CCL’s H₂S monitors in the community showed the presence of H₂S in excess of 30 parts per billion from November 2022 through 2023.⁷
- g. Since mid-2023, CCL has also regularly collected grab samples and 24-hour samples for various compounds at the air monitoring sites in the community.⁸ Several of CCL’s 24-hour and grab samples showed above-background concentrations of benzene, exceeding 1 part per billion.⁹ One 24-hour sample in the community showed the presence of benzene in excess of 8 parts per billion.¹⁰
- h. On September 1, 2023, September 19, 2023, October 25, 2023, November 28,

⁵ See 2023 Complaints Summary.

⁶ Complaint was filed on September 15, 2023. See 2023 Complaints Summary.

⁷ Graph prepared by South Coast AQMD from Respondent’s sampling data from continuous air monitors in the community surrounding the Landfill, included as Petitioner’s Exhibit 29 to Proposed Findings and Decision for a Modified Stipulated Order for Abatement, In the Matter of South Coast Air Quality Management District vs. Chiquita Canyon, LLC, Case No. 6177-4, before the Hearing Board of the South Coast Air Quality Management District (“Proposed Modified AO.”)

⁸ Atmospheric Analysis & Consulting, Inc. report analyzing selected grab and 24-hour samples from the community surrounding the Landfill, sampled by Respondent, included as Petitioner’s Exhibit 30 to the Proposed Modified AO (“Community Grab and 24-hour Samples Lab Report.”)

⁹ See sampling data from September 5, 2023, October 10, 2023, October 17, 2023, November 7, 2023, November 21, 2023, and December 5, 2023, respectively, in the Community Grab and 24-hour Samples Lab Report.

¹⁰ See sampling data from November 7, 2023, in the Community Grab and 24-hour Samples Lab Report.

2023, and December 19, 2023, respectively, the LEA conducted inspections at the Landfill. The LEA inspector observed on each of these occasions that the methane gas concentrations at perimeter monitoring wells were above five percent (5%) by volume in air. The LEA issued violations to CCL for non-compliance with gas monitoring and control requirements under Title 27 of the California Code of Regulations (27 CCR), Section 20921(a).

- i. On September 7, 2023, the South Coast AQMD Hearing Board issued a Stipulated Abatement Order (the “Stipulated Abatement Order”) requiring, among other things, investigation and mitigation of odors, investigation of the Reaction Area, expansion of the landfill gas well and collection system, increased flaring, improvements to the cover of the Landfill, and a health study. Despite these efforts, noxious odors have continued to impact the communities surrounding the Landfill. South Coast AQMD has issued at least fifty-three (53) NOVs to CCL, based on the continuous noxious odors emanating from the Landfill since September 7, 2023.
- j. On January 17, 2024, the South Coast AQMD Hearing Board approved modifications to the Stipulated Abatement Order to address issues relating to the Landfill’s leachate collection system and other conditions resulting in increased emissions by, among other things, requiring expanded air monitoring and sampling in the surrounding community.¹¹ The South Coast AQMD AO states that the odor complaints received by the agency included “odor descriptions of both trash and landfill gas, but [South Coast AQMD] and [CCL] believe that all odors complained of related to landfill gas, leachate, and associated surface emissions rather than trash or the working face.”¹² South Coast AQMD asserted, “the ongoing subsurface reaction is the source of the odor complaints received from the public, and the root cause of an ongoing public nuisance.”¹³
- k. On February 7, 2024, Roux Associates, Inc. (“Roux”) issued a community air sampling and health risk report prepared on behalf of Los Angeles County for the investigation of outdoor air quality and the evaluation of potential health risks to residents of the communities surrounding the Landfill.¹⁴ From its independent review of existing continuous air monitoring data for the Landfill, Roux observed that ambient air levels for H₂S in the communities surrounding the Landfill periodically exceeded the California Environmental Protection Agency’s Office of Environmental Health Hazard Assessment acute and chronic recommended

¹¹ Findings and Decision for a Modified Stipulated Order for Abatement, In The Matter of South Coast Air Quality Management District vs. Chiquita Canyon, LLC, Case No. 6177-4, Before the Hearing Board of the South Coast Air Quality Management District (“South Coast AQMD AO.”)

¹² South Coast AQMD AO at 4.

¹³ South Coast AQMD AO at 4.

¹⁴ Roux Associates, Inc., “Community Air Sampling and Health Screening Evaluation Report: Val Verde and Castaic Communities, Los Angeles County, California,” (February 7, 2024) (“Public Health Report.”)

limits for H₂S of 0.03 ppm and 0.007 ppm, respectively. Roux explained, “H₂S can be an irritant to the eyes, nose, or throat, and can impact the neurological and respiratory systems. [Agency for Toxic Substances and Disease Registry] notes the most common symptoms following exposure to odorants include headaches, nasal congestion, eye, nose and throat irritation, hoarseness/sore throat, cough, chest tightness, shortness of breath, wheezing, heart palpitations, nausea, drowsiness and mental depression.”¹⁵

12. Complaints, Violations and Endangerment Due to Leachate and Leachate Condensate.

- a. Landfill leachate is formed when rainwater or other liquid filters through or drains from wastes placed in a landfill. When this liquid comes in contact with buried wastes, it leaches, or draws out, chemicals or constituents from those wastes. Condensate is the liquid generated as a result of the gas collection and recovery process.
- b. On September 19, 2023, October 25, 2023, and November 28, 2023, respectively, the LEA conducted inspections at the Landfill. The inspector observed on each of these occasions that leachate was leaking through slopes and pooling around gas wells in the upper northwestern to western areas of the Landfill. In November 2023, the inspector also observed that leachate was flowing and pooling on top of the installed scrim cover located on the west-facing Reaction Area slopes. The LEA issued violations to CCL for non-compliance with leachate control requirements under 27 CCR § 20790.
- c. On October 3, 2023, the RWQCB conducted an inspection of the Landfill and observed “a leachate seep in the north-western portion of the Main Canyon of the Landfill that flowed from the edge of the Landfill to a concrete V-ditch. The V-ditch widens to a flat-bottomed ditch on its course to the stormwater debris basin at the front of the Landfill.”¹⁶
- d. On October 17, 2023, the LEA stated in a letter to CCL that the conditions observed at the Landfill “are serious issues and have likely caused the many violations cited by the [South Coast AQMD] investigations this year,” and that “the CalRecycle analysis presents compelling evidence that the CCL needs to act promptly to address the current conditions for the protection of public health and the environment.”¹⁷ The LEA cautioned, with respect to CCL’s landfill gas

¹⁵ Public Health Report at 2.

¹⁶ Letter from RWQCB to Respondent, dated November 22, 2023, regarding Notice of Violation of Waste Discharge Requirements – Chiquita Canyon Landfill, Castaic, California (File No. 67-020, Order No. R4-2018-0172, Geotracker Global ID. L10003464243) (“RWQCB November 2023 NOV.”)

¹⁷ Letter from the LEA to Respondent, dated October 17, 2023, regarding Chiquita Canyon Landfill (SWIS No. 19-AA-0052) CalRecycle Review of the Ongoing Order Incident at Chiquita Canyon Landfill (“LEA October 2023 Letter.”)

control, emission, odor, and leachate issues, “[i]f prompt steps are not taken, the condition is likely to worsen, and may threaten the integrity of the landfill, thereby compromising the landfill cover.”¹⁸ The LEA expected CCL to complete various corrective and mitigation actions, including sampling of the leachate for benzene and other volatile organic compounds, as “past incidents similar to Chiquita Canyon . . . have shown that heating event increases the level of [volatile organic compounds] in the leachate.”¹⁹

- e. On November 2, 2023, representatives from the Regulatory Agencies performed a joint inspection at the Landfill. The Regulatory Agencies observed multiple new leachate outbreaks, as well as stability issues with leachate-saturated slopes and waste. They also observed continuing issues with high temperatures, landfill gas collection, excessive leachate production, and unusual and large-scale settlement. A portion of the Reaction Area had settled as much as twenty-five (25) to thirty (30) feet since 2022. From July 2023 to September 2023, the Reaction Area had expanded in all directions, most notably to the north and west, to an approximate size of thirty (30) to thirty-five (35) acres.
- f. During the November 2, 2023, joint inspection by the Regulatory Agencies, the RWQCB observed that the leachate seep into the concrete V-ditch to a flat-bottomed ditch on its course to the stormwater debris basin at the front of the Landfill was continuing. The RWQCB reported that CCL was pumping leachate into tanker trucks for off-Site disposal. Further, on November 8, 2023, EPA and South Coast AQMD inspectors observed that uncontrolled leachate condensate was spewing out of gas extraction wellheads twelve (12) to eighteen (18) feet into the air, due to the increased temperatures and pressure within the Reaction Area.
- g. Based on the findings from the joint inspection on November 2, 2023, and the LEA inspection on November 28, 2023, the LEA issued a violation to CCL for deteriorated conditions in the Reaction Area and for non-compliance with preventive maintenance program requirements under 27 CCR § 20750.
- h. On November 21, 2023, the LEA issued a letter to CCL requiring CCL to address the ongoing and uncontrolled reactions at the Landfill.²⁰ The LEA determined that it was “unlikely that CCL’s current mitigation measures will be sufficient to control and contain the reaction, which is expanding toward other areas of the [L]andfill.”²¹ The letter requires, among other actions: the installation of temperature monitoring devices to determine the intensity, depth, and direction

¹⁸ LEA October 2023 Letter at 2.

¹⁹ LEA October 2023 Letter at 3.

²⁰ Letter from the LEA to Respondent, dated November 21, 2023, regarding Chiquita Canyon Landfill (SWIS No. 19-AA-0052) CalRecycle’s Review of Conditions at the Landfill Response Letter (“LEA November 2023 Letter.”)

²¹ LEA November 2023 Letter at 2.

of the reaction; the development of a plan and constructing a soil barrier between the reaction and operational areas; the placement and compacting of a minimum cover of 24 inches of 1×10^{-6} low permeability soil in and around the reaction settlement area and any well showing signs of reaction; the development of a written plan to document and track fissures, settlement, and tension cracks in the soil cover; the performance of a slope stability analysis of the western slope near the leachate outbreak; and the collection of temperature readings in and around the Reaction Area to meet the manufacturer's temperature design specifications to ensure the French drain installed by CCL does not fail due to the elevated temperature of the leachate.

- i. On November 22, 2023, the RWQCB issued a NOV to CCL, noting that CCL failed to continuously protect and maintain leachate and landfill-gas condensate containment systems to ensure their effectiveness and to prevent commingling of leachate and gas condensate with surface water run-on and run-off. The RWQCB observed that the "conditions in the area of the leachate seep at the Landfill are not adequate to prevent the commingling of leachate and gas condensate with surface water run-on and run-off during a rain event."²² The RWQCB also cited CCL for failing to report the leachate seepage to the RWQCB upon discovery.
- j. CCL acknowledged that leachate seepage occurred on the western slope of the Landfill from April through November 2023, and was present in levels that reached the stormwater channel on the western slope and intermittently on the northern slope of the Landfill.
- k. Benzene is an EPA Hazardous Waste (No. D018) with a Toxicity Characteristic Leaching Procedure ("TCLP") regulatory level of 0.5 mg/L.
- l. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells, leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection. The United States Department of Health and Human Services has determined that benzene causes cancer in humans. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.
- m. On December 12, 2023, DTSC and EPA performed an inspection of the Reaction Area and collected samples of the uncontrolled leachate condensate waste from the gas extraction wellheads.²³ The temperature of the leachate was as high as 180°F. There were TCLP exceedances for benzene in the samples, as high as 0.59

²² RWQCB November 2023 NOV at 2.

²³ Environmental Chemistry laboratory results from DTSC sampling data (DTSC Case #15921) from site visit on December 12, 2023 ("DTSC December Lab Report.")

mg/L and 0.91 mg/L.²⁴ CCL reported test results of the split samples of the leachate condensate provided to CCL from DTSC during the inspection with TCLP exceedances for benzene of 0.59 mg/L, 1.2 mg/L and 2.9 mg/L.²⁵

- n. CCL's test results from various samples contained evidence of TCLP exceedances for benzene in condensate samples taken as early as August 2023.²⁶
- o. CCL has been transporting leachate from the Landfill to multiple facilities for off-Site disposal, including Avalon Premium Tank Cleaning ("Avalon") and Patriot Environmental Services ("Patriot").
- p. On December 27, 2023, Avalon sampled the leachate from a tanker truck delivering leachate from the Landfill and found that the leachate had a TCLP exceedance for benzene of 0.538 mg/L.²⁷
- q. On January 25, 2024, CCL issued a letter to Avalon to inform it of "three recent laboratory tests on discrete samples of the leachate generated at the Chiquita Canyon Landfill, some of which may have been sent to [the] facility for treatment and subsequent disposal," which "three tests indicated somewhat elevated levels of [benzene]."²⁸ CCL reported that grabs samples taken from the location where the vacuum trucks connect to a set of tanks at the Landfill on November 30, 2023, December 6, 2023, and December 27, 2023, had benzene concentrations of 0.92 mg/L, 1.2 mg/L, and 0.538 mg/L, respectively. CCL estimated that there could have been as many as seventy-six (76) truck-loads of this contaminated liquid delivered to two facilities, including Avalon, over the course of numerous days.
- r. On January 26, 2024, CCL issued a letter to Patriot to inform it of "several leachate loads sent to [the] facility between January 23 and January 25, 2024, that may have contained somewhat elevated levels of benzene."²⁹ CCL reported that a grab sample taken from the location where the vacuum trucks connect to a set of tanks at the Landfill on January 23, 2024, had a benzene concentration of 0.65 mg/L. CCL advised that based on a review of its waste manifests, at least

²⁴ DTSC December Lab Report at 28.

²⁵ Weck Laboratories, Inc., Certificate of Analysis Final Reports for samples taken by Respondent on December 13, 2023.

²⁶ Weck Laboratories, Inc., Certificate of Analysis Final Reports for samples taken by Respondent on August 29, 2023, November 30, 2023 and December 6, 2023.

²⁷ Enviro – Chem, Inc. Laboratory Report, dated January 4, 2024, prepared for Avalon, analyzing samples from December 27, 2023.

²⁸ Letter from Respondent to Avalon, dated January 25, 2024, regarding Notification of Leachate Analytical Results from the Chiquita Canyon Landfill.

²⁹ Letter from Respondent to Patriot, dated January 26, 2024, regarding Notification of Leachate Analytical Results from the Chiquita Canyon Landfill.

eleven (11) truck-loads of this contaminated liquid had been sent to Patriot over the course of three (3) days.

- s. On February 15, 2024, DTSC issued violations to CCL related to CCL's leachate management and disposal including violations for failing to make a proper waste determination, disposing of hazardous waste at an unauthorized point, causing storage and treatment of hazardous waste at an unauthorized point, failing to use a hazardous waste manifest, and failing to minimize the possibility of release of hazardous waste or hazardous waste constituents.

13. Regulatory Agencies' Response and Issuance of this UAO.

- a. On November 30, 2023, a Multi-Agency Critical Action Team ("MCAT") was formed among the local, state, and federal regulatory agencies overseeing CCL for the purpose of coordinating regulatory expertise, resources and legal authorities to address the human health and environmental impacts caused by the deteriorating conditions at the Landfill. All members of the MCAT were notified of this UAO prior to issuance and were invited to share comments to, and recommendations for, its contents. This UAO reflects the technical expertise and subject-matter knowledge contributed by the MCAT through this engagement process.
- b. The actions required by this UAO, including financial assurances, may be necessary to protect human health or the environment by mitigating the noxious air emissions and properly handling, storing, treating and disposing of hazardous leachate waste resulting from the deteriorated conditions in Reaction Area within the Landfill. Such emissions and leachate emanating from the Landfill could cause injury, detriment, nuisance, annoyance or endanger the comfort, repose, health or safety of any persons or have a natural tendency to cause injury or damage to the physical environment.

VI. CONCLUSIONS OF LAW AND DETERMINATIONS

14. Based on the Findings of Fact set forth above, and an administrative record supporting this UAO, EPA has determined that:

- a. Under RCRA:
 - (1) Respondent is a "person" as defined in Section 1004(15) of RCRA, 42 U.S.C. § 6903(15).
 - (2) Contaminated soils, organic materials and other materials accepted for disposal at the Site are each discarded material, and therefore are each a "solid waste" as defined in Section 1004(27) of RCRA, 42 U.S.C. § 6903(27).

- (3) Leachate and/or leachate condensate emanating from the Landfill near or above the Reaction Area at the Site contains hazardous materials including, but not limited to, benzene, and therefore is a “hazardous waste” as defined in Section 1004(5) of RCRA, 42 U.S.C. § 6903(5).
- (4) Imminent and Substantial Endangerment Under RCRA. The past and present handling, storage, treatment and disposal of contaminated materials and leachate may present an imminent and substantial endangerment to human health or the environment within the meaning of Section 7003(a) of RCRA, 42 U.S.C. § 6973(a).
- (5) Respondent, as the operator of the Site, contributed and is contributing to the handling, storage, treatment, and disposal of solid and hazardous wastes from which air emissions and leachate waste streams are causing a potential endangerment.

b. Under CERCLA:

- (1) The Site is a “facility” as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).
- (2) Respondent is a “person” as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).
- (3) Respondent is a liability party under one or more provisions of Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), including, but not limited to, the following:
 - i. CCL is the “owner(s)” and/or “operator(s)” of the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).
- (4) The leachate condensate, which tested to include elevated levels of benzene, as identified in the Findings of Fact above, includes “hazardous substances” as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).
- (5) The conditions described in the Findings of Fact above constitute an actual and/or threatened “release” of a hazardous substance from the facility as defined by Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).
- (6) The conditions at the Site may constitute a threat to public health or welfare or the environment, based on the factors set forth in Section 300.415(b)(2) of the NCP. These factors include, but are not limited to,

the following:

- i. actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances. This factor is present at the Site due to the existence of leachate and leachate condensate emanating from the Landfill near or above the Reaction Area at the Site containing hazardous materials, including benzene with concentrations in excess of the TCLP threshold. There are several potential pathways for individuals on and off-Site to be exposed to hazardous substances, including, but not limited to: the migration of air emissions, potential contamination of the groundwater if the Reaction compromises the Landfill lining, and threats to human health caused by disposal of untreated hazardous waste leachate and/or leachate condensate at off-Site receiving facilities; and
 - ii. hazardous substances in soils largely at or near the surface, that may migrate. This factor is present at the Site due to the existence of leachate and leachate condensate emanating from the Landfill near or above the Reaction Area at the Site containing hazardous materials including, but not limited to, benzene with concentrations in excess of the TCLP threshold. The hazardous leachate or condensate may discharge via stormwater run-off into surface waters downstream and impair aquatic life and wildlife uses of the Santa Clara River. Leachate has been observed seeping into a concrete ditch on its course to the stormwater basin which ultimately discharges to the Santa Clara River. Hazardous substances may also migrate to and contaminate groundwater if the Reaction compromises the Landfill lining.
- (7) Imminent and Substantial Endangerment Under CERCLA. The conditions described in the Findings of Fact above may constitute an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened release of a hazardous substance from the facility within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a). The actions required by this UAO are necessary to protect human health or the environment.

VII. ORDER

15. Based on the administrative record for the Site and Section V (Findings of Fact) and Section VI (Conclusions of Law and Determinations) set forth above, the following is hereby ordered: Respondent shall comply with all provisions of this UAO, including, but not limited to, any appendices to this UAO and all documents incorporated by reference

into this UAO.

16. Respondent shall finance and perform the Work in accordance with this UAO, plans, standards, specifications and schedules set forth in this UAO or developed by Respondent and approved by EPA pursuant to this UAO.

VIII. WORK TO BE PERFORMED

17. Selection of Contractors, Personnel. All Work performed under this UAO shall be under the direction and supervision of qualified personnel. Within thirty (30) days after the Effective Date, Respondent shall notify EPA in writing of the names, titles, addresses, telephone numbers, email addresses, and qualifications of the personnel, including contractors, subcontractors, consultants, and laboratories to be used in carrying out such Work. If, after the commencement of the Work, Respondent retains additional contractors or subcontractors, Respondent shall notify EPA of the names, titles, contact information, and qualifications of such contractors or subcontractors retained to perform the Work at least five (5) days prior to commencement of Work by such additional contractors or subcontractors. EPA retains the right, at any time, to disapprove of any or all of the contractors and/or subcontractors retained by Respondent. If EPA disapproves of a selected contractor or subcontractor, Respondent shall retain a different contractor or subcontractor and shall notify EPA of that contractor's or subcontractor's name, title, contact information, and qualifications within five (5) days after EPA's disapproval. With respect to any proposed contractor, Respondent shall demonstrate that the proposed contractor demonstrates compliance with ASQ/ANSI E4:2014 "Quality management systems for environmental information and technology programs – Requirements with guidance for use" (American Society for Quality, February 2014), by submitting a copy of the proposed contractor's Quality Management Plan ("QMP"). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, Reissued May 2006) or equivalent documentation as determined by EPA. The qualifications of the persons undertaking the Work for Respondent shall be subject to EPA's review for verification based on objective assessment criteria (e.g., experience, capacity, technical expertise) and that they do not have a conflict of interest with respect to the project.
18. Project Coordinator. Before, or within two (2) days of, the Effective Date of this UAO, Respondent shall designate a Project Coordinator who shall be responsible for administration of the Work required by this UAO. Respondent shall notify EPA in writing within three (3) days of the Effective Date of this UAO of the name, address, phone number, electronic mail address and qualifications of the Project Coordinator.
19. EPA will approve/disapprove of Respondent's Project Coordinator (original or replacement) based upon the person's qualifications and ability to effectively perform this role. The qualifications of the persons undertaking the Work for Respondent shall

be subject to EPA's review, for verification that such persons meet minimum technical background and experience requirements. All persons under the direction and supervision of Respondent's Project Coordinator must possess all necessary professional licenses required by federal and state law.

20. EPA has designated the following individuals of the Regional Enforcement and Compliance Assurance Division, as its Project Coordinator and Alternate Project Coordinator (collectively, the "EPA Project Coordinators"). The EPA Project Coordinators shall be responsible for overseeing the implementation of this UAO. EPA will notify Respondent of a change of its designated EPA Project Coordinators. Communications between Respondent and EPA, and all documents concerning the activities performed pursuant to this UAO, shall be directed to the EPA Project Coordinators.

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The EPA Project Coordinators shall be EPA's designated representatives for the Site. Unless otherwise provided in this UAO, all reports, correspondence, notices, or other submittals relating to or required under this UAO shall be in writing and shall be sent to the EPA Project Coordinators at the address specified in this Paragraph 20, unless EPA otherwise directs. Reports, correspondence, notices or other submittals shall be delivered by electronic mail. All correspondence shall include a reference to the case caption EPA Docket No. RCRA 7003-09-2024-0001 and CERCLA 106-09-2024-05.

21. Respondent shall undertake and complete all of the Work to the satisfaction of EPA, pursuant to RCRA § 7003, 42 U.S.C. § 6973 and CERCLA § 106, 42 U.S.C. § 9606. All of the Work performed under this UAO shall be under the direction and supervision of Respondent's Project Coordinator and shall be in accordance with the terms of this UAO.
22. Response Action. Respondent shall perform, at a minimum, all actions necessary to

implement the Work required in this UAO, and the approved Work Plan(s). The required actions to be implemented include, but are not limited to, the following:

- a. Upon the Effective Date, Respondent shall immediately store, transport leachate solid and/or hazardous waste only in accordance with RCRA, 42 U.S.C. Sections 6900, *et seq.*, and associated regulations. All hazardous waste shall be disposed of at a treatment, storage and disposal facility preapproved by EPA.
- b. Within thirty (30) days of the Effective Date, Respondent shall provide to EPA a master work plan ("Master Work Plan"), including an expeditious schedule to meet, the following objectives: (1) remedy and prevent off-Site impacts caused by odors, emissions, leachate or other waste streams; and (2) deploy measures to delineate, fully characterize, prevent the expansion of, contain, and reduce the smoldering or the subsurface reaction occurring at the Landfill. The Master Work Plan shall incorporate all ongoing and planned activities to meet environmental requirements and directives applicable to Respondent and the Landfill pursuant to local, state, or federal laws, regulations, permits, orders or agreements (each an "Environmental Obligation," and collectively, the "Environmental Obligations"), including, but not limited to, the requirements, directives and activities identified by the Regulatory Agencies to manage waste streams at the Site, to mitigate the migration of waste streams off-Site, and to mitigate the harm caused by the subsurface reaction or smoldering. In no event shall Respondent's obligations under the Master Work Plan be less stringent than Respondent's obligations under any Environmental Obligation, and in no event shall the provisions of the Master Work Plan conflict with the provisions of any Environmental Obligation.
- c. Without limiting the foregoing, the Master Work Plan shall incorporate the following:
 - (1) A "Leachate Management Plan" that includes the following criteria or components:
 - i. Standard operating procedures to identify leachate seeps and any necessary repairs or improvements to the leachate collection system;
 - ii. Process to adequately characterize leachate, condensate and all waste streams that are potentially hazardous;
 - iii. Process to collect all leachate and remove it from the Site on a daily basis or as often as necessary to reduce exposure of leachate to the atmosphere at the Landfill to the greatest extent feasible, and in any event so as to prevent standing leachate and the

- pooling or ponding of leachate exposed to the atmosphere throughout the facility;
- iv. Operating procedures to store leachate on Site in a manner that prevents leachate and leachate off-gas/VOC emissions/fumes exposure to the atmosphere, including operating procedures to route all collected gases to air emissions control equipment;
 - v. Operating procedures to transport waste streams to appropriate locations for disposal at a facility. All waste streams characterized as hazardous shall only be disposed of at a facility pre-approved by the EPA and permitted to treat, store and dispose of hazardous waste; and
 - vi. Operating procedures shall include obtaining any required permit(s) from the appropriate local, state, or federal agency for on-Site leachate management activities.
- (2) A "Soil Reaction Break/Barrier Plan" that includes the following criteria or components:
- i. Installation of temperature monitoring devices with a telemetry system to collect and record the temperature data necessary for evaluating the intensity, depth, speed and direction of the reaction;
 - ii. A set of criteria (e.g., what temperature thresholds at which temperature probes that border the Reaction Area) that would require installation of a soil reaction break between the reaction and operational areas of the Landfill;
 - iii. Specifications of the depth, width, material, and location of the containment trench (wall) based on temperature readings collected by the temperature probe network;
 - iv. Specifications of the volume of the waste to be excavated to install the soil reaction break between the reaction and operational areas of the Landfill;
 - v. Procedures for characterization and disposal of waste displaced by excavation;
 - vi. Procedure to cover the excavated area for the soil reaction break at the end of shifts;

- vii. Process to ensure that the soil reaction break is finished with 24 inches of 1×10^{-6} low permeability soil;
 - viii. Construction time estimates to complete the soil reaction break; and
 - ix. Provision for weekly updates for the soil reaction break construction until fully completed.
- (3) A "Cover Installation Plan" that includes the following criteria or components:
- i. Installation of a High-Density Polyethylene geomembrane with at least thirty (30) mil thickness ("Geomembrane Cover") to address the inadequacy of the current cover in the reaction settlement area resulting from the ongoing reaction;
 - ii. System and procedure to ensure that landfill gas ("LFG") does not accumulate under the Geomembrane Cover if the LFG collection and control system is inoperative due to power outage, such as through the use of a thermal oxidizer with its own power supply;
 - iii. System and procedure to prioritize LFG extraction from the Reaction Area over other areas of the Landfill in order to prevent the accumulation of LFG under the Geomembrane Cover should the LFG collection and control system lose vacuum;
 - iv. Timeline and provisions for weekly updates for the Geomembrane Cover installation until fully completed;
 - v. Process to document and track fissures, settlement, and tension cracks in the soil cover, including a photo log of the fissure location including the length and severity and corrective action taken and a weekly report to EPA by each Tuesday;
 - vi. Tracking and documentation of maintenance issues pertaining to the Geomembrane Cover once any portion of the Geomembrane Cover is installed. Notification to EPA of any structural issues that arise with the Geomembrane Cover; and
 - vii. Processes to ensure the maximum possible collection and control of LFG and associated odors from the Reaction Area and directly adjacent areas where Reaction Area LFG may migrate to, and minimization of fugitive emissions from the Geomembrane Cover and LFG collection components.

- (4) A “Slope Stability Analysis” work plan, subject to approval by the LEA, for the western slope in the Reaction Area.
- (5) Collection of temperature data in and around the Reaction Area to meet the manufacturer’s temperature design specifications/recommendations to ensure that the materials and parts used for mitigation activities do not fail after installation due to elevated temperature of the leachate, e.g., French drain.
- (6) An “Air Monitoring Plan” that includes the following criteria or components:
 - i. Installation and operation of air monitoring equipment on-Site and off-Site and provision of access to monitoring data so as to permit the Regulatory Agencies to identify transport of odors and other emissions from the Landfill, identify techniques that may be used to remedy potential odor impacts on the nearby community, and provide this data to inform the community in a timely manner;
 - ii. Enhancement of current ambient air monitoring program to include dimethyl sulfide and other constituents of landfill gas, including sampling at or near residential properties where recent odor complaints have been reported, sampling at on-Site locations where odors are most pronounced, and completion of a flux chamber study;
 - iii. Real-time continuous monitoring for particulate matter (“PM”) 2.5, PM10, and H2S recorded at monitoring stations at the fence-line of the Landfill (e.g., monitors MS-01 through MS-05) and in the community surrounding the Landfill (e.g., monitors MS-06 through MS-12);
 - iv. Real-time continuous monitoring for total reduced sulfur, and toxic air contaminants recorded by enhanced monitors at the fence-line of the Landfill (e.g., monitor MS-04);
 - v. Installation and implementation of instruments capable of measuring (i) hazardous substances, including Total Reduced Sulfides, Hydrogen Sulfide and all Toxic Air Contaminants listed in Table 1 of South Coast AQMD Rule 1150.1 and (ii) hourly concentrations of volatile organic compounds with Site surface emissions greater than (1) ton/year, including but not limited to, MS-02, MS-05, MS-06, MS-07, MS-10, MS-11 and MS-12; and

- vi. Requirement to make any continuous air monitoring data available to the public in real-time by posting such data on a dedicated webpage that shows a map of the location from which such data was obtained and that includes a graph of the measured pollutant(s) over time along with a depiction of any applicable health-based threshold or standard for such pollutant(s).

(7) An “Off-Site Migration Prevention Plan” to monitor and prevent off-Site migration of leachate or other contaminants or pollutants which may contaminate surface or subsurface water that includes the following criteria or components:

- i. Installation of wells in the alluvial aquifer downgradient of the Reaction Area and sediment basins, sufficient to monitor potential contamination of groundwater and interconnected surface waters, and to identify and track subsurface migration of contamination from the Landfill to groundwater or surface waters, including to the Santa Clara River;
- ii. Assessment and monitoring of the Landfill liner collection system integrity in the Reaction Area using appropriate indicators/surrogates; and
- iii. Additional monitoring for leachate-related constituents in stormwater runoff and maintenance of stormwater management systems, including but not limited to stormwater practices to prevent/minimize contact of leachate and stormwater, practices to prevent discharge of leachate contaminated stormwater to the unlined settlement basins to prevent groundwater contamination, and practices to prevent off-Site discharge of leachate contaminated stormwater.

23. The Work undertaken pursuant to this UAO shall be conducted in compliance with all applicable EPA guidance, policies and procedures, and with this UAO, and is subject to EPA approval. Pending approval of any Work Plan hereunder by EPA, Respondent shall continue, and shall not delay due to the pending approval required by this UAO, any ongoing and planned activities to meet environmental requirements and directives applicable to Respondent and the Landfill pursuant to any Environmental Obligation, including, but not limited to, the requirements, directives and activities identified by the Regulatory Agencies to manage waste streams at the Site, to mitigate the migration of waste stream off-Site, and to mitigate the harm caused by the subsurface reaction or smoldering, notwithstanding whether such work may also constitute the Work required by this UAO. Respondent shall take into consideration the progress and/or completion

of any such ongoing work when preparing its expeditious schedule for its Master Work Plan. Following EPA's approval or modification of the Master Work Plan, Respondent shall implement the Master Work Plan in accordance with the schedule and provisions approved by EPA.

24. Sampling and Analysis Plan. Within thirty (30) days after the Effective Date, Respondent shall submit a Sampling and Analysis Plan to EPA for review and approval. This plan shall consist of a Field Sampling Plan ("FSP") and a Quality Assurance Project Plan ("QAPP") that is consistent with the applicable regulations guidance documents, including "Guidance for Quality Assurance Project Plans (QA/G-5)" EPA/240/R-02/009 (December 2002), "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" EPA 240/B-01/003 (March 2001, reissued May 2006), and "Uniform Federal Policy for Quality Assurance Project Plans," Parts 1-3 EPA/505/B-04/900A-900C (March 2005). Upon its approval by EPA, the Sampling and Analysis Plan shall be incorporated into and become enforceable under this UAO.
25. Health and Safety Plan. Respondent shall develop a Health and Safety Plan and it shall be implemented during the Work performed under this UAO. This Health and Safety Plan shall be prepared in accordance with "OSWER Integrated Health and Safety Program Operating Practices for OSWER Field Activities," Pub. 9285.0-OIC (Nov. 2002), available on the NSCEP database at <https://www.epa.gov/nscep>, and "EPA's Emergency Responder Health and Safety Manual," OSWER Directive 9285.3-12 (July 2005 and updates), available at <https://www.epaosc.org/HealthSafetyManual/manual-index.htm>. In addition, the Health and Safety Plan shall comply with all currently applicable Occupational Safety and Health Administration regulations found at 29 C.F.R. Part 1910. Respondent shall incorporate all changes to the Health and Safety Plan recommended by EPA.
26. Progress Reports. Respondent shall submit a written progress report to EPA concerning actions undertaken pursuant to this UAO on a monthly basis, or as otherwise requested by EPA, from the date of receipt of EPA's approval of the Master Work Plan until notice of termination is delivered pursuant to Section XXV (Termination and Satisfaction), unless otherwise directed in writing by the EPA Project Coordinators. These reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.
27. Final Report. Within fifteen (15) days after completion of all Work required by this UAO, with the exception of any continuing obligations required by this UAO, including Respondent's obligations to comply with Sections XIV (Sampling, Access and Data Availability), XVI (Record Retention), XVIII (Reservation of Rights), and XXII

(Indemnification) of this UAO, Respondent shall submit for EPA review and approval a final report summarizing the actions taken to comply with this UAO. EPA will review and approve the final report in accordance with Section XXV (Termination and Satisfaction). The final report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with the UAO, a listing of quantities and types of materials removed off-Site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination(s) of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during the removal actions (e.g., manifests, invoices, bills, contracts, and permits). The final report shall also include the certification required under Section XIII (Document Certification).

28. Off-Site Shipments.

- a. Respondent may ship hazardous substances, pollutants, and contaminants as defined under Sections 101(14) and (33) of CERCLA, 42 U.S.C. § 9601, from the Site to an off-Site facility only if it complies with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if Respondent obtains a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b). Without limiting the foregoing, Respondent may ship hazardous waste as defined under Section 1004(5) of RCRA, 42 U.S.C. § 6903(5), from the Site to an off-Site facility only if it complies with 40 C.F.R. § 262.20 of RCRA.
- b. Respondent may ship Waste Material from the Site to an out-of-State waste management facility only if, prior to any shipment, it provides written notice to the appropriate state environmental official in the receiving facility's state and the EPA. This notice requirement will not apply to any off-Site shipments when the total quantity of all such shipments will not exceed ten cubic yards. The written notice must include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. Respondent shall also notify the state environmental official referenced above and the EPA of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-State facility. Respondent shall provide the notice after the award of the contract for the removal action and before the Waste Material is shipped.
- c. Respondent may ship Investigation Derived Waste ("IDW") from the Site to an off-Site facility only if it complies with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, EPA's "Guide to Management of Investigation

Derived Waste,” OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the Action Memorandum. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 C.F.R. § 261.4(e) shipped off-Site for treatability studies, are not subject to 40 C.F.R. § 300.440.

IX. EPA APPROVAL OF DELIVERABLES

29. Deliverables required by this UAO shall be submitted to EPA for approval or modification. All deliverables must be delivered by electronic mail at EPA by the due date specified in this UAO or by schedules developed pursuant to this UAO. Deliverables shall be provided to the EPA Project Coordinators by electronic mail at:

Tyler Holybee and Mark Anthony Relon
Enforcement and Compliance and Compliance Assurance Division (ENF-2)
75 Hawthorne Street
San Francisco, California 94105
(415) 972-3765 and (415) 972-3252
Holybee.Tyler@epa.gov and Relon.Markanthony@epa.gov

Additionally, Respondent shall post all deliverables on a virtual platform and make them available to the Regulatory Agencies.

30. Respondent shall submit all deliverables in electronic form. Respondent shall provide data and corresponding information in editable Excel format, and not in image format. If Excel format is not available, then the format should allow for data to be used in calculations by a standard spreadsheet program such as Excel. All other deliverables shall be submitted to EPA in the form specified by the EPA Project Coordinators.
31. After review of any deliverable that is required pursuant to this UAO, EPA will: (a) approve, in whole or in part, the submission; (b) approve the submission on specified conditions; (c) modify the submission to cure the deficiencies; (d) disapprove, in whole or in part, the submission, directing that Respondent modify the submission; or (e) any combination of the above. However, EPA will not modify a submission without first providing Respondent at least one notice of deficiency and an opportunity to cure within five (5) days, except where EPA determines that to do so would cause serious disruption to the Work or where EPA has disapproved previous submission(s) due to material defects and EPA determines that the deficiencies in the submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.
32. In the event of approval, approval on conditions, or modification by EPA, pursuant to this Section, Respondent shall proceed to take any action required by the deliverable, as approved or modified by EPA.
33. Resubmission of Deliverable. On receipt of a notice of disapproval, in whole or in part,

pursuant to this Section, Respondent shall, within five (5) days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the deliverable for approval.

34. Notwithstanding the receipt of a notice of disapproval pursuant to this Section, Respondent shall proceed, at the direction of EPA, to take any action required by any non-deficient portion of the submission. Implementation of any non-deficient portion of a submission shall not relieve Respondent of any liability for penalties for non-compliance regarding the deficient portion of the deliverable.
35. In the event that a resubmitted deliverable, or portion thereof, is disapproved by EPA, EPA may again require Respondent to correct the deficiencies, in accordance with the preceding Paragraphs. EPA also retains the right to modify or develop the plan, report or other item. Respondent shall implement any action as required in a deliverable that has been modified or developed by EPA.
36. If on resubmission, a deliverable is disapproved or modified by EPA due to a material defect, Respondent shall be deemed to have failed to submit such deliverable timely and adequately.
37. All deliverables required to be submitted to EPA under this UAO shall, on approval or modification by EPA, be incorporated into and be enforceable under this UAO. In the event that EPA approves or modifies a portion of a deliverable required to be submitted to EPA under this UAO, the approved or modified portion shall be enforceable under this UAO.

X. MODIFICATION OF THE WORK

38. If at any time during the implementation of the Work, Respondent identifies a need for a compliance date modification or revision of any Work Plan, Respondent shall submit a memorandum documenting the need for the modification or revision to the EPA Project Coordinators. EPA in its discretion will determine if the modification or revision is warranted and may provide written approval or disapproval. Any approved modified compliance date or Work Plan modification is incorporated by reference into this UAO.
39. Emergency Response. In the event of any action or occurrence during the performance of the Work that constitutes an emergency situation or may present an immediate threat to human health and the environment, Respondent shall immediately take all appropriate action to minimize such emergency or threat and shall immediately notify the National Response Center at (800) 300-2193 and EPA's Project Coordinators. Respondent shall take such immediate and appropriate actions in consultation with EPA's Project Coordinators. Respondent shall take these actions in accordance with all applicable provisions of this UAO, including the Health and Safety Plan. Respondent shall then submit to EPA written notification of such emergency or threat at the Site within

three (3) days of such discovery. Respondent shall thereafter submit to EPA for approval a plan to mitigate this threat. EPA will approve or modify this plan in accordance with the provisions of Section IX (EPA Approval of Deliverables) of this UAO, and Respondent shall implement this plan as approved or modified by EPA. In the case of an extreme emergency, Respondent may act as it deems appropriate, at its own risk, to protect human health or the environment.

40. Release Reporting. Upon the occurrence of any event during performance of the Work that Respondent is required to report pursuant to Section 103 of CERCLA, 42 U.S.C. §9603, or Section 304 of the Emergency Planning and Community Right-To-Know Act (EPCRA), 42 U.S.C. § 11004, Respondent shall immediately orally notify the EPA Project Coordinators, or, in the event of their unavailability, the Regional Duty Officer at (800) 300-2193, and the National Response Center at (800) 424-8802. This reporting requirement is in addition to, and not in lieu of, the reporting required by CERCLA § 103 or EPCRA § 304.

XI. QUALITY ASSURANCE

41. Respondent shall use quality assurance, quality control, and other technical activities and chain of custody procedures for all samples consistent with “EPA Requirements for Quality Assurance Project Plans (QA/R5),” EPA/240/B-01/003 (March 2001, reissued May 2006), “Guidance for Quality Assurance Project Plans (QA/G-5),” EPA/240/R-02/009 (December 2002), and “Uniform Federal Policy for Quality Assurance Project Plans,” Parts 1-3, EPA/505/B-04/900A-900C (March 2005).
42. Respondent shall ensure that EPA personnel and its authorized representatives are allowed access at reasonable times to all laboratories utilized by Respondent pursuant to this order. Respondent shall ensure that all laboratories employed for analyses shall analyze all samples submitted by EPA pursuant to the QAPP for quality assurance, quality control, and technical activities that will satisfy the stated performance criteria as specified in the QAPP and that sampling and field activities are conducted in accordance with the EPA’s “EPA QA Field Activities Procedure,” CIO 2105-P-02.1 (9/23/2014) available at <https://www.epa.gov/irmpoli8/epa-qa-field-activities-procedures>. Respondent shall ensure that the laboratories it utilizes for the analysis of samples taken pursuant to this UAO meet the competency requirements set forth in EPA’s “Policy to Assure Competency of Laboratories, Field Sampling, and Other Organizations Generating Environmental Measurement Data under Agency-Funded Acquisitions” available at <https://www.epa.gov/measurements/documents-about-measurement-competency-under-acquisition-agreements> and that the laboratories perform all analyses using EPA-accepted methods. Accepted EPA methods consist of, but are not limited to, SW 846 “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” (<https://www.epa.gov/hw-sw846>). However, upon approval by EPA, Respondent may use other appropriate analytical method(s), as long as

(i) quality assurance/quality control (“QA/QC”) criteria are contained in the method(s) and the method(s) are included in the QAPP, (ii) the analytical method(s) are at least as stringent as the methods listed above, and (iii) the method(s) have been approved for use by a nationally recognized organization responsible for verification and publication of analytical methods, e.g., EPA, ASTM, NIOSH, OSHA, etc. Respondent shall ensure that all laboratories it uses for analysis of samples taken pursuant to this UAO have a documented Quality System that complies with ASQ/ANSI E4:2014 “Quality management systems for environmental information and technology programs – Requirements with guidance for use” (American Society for Quality, February 2014), and “EPA Requirements for Quality Management Plans (QA/R-2)” EPA/240/B-01/002 (March 2001, reissued May 2006), or equivalent documentation as determined by EPA. EPA may consider Environmental Response Laboratory Network laboratories, laboratories accredited under the National Environmental Laboratory Accreditation Program, or laboratories that meet International Standardization Organization standards or other nationally recognized programs as meeting the Quality System requirements. Respondent shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this UAO are conducted in accordance with the procedures set forth in the QAPP approved by EPA.

43. EPA reserves the right to require a change in laboratories for reasons which may include, but shall not be limited to, QA/QC performance, conflict of interest, or confidential agency audit information. In the event EPA requires a laboratory change, Respondent shall propose two alternative laboratories within thirty (30) days. Once EPA approves of the laboratory change, Respondent shall ensure that laboratory service shall be made available within fifteen (15) days.

XII. ADMINISTRATIVE DOCUMENTATION

44. EPA retains the responsibility for the issuance of any decision documents related to the Site.
45. EPA will provide Respondent with copies of all decision documents for the Site.
46. Submission of Documentation. EPA will determine the contents of and maintain the administrative record file. The administrative record supporting this UAO and the Work to be performed shall be available for public review in EPA’s offices at 75 Hawthorne Street, San Francisco, California (94105). A copy of the administrative record will also be available for viewing at a local repository established by EPA.

XIII. DOCUMENT CERTIFICATION

47. Any report or other document submitted by Respondent pursuant to this UAO that makes recommendations as to whether or not further actions are necessary or makes any representation concerning Respondent’s compliance or noncompliance with any

requirement of this UAO shall be certified by a responsible corporate officer for Respondent. A responsible corporate officer means: a president, secretary, treasurer, or vice-president in charge of a principal business function, or any other person who performs similar policy or decision-making functions.

48. The certification required by Paragraph 47 above shall be in the following form:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____

Name: _____

Title: _____

Date: _____

XIV. SAMPLING, ACCESS AND DATA AVAILABILITY

49. All results of sampling, testing, modeling or other data generated (including raw data if requested) by Respondent, or on Respondent's behalf, during implementation of this UAO shall be validated by Respondent and submitted to EPA promptly upon receipt by Respondent or its agents of such results by posting such results at the Chiquita Canyon Landfill Task Force Update webpage. Respondent shall tabulate data chronologically by media. EPA will make available to Respondent data generated by EPA for the purposes of oversight of the Work unless it is exempt from disclosure by any federal or state law or regulation.
50. Upon request, Respondent shall provide split or duplicate samples to EPA or its authorized representatives. Respondent shall notify EPA not less than seven (7) days in advance of any sample collection activity. In addition, EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall provide to Respondent split or duplicate samples of any samples it takes as part of EPA's oversight of Respondent's implementation of the Work.
51. Site Access. Pursuant to RCRA Section 3007(a), 42 U.S.C. § 6927(a) and CERCLA Section 104(e)(3), 42 U.S.C. § 9604(e)(3), Respondent shall provide access to the Site at reasonable times to EPA, EPA's contractors and oversight officials. Respondent shall use their best efforts to gain access to areas owned by or in the possession of someone

other than Respondent, as necessary to implement this UAO, as described in Paragraph 53. Such access shall be provided to EPA, its contractors and oversight officials. These individuals shall be permitted to move freely about the Site and appropriate off-Site areas in order to conduct actions that EPA determines to be necessary. EPA, its contractors and oversight officials shall notify Respondent of their presence on the Site by presenting their credentials.

52. Pursuant to this Section, any denial of access at reasonable times to any portion of the Site property where a request for access was made for the purposes of enforcing the requirements of RCRA, CERCLA or this UAO shall be construed as a violation of the terms of this UAO subject to the penalty provisions outlined in Section XVII (Penalties) of this UAO.
53. Access Agreements. Where action under this UAO is to be performed in areas owned by, or in possession of, someone other than Respondent, Respondent shall use best efforts to obtain all necessary access agreements within forty-five (45) days of approval of any Work Plan for which access is necessary or as otherwise specified, in writing, by the EPA Project Coordinators. Any such access agreement shall provide (i) for access by EPA and its representatives to move freely in order to conduct actions that EPA determines to be necessary and (ii) for such non-Respondent owner to refrain from using such property in any manner EPA determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Material, or interfere with or adversely affect the implementation, integrity, or protectiveness of the response action. The access agreement shall specify that Respondent is not EPA's representative with respect to any liabilities associated with activities to be performed. Respondent shall provide EPA's Project Coordinators with copies of any access agreements. Respondent shall immediately notify EPA if after using Respondent's best efforts it is unable to obtain such agreements within the time required. Best efforts as used in this Paragraph shall include, at a minimum, a certified letter from Respondent to the present owner of such property requesting access agreements to permit Respondent, EPA, and EPA's authorized representatives to enter such property, and the offer of payment of reasonable sums of money in consideration of granting access. Respondent shall, within ten (10) days of its receipt of a denial of access, submit in writing, a description of its efforts to obtain access. EPA may, at its discretion, assist Respondent in obtaining access. In the event EPA obtains access, Respondent shall undertake the Work on such property and Respondent shall reimburse EPA for all costs and attorney fees incurred by the United States in obtaining such access.
54. Respondent shall provide to EPA and the other Regulatory Agencies, upon request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as "Records") within Respondent's possession or control or that of its contractors or agents relating to activities at the Site or to the implementation of this UAO, including,

but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the Work. Respondent shall also make available to EPA and the other the Regulatory Agencies, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

55. Confidential Business Information. Respondent may assert a claim of business confidentiality covering part or all of any information submitted to EPA or any Regulatory Agency pursuant to the terms of this UAO under 40 C.F.R. § 2.203 in the manner described at 40 C.F.R. § 2.203(b) and substantiated with the information described at 40 C.F.R. § 2.204(e)(4). Information EPA determines is confidential will be given the protection specified in 40 C.F.R. Part 2. If no such claim or substantiation accompanies the information when it is submitted to EPA, it may be made available to the public or state or tribal officials by EPA without further notice to Respondent.
56. Privileged Documents. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondent asserts such a privilege in lieu of providing documents, Respondent shall have the burden of demonstrating to EPA by clear and convincing evidence that such privilege exists. Respondent shall provide EPA with the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the author's name and title; (4) the name and title of each addressee and recipient; (5) a description of the contents; and (6) the privilege asserted by Respondent. If a claim of privilege or protection applies only to a portion of a Record, Respondent shall provide to EPA or any Regulatory Agency in redacted form to mask the privileged or protected portion only. However, Respondent may make no claim of privilege, confidentiality or protection regarding: (1) any data regarding the Site, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological, or engineering data, or the portion of any other Record that evidences conditions at or around the Site; or (2) the portion of any Record that Respondent is required to create or generate pursuant to this UAO.
57. Notwithstanding any provision of this UAO, all Regulatory Agencies retain all of their information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

XV. COMPLIANCE WITH OTHER LAWS

58. Respondent shall perform all actions required pursuant to this UAO in accordance with all applicable local, state, and federal laws and regulations, including, but not limited to, the laws and regulations underlying the Environmental Obligations. Respondent shall obtain or cause its representatives to obtain all permits and approvals necessary under

such laws and regulations in a timely manner so as not to delay the Work required by this UAO.

XVI. RECORD RETENTION

59. Respondent shall preserve all documents and information, including raw data, relating to the Work performed under this UAO, or relating to any solid waste or hazardous waste found at the Site, for five (5) years following the termination of the UAO in accordance with Section XXV (Termination and Satisfaction).
60. Respondent shall acquire and retain copies of all documents that relate to the Site that are in the possession of its employees, agents, accountants, contractors or attorneys.
61. Respondent shall make available to EPA all employees and persons, including contractors, who engage in activities under this UAO, and ensure their cooperation with EPA with respect to this UAO.
62. After the five (5) year retention period and ninety (90) days before any document or information is destroyed, Respondent shall notify EPA that such documents and information are available to EPA for inspection, and on request, shall provide the originals or copies (at no extra cost) of such documents and information to EPA. Notification shall be in writing and shall reference the effective date, caption, and docket number of this UAO, and shall be addressed to EPA's Enforcement and Compliance Assurance Division Director. In addition, Respondent shall provide documents and information retained under this Section at any time before expiration of the five (5)-year retention period at the written request of EPA.
63. All documents pertaining to this UAO shall be stored by Respondent in a centralized location at the Site, or an alternative approved by Respondent to promote easy access by EPA or its representatives.

XVII. PENALTIES

64. Civil Penalties. Any willful violation, or failure or refusal to comply with any provision of this UAO may subject Respondent to civil penalties up to the maximum amount authorized by law pursuant to Section 7003(b) of RCRA, 42 U.S.C. § 6973(b) and/or pursuant to Section 106(b)(1) of CERCLA, 42 U.S.C. § 9606(b)(1), as applicable. As of the date of issuance of this UAO, the statutory maximum amount under Section 7003(b) of RCRA, 42 U.S.C. § 6973(b), is eighteen thousand, one hundred and thirty-nine dollars (\$18,139.00) per violation per day and the statutory maximum amount under Section 106(b)(1) of CERCLA, 42 U.S.C. § 9606(b)(1), is sixty-nine thousand, seven hundred and thirty-three dollars (\$69,733) per violation per day. This maximum amount may increase in the future, as EPA amends its civil penalty amounts through rulemaking pursuant to the 1990 Federal Civil Penalties Inflation Adjustment Act (Public Law 101-410, codified at

28 U.S.C. § 2461), as amended by the 2015 Federal Civil Penalties Inflation Adjustment Act Improvements Act (Section 701 of Public Law 114-74)). The maximum amount to be applied to this violation will be set as the most recent maximum amount set forth in 40 C.F.R. Section 19.4 as of the date that the U.S. District Court assesses any such penalty. In the event of such willful violation, or failure or refusal to comply, EPA may unilaterally carry out the actions required by this UAO, pursuant to any applicable authorities, and may seek judicial enforcement of this UAO. In addition, nothing in this UAO shall limit EPA's authority under Section XXI (Cost Estimates and Financial Assurance). Respondent may also be subject to punitive damages in an amount up to three (3) times the amount of any cost incurred by the United States as a result of such failure to comply, as provided in Section 107(c)(3) of CERCLA, 42 U.S.C. §9607(c)(3).

XVIII. RESERVATION OF RIGHTS

65. Notwithstanding any other provisions of this UAO, the United States retains all of its authority to take, direct, or order any and all actions necessary to protect public health or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants, or contaminants, or hazardous or solid waste or constituents of such wastes, on, at, or from the Site, including but not limited to the right to bring enforcement actions under RCRA, CERCLA, and any other applicable statutes or regulations.
66. EPA reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to Respondent's failure to comply with any of the requirements of this UAO, including without limitation the assessment of penalties under Section 7003 of RCRA, 42 U.S.C. § 6973 and/or any claims under Sections 106 of and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607, as applicable.
67. This UAO shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, claims, and/or authorities, civil or criminal, which EPA has under RCRA, CERCLA, or any other statutory, regulatory, or common law authority of the United States.
68. This UAO is not intended to be, nor shall it be construed to be, a permit. Compliance by Respondent with the terms of this UAO shall not relieve Respondent of its obligations to comply with RCRA, CERCLA or any other applicable local, state, tribal or federal laws and regulations.
69. Notwithstanding any other provision of this UAO, no action or decision by EPA pursuant to this UAO, including without limitation any action or decision by any authorized representative of EPA pursuant to this UAO, shall constitute final agency action giving rise to any right of judicial review prior to EPA's initiation of a judicial action to enforce this UAO, including an action for penalties or an action to compel Respondent's compliance with the terms and conditions of this UAO.

XIX. OTHER CLAIMS

70. By issuance of this UAO, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondent. Neither the United States nor EPA shall be deemed a party to any contract, agreement or other arrangement entered into by Respondent or its officers, directors, employees, agents, successors, assigns, heirs, trustees, receivers, contractors, or consultants in carrying out actions pursuant to this UAO.
71. Nothing in this UAO constitutes a satisfaction of or release from any claim or cause of action against Respondent or any person not a party to this UAO, for any liability such person may have under RCRA, CERCLA, other statutes, or common law, including but not limited to any claims of the United States under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.
72. Nothing in this UAO shall be deemed to constitute preauthorization of a claim within the meaning of Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2), or 40 C.F.R. § 300.700(d).

XX. INSURANCE

73. Prior to commencing the on-Site Work under this UAO, Respondent shall secure, and shall maintain in force for the duration of this UAO and for two (2) years after the completion of all activities required by this UAO, commercial general liability with limits of liability of \$1 million per occurrence, automobile liability insurance with limits of liability of \$1 million per accident, and umbrella liability insurance with limits of liability of \$5 million in excess of the required commercial general liability and automobile liability limits, naming EPA as an additional insured. Prior to commencement of the Work under this UAO, and annually thereafter on the anniversary of the Effective Date of this UAO, Respondent shall provide EPA with certificates of such insurance and a copy of each insurance policy. In addition, for the duration of the UAO, Respondent shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing Work on behalf of Respondent pursuant in furtherance of this UAO. If Respondent demonstrates by evidence satisfactory to EPA that its contractors and subcontractors maintain insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondent need provide only that portion of the insurance described above which is not maintained by the contractors and subcontractors.
74. For the duration of this UAO, Respondent shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of employer's liability insurance and worker's compensation insurance for all persons performing the Work on behalf of Respondent, in furtherance of this UAO.

75. Prior to commencing the Work under this UAO, Respondent shall certify to EPA that its contractors and subcontractors have obtained the required insurance.

XXI. COST ESTIMATES AND FINANCIAL ASSURANCE

76. Cost Estimates. Within thirty (30) days after the Effective Date of this UAO, Respondent shall submit to EPA a detailed written initial estimate, in current dollars, of the cost of hiring a third party to perform the Work described in Section VIII (Work to be Performed) (the “Cost Estimate”). A third party is a party who: (i) is neither a parent nor a subsidiary of Respondent and (ii) does not share a common parent or subsidiary with Respondent. The initial Cost Estimate must account for the total costs of the work activities described in Section VIII (Work to be Performed) for the entire period of this UAO, including any necessary long-term costs, such as operation and maintenance costs, monitoring costs, and institutional controls. The Cost Estimate must not incorporate any salvage value that may be realized from the sale of wastes, facility structures or equipment, land or other assets associated with the Site.
77. Concurrent with the submission of any Work Plan(s) for additional work required under Section XXIV (Additional Work), Respondent shall submit revised detailed written estimate(s), in current dollars, of the cost of hiring a third party to perform the Work.
78. Respondent must annually adjust the Cost Estimate(s) for inflation within thirty (30) days after the close of Respondent’s fiscal year until the Work required by this UAO is completed. In addition, Respondent must adjust the Cost Estimate if EPA determines that any additional work is required, pursuant to Section XXIV (Additional Work), or if any other conditions increase the cost of the Work to be performed under this UAO.
79. Respondent shall submit each Cost Estimate to EPA for review, pursuant to Section IX (EPA Approval of Deliverables).
80. Assurances of Financial Responsibility for Completing the Work. In order to ensure completion of the Work, Respondent shall secure financial assurance pursuant to the environmental programs in Paragraph 4 of this UAO, initially in the amount of the Cost Estimate (the “Estimated Cost of the Work”), within 30 days of EPA approval of the Cost Estimate. The financial assurance must be one or more of the mechanisms listed below, in a form substantially identical to the relevant sample documents available from EPA or under the “Financial Assurance - Orders” category on the Cleanup Enforcement Model Language and Sample Documents Database at <https://cfpub.epa.gov/compliance/models/>, and satisfactory to EPA.
- a. A trust fund: (1) established to ensure that funds will be available as and when needed for performance of the Work; (2) administered by a trustee that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency; and (3) governed by an agreement that

requires the trustee to make payments from the fund only when EPA Region IX advises the trustee in writing that: (i) payments are necessary to fulfill Respondent's obligations under the UAO; or (ii) funds held in trust are in excess of the funds that are necessary to complete the performance of Work in accordance with this UAO;

- b. A surety bond, issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury, guaranteeing payment or performance in accordance with Paragraph 84 (Access to Financial Assurance); or
 - c. An irrevocable letter of credit, issued by an entity that has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a federal or state agency, guaranteeing payment in accordance with Paragraph 84 (Access to Financial Assurance).
81. Standby Trust. If Respondent seeks to establish financial assurance by using a surety bond or a letter of credit, Respondent shall at the same time establish and thereafter maintain a standby trust fund, which must meet the requirements specified in Paragraph 80.a, and into which payments from the other financial assurance mechanism can be deposited if EPA so requires in accordance with the terms and conditions of the financial assurance mechanism and Paragraph 84 (Access to Financial Assurance). An originally signed duplicate of the standby trust agreement must be submitted, with the other financial mechanism, to EPA in accordance with Paragraph 82. Until the standby trust fund is funded pursuant to Paragraph 84 (Access to Financial Assurance), neither payments into the standby trust fund nor annual valuations are required.
82. Within thirty (30) days of EPA Approval of the Cost Estimate, Respondent shall submit to EPA proposed financial assurance mechanisms in draft form in accordance with Paragraph 80 (Assurances of Financial Responsibility for Completing the Work) for EPA's review. Within sixty (60) days after the Effective Date, or thirty (30) days after EPA's approval of the form and substance of Respondent's financial assurance, whichever is later, Respondent shall secure all executed and/or otherwise finalized mechanisms or other documents consistent with the EPA-approved form of financial assurance and shall submit such mechanisms and documents to:

Marie Ortesi
Mission Support Division (MSD-4)
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, California 94105
(415) 972-3710
Ortesi.Mari@epa.gov

With a copy to:

Laura Friedli
Office of Regional Counsel (ORC-3)
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, California 94105
(415) 972-3325
Friedli.Laura@epa.gov

83. Respondent shall diligently monitor the adequacy of the financial assurance. If Respondent becomes aware of any information indicating that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, Respondent shall notify EPA of such information within thirty (30) days. If EPA determines that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, EPA will notify Respondent of such determination. Respondent shall, within thirty (30) days after notifying EPA or receiving notice from EPA under this Paragraph, secure and submit to EPA for approval a proposal for a revised or alternative financial assurance mechanism that satisfies the requirements of this Section. Respondent shall follow the procedures of Paragraph 85 (Modification of Amount, Form, or Terms of Financial Assurance) in seeking approval of, and submitting documentation for, the revised or alternative financial assurance mechanism. Respondent's inability to secure financial assurance in accordance with this Section does not excuse performance of any other obligation under this UAO.
84. Access to Financial Assurance.
- a. If EPA determines that Respondent (1) has ceased implementation of any portion of the Work, (2) is seriously or repeatedly deficient or late in its performance of the Work, or (3) is implementing the Work in a manner that may cause an endangerment to human health or the environment, EPA may issue a written notice ("Performance Failure Notice") to both Respondent and the financial assurance provider regarding Respondent's failure to perform. Any Performance Failure Notice issued by EPA will specify the grounds upon which such notice was issued and will provide Respondent a period of ten (10) days within which to remedy the circumstances giving rise to EPA's issuance of such notice. If, after expiration of the ten (10)-day period specified in this Paragraph, Respondent has not remedied to EPA's satisfaction the circumstances giving rise to EPA's issuance of the relevant Performance Failure Notice, then, in accordance with any applicable financial assurance mechanism, EPA may at any time thereafter direct the financial assurance provider to immediately: (i) deposit any funds assured pursuant to this Section into the standby trust fund;

or (ii) arrange for performance of the Work in accordance with this UAO.

- b. If EPA is notified by the provider of a financial assurance mechanism that it intends to cancel the mechanism, and Respondent fails to provide an alternative financial assurance mechanism in accordance with this Section at least thirty (30) days prior to the cancellation date, EPA may, prior to cancellation, direct the financial assurance provider to deposit any funds guaranteed under such mechanism into the standby trust fund for use consistent with this Section.

- 85. Modification of Amount, Form, or Terms of Financial Assurance. Respondent may submit, on any anniversary of the Effective Date or following Respondent's request for, and EPA's approval of, another date, a request to reduce the amount, or change the form or terms, of the financial assurance mechanism. Any such request must be submitted to the EPA individual(s) referenced in Paragraph 82, and must include an estimate of the cost of the remaining Work, an explanation of the bases for the cost calculation, a description of the proposed changes, if any, to the form or terms of the financial assurance, and any newly proposed financial assurance documentation in accordance with the requirements of Paragraphs 80 (Assurances of Financial Responsibility for Completing the Work) and 81 (Standby Trust). EPA will notify Respondent of its decision to approve or disapprove a requested reduction or change. Respondent may reduce the amount or change the form or terms of the financial assurance mechanism only in accordance with EPA's approval. Within thirty (30) days after receipt of EPA's approval of the requested modifications pursuant to this Paragraph, Respondent shall submit to the EPA individual(s) referenced in Paragraph 82 all executed and/or otherwise finalized documentation relating to the amended, reduced, or alternative financial assurance mechanism. Upon EPA's approval, the Estimated Cost of the Work shall be deemed to be the estimate of the cost of the remaining Work in the approved proposal.
- 86. Release, Cancellation, or Discontinuation of Financial Assurance. Respondent may release, cancel, or discontinue any financial assurance provided under this Section only: (a) after receipt of documentation issued by EPA certifying completion of the Work; or (b) in accordance with EPA's written approval of such release, cancellation, or discontinuation.

XXII. INDEMNIFICATION

- 87. Respondent shall indemnify, save and hold harmless the United States, its officials, agents, contractors, employees, and representatives from any and all claims or causes of action: (a) arising from, or on account of, acts or omissions of Respondent, Respondent's directors, officers, employees, agents, successors, assigns, heirs, trustees, receivers, contractors, or consultants in carrying out actions pursuant to this UAO; and (b) for damages or reimbursement arising from or on account of any contract,

agreement, or arrangement between Respondent and any persons for performance of the Work on or relating to the Site, including claims on account of construction delays.

XXIII. DELAY IN PERFORMANCE

88. Respondent shall notify EPA of any delay or anticipated delay in performing any requirement of this UAO. Such notification shall be made by telephone and email to the EPA Project Coordinators within forty-eight (48) hours after Respondent first knew or should have known that a delay might occur. Respondent shall adopt all reasonable measures to avoid or minimize any such delay. Within seven (7) days after notifying EPA by telephone and email, Respondent shall provide to EPA written notification fully describing the nature of the delay, the anticipated duration of the delay, any justification for the delay, all actions taken or to be taken to prevent or minimize the delay or the effect of the delay, a schedule for implementation of any measures to be taken to mitigate the effect of the delay, and any reason why Respondent should not be held strictly accountable for failing to comply with any relevant requirements of this UAO. Increased costs or expenses associated with implementation of the activities called for in this UAO is not a justification for any delay in performance.
89. Any delay in performance of this UAO that, in EPA's judgment, is not properly justified by Respondent under the terms of Paragraph 88 shall be considered a violation of this UAO. Any delay in performance of this UAO shall not affect Respondent's obligations to fully perform all obligations under the terms and conditions of this UAO.

XXIV. ADDITIONAL WORK

90. EPA may determine, or Respondent may propose, that certain tasks are necessary in addition to or in lieu of the tasks included in any EPA-approved Work Plan when such additional work is necessary to meet the objectives set forth in this UAO. EPA may determine that Respondent shall perform any additional work and EPA will specify, in writing, the basis for its determination that any additional work is necessary. Within five (5) days after the receipt of such determination, Respondent shall have the opportunity to meet or confer with EPA to discuss any additional work. Respondent shall submit for EPA approval a Work Plan for any additional work, which Work Plan shall conform to the applicable requirements of Section VIII (Work to be Performed). Such Work Plan shall be submitted within fifteen (15) days of Respondent's receipt of EPA's determination that any additional work is necessary, or according to an alternative schedule established by EPA. On approval of a Work Plan for any additional work, Respondent shall implement the Work Plan for any additional work in accordance with the schedule and provisions contained therein. The Work Plan for any additional work shall be incorporated by reference into this UAO.

XXV. TERMINATION AND SATISFACTION

91. When EPA determines, after EPA’s review of the final report, that all Work has been fully performed in accordance with this UAO, with the exception of any continuing obligations required by this UAO, including Respondent’s obligations to comply with Sections XIV (Sampling, Access and Data Availability); XVI (Record Retention); XVIII (Reservation of Rights); and XXII (Indemnification) of this UAO, EPA will provide notice to Respondent. If EPA determines that any Work has not been completed in accordance with this UAO, EPA will notify Respondent, provide a list of the deficiencies, and require that Respondent modify the Work Plan, if appropriate, in order to correct such deficiencies in the Work within thirty (30) days after receipt of the EPA notice. The modified Work Plan shall include a schedule for correcting such deficiencies. Within five (5) days after receipt of written approval of the modified Work Plan, Respondent shall commence the implementation of the modified and approved Work Plan and, upon completion of the Work pursuant to the modified and approved Work Plan, shall submit a modified Final Report in accordance with the EPA notice. Failure by Respondent to implement the approved modified Work Plan shall be a violation of this UAO.

XXVI. SEVERABILITY

92. If a court issues an order that invalidates any provision of this UAO or finds that Respondent has sufficient cause not to comply with one or more provisions of this UAO, Respondent shall remain bound to comply with all provisions of this UAO not invalidated or determined to be subject to a sufficient cause defense by the court’s order.

XXVII. EFFECTIVE DATE

93. This UAO is deemed effective within five (5) days of receipt (the “Effective Date”), unless (i) a conference is requested, or notice is given that written materials will be submitted in lieu of a conference as provided in Section XXVIII (Opportunity to Confer) and (ii) EPA and Respondent mutually agree to modify the Effective Date.

XXVIII. OPPORTUNITY TO CONFER

94. Within two (2) days of receipt of this UAO, Respondent may, in writing, (a) request a conference with EPA to discuss this UAO, including its applicability, the factual findings and the determinations upon which it is based, the appropriateness of any actions Respondent is ordered to take, or any other relevant and material issues or contentions that Respondent may have regarding this UAO, or (b) notify EPA that it intends to submit written comments or a statement of position in lieu of requesting a conference.
95. At any conference held pursuant to Respondent’s request, Respondent may appear in person, or be represented by an attorney or other representative. If Respondent desires such a conference, Respondent shall contact Laura Friedli, EPA Attorney Advisor, at (415) 972-3325.

96. The purpose and scope of any such conference held pursuant to this UAO shall be limited to issues involving the implementation of the Work required by this UAO and the extent to which Respondent intends to comply with this UAO. If such a conference is held, Respondent may present any evidence, arguments or comments regarding this UAO, its applicability, any factual determinations on which the UAO is based, the appropriateness of any action that Respondent is ordered to take, or any other relevant and material issue. Any such evidence, arguments or comments should be reduced to writing and submitted to EPA within three (3) days following the conference. This conference is not an evidentiary hearing and does not constitute a proceeding to challenge this UAO. It does not give Respondent a right to seek review of this UAO, or to seek resolution of potential liability, and no official record of the conference will be made. If no conference is requested, any such evidence, arguments or comments must be submitted in writing within three (3) days following the Effective Date of this UAO. Any such writing should be directed to Laura Friedli, at the following address:

Environmental Protection Agency
75 Hawthorne Street, ORC-3
San Francisco, CA 94105
(415) 972-3325
Friedli.Laura@epa.gov

97. Respondent is hereby placed on notice that EPA will take any action that may be necessary in the opinion of EPA for the protection of public health and welfare and the environment.

XXIX. NOTICE OF INTENT TO COMPLY

98. Respondent shall, on or before the Effective Date of this UAO, provide written notice to EPA of Respondent's irrevocable intent to comply with this UAO. Respondent's written notice shall describe, using facts that exist on or prior to the Effective Date, any "sufficient cause" defense asserted by Respondent under Sections 106(b) and 107(c)(3) of CERCLA, 42 U.S.C. §§ 9606(b) and 9607(c)(3). The absence of a response by EPA to the notice required by this Paragraph shall not be deemed to be acceptance of Respondent's assertions. Failure of Respondent to provide such notice of intent to comply within this time period shall, as of the Effective Date, be treated as a violation of this UAO by Respondent. Failure to respond, or failure to agree to comply with this UAO, shall be deemed a refusal to comply with this UAO.

It is ORDERED this 21 day February, 2024

By: /s/
Amy C. Miller-Bowen

Enforcement and Compliance Assurance Division Director
U.S. Environmental Protection Agency, Region 9

By: _____/s/_____
Michael Montgomery
Superfund and Emergency Management Division Director
U.S. Environmental Protection Agency, Region 9

Attachment A – Map of Landfill

EXHIBIT 10



LOS ANGELES COUNTY DEPARTMENT OF PUBLIC HEALTH
SOLID WASTE MANAGEMENT PROGRAM
ACTING AS THE LOCAL ENFORCEMENT AGENCY (LEA)
5050 COMMERCE DRIVE, BALDWIN PARK, CA 91706

IN THE MATTER OF:

CHIQUITA CANYON SANITARY LANDFILL

29201 HENRY MAYO DRIVE

CASTAIC, CA 91384

APN: 3271-002-011, 3271-002-013, 3271-002-019,

3271-002-036, 3271-002-039, 3271-005-034

SWIS# 19-AA-0052

OWNER/OPERATOR

CHIQUITA CANYON, LLC (RESPONDENT)

29201 HENRY MAYO DRIVE

CASTAIC, CA 91384

BY CERTIFIED MAIL AND ELECTRONIC COPY

CERTIFIED MAIL: 91 7199 9991 7037 9753 6218

COMPLIANCE ORDER

PUBLIC RESOURCES CODE SECTIONS

43209, 44106, 45000, 45005, 45011, 45014,

45017, 45023; TITLE 27 OF THE CALIFORNIA

CODE OF REGULATIONS (27 CCR),

SECTIONS, 20750, AND 20921; AND TITLE 14

OF THE CALIFORNIA CODE OF

REGULATIONS (14 CCR), SECTIONS 18304

AND 18304.1, 18304.3, 18365

DATE: June 6, 2024

TO: CHIQUITA CANYON, LLC

YOU ARE HEREBY ORDERED TO:

TAKE ALL ACTIONS AND ABIDE BY ALL OTHER ORDERS CONTAINED HEREIN

AT THE CHIQUITA CANYON LANDFILL EFFECTIVE IMMEDIATELY.

1.0 PLEASE TAKE NOTICE:

1.1 The Los Angeles County Department of Public Health, Solid Waste Management Program, acting as the Local Enforcement Agency (LEA), is authorized by Division 30 of the

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Public Resources Code (PRC), §§ 43209 and 45000, and Title 14 of the California Code of Regulations (14 CCR), to enforce applicable solid waste regulations within the County of Los Angeles; and,

1.2 Division 30 Part 5 of the PRC and 14 CCR §§ 18304 and 18304.1 authorize the LEA to issue enforcement orders for violations of the PRC and regulations adopted pursuant to Division 30 of the PRC; and

1.3 Chiquita Canyon Sanitary Landfill (Site) is a permitted sanitary landfill located on parcel APNs 3271-002-011, -013, -019, -036, -039, and 3271-005-034 with an address of 29201 Henry Mayo Drive, Castaic, California, 91384, in the County of Los Angeles, and identified by Solid Waste Information System (SWIS) No. 19-AA-0052; and

1.4 Respondent, Chiquita Canyon, LLC, (CCL), is the operator and Responsible Party (RP) for noncompliance with state minimum standards. Specifically, 27 CCR, Sections 20921 and 20750 have been noted monthly on LEA inspection reports to date beginning September 1, 2023, and November 28, 2023, respectively, and are described in the paragraphs below.

2.0 STATMENT OF FACTS PERTAINING TO 27 CCR SECTION 20750:

2.1 On August 10, 2023, the LEA requested the California Department of Resources, Recycling and Recovery (CalRecycle) to provide technical expertise and assistance in determining root cause and mitigation strategies for multiple issues identified at the Site by the LEA and other regulatory agencies, such as elevated well temperatures, increased landfill gas (LFG) emissions (odor), and unusual landfill settlement.¹

¹ CalRecycle provides comments to the LEA as assistance to support the program carrying out its responsibilities on permitted disposal sites. The final determination as to the comments provided to the responsible party is within the sole purview of the LEA, acting within the parameters of its discretion, in accordance with its vested authority under its certification as defined in 14 CCR, Division 7, 27 CCR, Division 2, Subdivision 1 (Section 20005 et seq.), and Division 30 of the PRC.

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2.2 CalRecycle issued a letter dated October 16, 2023 (October 16, 2023 CalRecycle Letter) to the LEA containing its review of the conditions that are causing the issues at the Site. CalRecycle conducted a comprehensive review of 18 months of Site records, and LFG data in the impacted area and around the general vicinity of the impacted area. The review focused on the Site's carbon monoxide concentrations, recent LFG temperatures, LFG control system operation, and other operational factors. The review determined that the Site sustained conditions over the past 18 months that include, but are not limited, to:

- Cover integrity issues;
- Increased temperatures and pressures in the LFG control systems and waste mass;
- Unusual landfill settlement;
- A heating/smoldering event that is expanding in size and intensity.

2.3 CalRecycle concluded that "conditions at CCL are causing additional pressure, odors, elevated leachate temperatures, and damage to the gas extraction system." To reduce the odors and better define the reaction, CalRecycle recommended 15 mitigation actions as part of the review.

2.4 On October 17, 2023, the LEA issued a letter (October 17, 2023 LEA Letter) requesting that CCL provide a written response and timeline to address the recent conditions sustained by CCL in the prior 18 months and the 15 recommended corrective and mitigation actions from the October 16, 2023 CalRecycle Letter by October 20, 2023.

2.5 CCL responded on October 20, 2023 (October 20, 2023 CCL Response) as instructed by the LEA. CCL addressed the 15 recommended mitigation actions, many of which according to CCL, were included in the South Coast Air Quality Management District's (SCAQMD) Stipulated Order for Abatement (SOFA).

2.6 The LEA requested CalRecycle's technical review of the October 20, 2023 CCL Response. As part of the review, CalRecycle visited the Site on November 2, 2023. Staff from the LEA, SCAQMD, Los Angeles Regional Water Quality Control Board (LARWQCB), Department of Toxic Substances Control (DTSC), and the United States Environmental Protection Agency (USEPA) toured the Site with CCL staff.



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2.7 On November 14, 2023, CalRecycle issued a letter (November 14, 2023 CalRecycle Letter) to the LEA based on the November 2, 2023 Site visit and the additional information provided in the October 20, 2023 CCL Response. CalRecycle's letter provided a cause analysis, comments to CCL's response to recommended mitigation actions (2, 8, 9 and 13) and further recommendations. Regarding recommended mitigation action 2, CalRecycle concluded that the current intermediate cover should not be viewed as adequate to minimize odors.

2.8 On November 21, 2023, the LEA issued a letter (November 21, 2023 LEA Letter) requiring that CCL perform four mitigation measures (Mitigation Measure 1A, 1B, 2A, 2B, 3 and 4) recommended in the November 14, 2023 CalRecycle Letter and October 16, 2023 CalRecycle Letter. The LEA directed that CCL provide a written response by Wednesday, December 6, 2023, and submit the required plan, data, and report by the due dates indicated in the letter.

2.9 The four mitigation measures listed in the November 21, 2023 LEA Letter that are required to correct the violation of 27 CCR § 20750 are described below.

Mitigation Measure 1 A & 1B – Soil Reaction Break/Barrier

2.10 CCL must provide a plan to construct a soil reaction break/barrier at a predesignated area(s) if the reaction reaches a determined action line. The plan is due to the LEA for approval no later than two weeks after installing temperature monitoring devices.

A. Develop a soil reaction break/barrier plan and propose a set of criteria that would require CCL to install a soil reaction break/barrier between the reaction and operational areas of the landfill. (Mitigation Measure 1A)

B. To obtain necessary data to determine the action line, CCL needs to collect data regarding intensity, depth, speed and direction of the reaction. It is imperative that CCL installs temperature monitoring devices by January 8, 2024. (Mitigation Measure 1B)

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Mitigation Measure 2 A & 2B - Cover

2.11 Because of the ongoing reaction, the cover that is currently in place is not adequate and not performing to the standards to maintain the site in reasonable repair.

A. Place and compact a minimum cover of 24 inches of 1×10^{-6} low permeability soil in and around the reaction settlement area and any well showing signs of a reaction by December 14, 2023. (Mitigation Measure 2A)

B. Develop a written plan that includes documentation and tracking of the fissures, settlement and tension cracks in the soil cover for LEA review and approval by December 6, 2023. The written plan needs to include a photo log of the fissure location including length and severity. Upon LEA approval, CCL must submit a weekly report to the LEA by each Tuesday. (Mitigation Measure 2B)

Mitigation Measure 3 - Slope Stability Analysis

2.12 Given the prior slope instability on the western slope near the leachate outbreak, CCL shall perform a slope stability analysis in the same area for LEA review, as saturated waste has very low shear strength. Submit a workplan with a timeline for LEA review and approval by December 14, 2023.

Mitigation Measure 4 – Manufacturer Maximum Design Specifications

2.13 CCL needs to collect temperatures in and around the reaction area to meet the manufacturer's temperature design specification/recommendations to ensure that the French drain does not fail due to elevated temperature of the leachate soon after installation, leaving leachate seepage without control at the site. This additional step is necessary because of the ongoing reaction and to ensure that the public does not come into contact with leachate.

2.14 On November 28, 2023, the LEA conducted a periodic inspection that noted a violation of 27 CCR § 20750-Site Maintenance and referred to the November 21, 2023 LEA Letter's four mitigation measures as a means to assist with correcting the violation. The LEA periodic inspection reports dated November 28, December 19, 2023, January 17, February 7,

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March 26, and April 30, 2024 have also noted the violation of 27 CCR § 20750. The violation noted on the report is described below.

Pursuant to 27 CCR § 20750, the operator shall implement a preventative maintenance program to monitor and promptly repair or correct defective conditions with respect to requirements of the CIWMB [California Integrated Waste Management Board, currently CalRecycle] standards, and conditions established by the EA [Enforcement Agency (LEA)]. All other aspects of the disposal site shall be kept in a state of reasonable repair.

Due to leachate outbreaks and stability issues with leachate saturated slope and waste, the issues with high temperatures, LFG collection, excessive leachate production, and unusual and large-scale settlement, the LEA required CCL to complete the following actions listed in the November 21, 2023 LEA Letter, as recommended by CalRecycle after the site inspection on November 2, 2023 and records review.

CCL's compliance status pertaining to 27 CCR § 20750 is subcategorized by mitigation measure and discussed below.

Mitigation Measure 1 A – Soil Reaction Break/Barrier Plan

2.15 On December 6, 2023, the LEA received a letter from CCL (December 6, 2023 CCL Response) in response to the November 21, 2023 LEA Letter. CCL responded to Mitigation Measure 1A by stating they would prepare a soil reaction break/barrier plan and propose a set of criteria that would require CCL to install the break/barrier by the LEA-provided deadline. CCL also stated that it does not believe that such a break/barrier is necessary or feasible, however, CCL did not provide any data to support CCL's belief.

2.16 On April 5, 2024, the LEA issued a letter to CCL (April 5, 2024 LEA Letter) stating the TMP and LFG collection well data, specifically carbon monoxide (CO) and hydrogen (H₂) are imperative for determining an action line, in which, if the reaction reaches a predesignated criteria then it would trigger implementation of an approved Soil Reaction

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Break/Barrier Plan. Directives 1 and 2 pertain to the installation of Mitigation Measure 1B and are discussed in the corresponding section. Directives 3 through 6 apply to the Soil Reaction Break/Barrier Plan (Mitigation Measure 1A) and are described below.

Directive 3: Provide waste photographs, boring logs and temperature logs to the LEA by April 12, 2024, for all LFG collection wells installed since June 2023.

Directive 4: Submit LFG data for all gas collection wells in the reaction area and wells 200 feet outside of the reaction area to the LEA by April 12, 2024.

Directive 5: Submit CO and H₂ readings for all gas collection wells in the reaction area and wells 200 feet outside of the reaction area to establish a baseline using Method ASTM D1946 in summa cans by May 6, 2024.

Directive 6: Submit monthly CO and H₂ data from a set of gas wells selected by the LEA after the baseline sampling is completed and recorded on a site map. Submit the lab data for all LFG data. Once a set of wells are selected, monthly LFG data shall be collected and submitted to the LEA, including a discussion of the LFG data and graphic showing CO and H₂ trends over time.

2.17 The April 5, 2024 LEA Letter provided a new deadline to submit the Soil Reaction Break/Barrier Plan, at least 10 days after gathering all the necessary data, rather than two weeks after the installation of the TMPs as per the November 21, 2023 LEA Letter. Lastly, the letter also stated that as an alternative option, CCL may submit a study to the LEA to assure the reaction is no longer a concern to public health, safety and the environment, if CCL chose to do so.

2.18 On April 12, 2024, the LEA received a response from CCL (April 12, 2024 CCL Response) to Directive 3 and 4 of the April 5, 2024 LEA Letter, and a Soil Reaction Break/Barrier Plan dated March 27, 2024 (March 27, 2024 Plan). The April 12, 2024 CCL Response is pending LEA review.

2.19 The LEA determined that the March 27, 2024 Plan was deficient and did not adequately address Mitigation Measure 1A requirements as described in the November 21, 2023 LEA Letter and the April 5, 2023 LEA Letter, and it was therefore rejected by the LEA in a

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letter dated May 3, 2024 (May 3, 2024 LEA Letter).

2.20 Prior to issuance of the May 3, 2024 LEA Letter, the LEA held a virtual meeting with CCL and CalRecycle on April 23, 2024, to discuss the need for a revised plan from CCL to adequately address the construction of a soil reaction break/barrier. The *CCL Barrier Discussion* presentation and *Isolation Break Criteria Example* document presented by CalRecycle at the meeting were provided to CCL via email on the same day.

2.21 As per the May 3, 2024 LEA Letter, CCL is required to submit a revised Soil Reaction Break/Barrier Plan to the LEA for review and approval within 10 days after gathering necessary data from the TMPs and LFG collection wells (refer to the April 5, 2024 LEA Letter). The data from the TMPs and LFG collection wells should be used to draft the revised plan and address the following:

1. Installation of an air/soil break that separates the waste with either an inert material or air.

2. Investigate how each cell or phase was constructed and examine if soil breaks between cells/phases can be exploited. The investigation should include a review of where haul roads were constructed to determine if the inert roads can also be used as fuel breaks. Information from the investigation should be used to develop where containment breaks should be placed.

3. Propose a set of criteria for the primary and secondary engagement lines and the type of reaction breaks/barriers and/or mitigations. These criteria shall be based on temperature, CO, and possibly settlement rate. The primary engagement lines should be designed to prevent the reaction from spreading into the main fill which is close to the reaction. The secondary line should prevent the reaction from entering the eastern and southern fill areas at the toe of the slope.

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4. Construction of reaction breaks in the main 160-acre fill area for the reaction of the engagement lines. The reaction break plans should include timelines and method of construction. The timelines and engagement lines should match.

5. Include the construction of reaction breaks/barrier between Canyon C, A, D, and Cell 5 in the event the reaction reaches the secondary engagement lines.

6. Use best available technology, such as grout injection, to slow or contain reaction movement to the south and east.

7. Description of the criteria that will mandate the temporary suspension of placing new waste.

CCL may submit an alternative plan to the LEA for review, only if such plan is adequately supported by substantive data and studies and provides assurances to the LEA that the reaction is no longer a threat to public health, safety and the environment.

2.22 On May 8, 2024, the LEA received the CO and H₂ data (May 8, 2024 Data) in response to Directive 5 of the April 5, 2024 LEA Letter which required CCL to submit CO and H₂ readings for all gas collection wells in the reaction area and wells 200 feet outside the reaction area by May 6, 2024.

2.23 On May 28, 2024, the LEA issued a response to CCL (May 28, 2024 LEA Letter) stating that the May 8, 2024 Data submittal is inadequate due to missing information. CCL was directed to resubmit the data as a standalone report with the gas data presented in a table, a summary of the sampling, including a map showing the reaction area as it is currently defined, description of the gas sampling performed, Quality Assurance/Quality Control (QA/QC) data (e.g., field and laboratory QA/QC samples and data including any flags), and proposed holding times, etc., with the signature of qualified person or licensed engineer by June 6, 2024.

Mitigation Measure 1B – Temperature Monitoring Probes

2.24 In the December 6, 2023 CCL Response to the November 21, 2023 LEA Letter, CCL

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agreed to install TMPs with a request for further clarification from the LEA on this requirement.

2.25 In order to collect data regarding intensity, depth, speed and direction of the reaction, the LEA required CCL to install TMPs. The November 21, 2023 LEA Letter provided recommended locations for the installation of 21 TMPs by January 8, 2024.

2.26 On December 6, 2023, the LEA, CalRecycle and CCL staff met to discuss TMPs per CCL's December 1, 2023 email request. CCL requested further clarification regarding probe locations, probe depths, and probe type.

2.27 On December 20, 2023, the LEA received the Landfill Reaction Area Temperature Monitoring Plan (December 20, 2023 Plan) from CCL for the installation of 20 TMPs and notification that the deadline of January 8, 2024 was not attainable. CCL proposed a new deadline of March 2024 to complete the installation based on availability of the materials, equipment, and the contractor.

2.28 On December 22, 2023, the LEA issued a letter (December 22, 2023 LEA Letter) accepting with conditions the December 20, 2023 Plan with conditions. Conditions included the submittal of design specifications and a typical design detail drawing of the TMPs, with specified probe depths, by February 15, 2024.

2.29 On January 2, 2024, the LEA received a letter from CCL (January 2, 2024 CCL Letter) with design specifications and design detail drawings for the TMPs. CCL agreed to meet the February 15, 2024 deadline, barring weather, material deliveries, health and safety, and permitting delays. CCL confirmed they would provide the LEA with weekly updates on the status of material deliveries and installation schedule.

2.30 On January 10, 2024 a virtual meeting was held between the CCL, the LEA and CalRecycle for a technical discussion. The LEA directed CCL to submit revised design specifications and design detail drawings for the TMPs to include the required depth intervals.

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2.31 On January 17, 2024, the LEA received a letter from CCL (January 17, 2024 CCL Letter) with a revised design specification and design detail drawings and depth intervals for the TMPs that were discussed during the January 10, 2024 meeting.

2.32 On January 19, 2024, CCL, the LEA, and CalRecycle met and discussed the telemetry system that will be used to record temperature data.

2.33 On January 29, 2024, the LEA issued a letter (January 29, 2024 LEA Letter) accepting the revised design specification and design detailed drawings for the TMPs. The LEA approved the latest schedule to install the TMPs by February 29, 2024 based on the January 11, 2024 weekly update from CCL regarding the material deliveries and revised installation schedule. In addition, as per the meeting on January 19, 2024, the LEA specified due date of February 8, 2024 for CCL to submit the specifications of the telemetry system that will be used to record temperature data.

2.34 On February 26, 2024, the LEA issued a letter to CCL (February 26, 2024 LEA Letter) regarding delays that CCL reported in the weekly status updates received through February 22, 2024. CCL stated that due to delays caused by rain events and for safety reasons, the completion time for drilling for TMP installation was estimated to be an additional 6-7 weeks. The LEA directed CCL to provide a written response by February 29, 2024 (current due date for completion of the TMP installation) that includes an updated construction schedule that details an accurate timeline for the installation of the TMPs, weekly goals for the installation, and what efforts and resources (such as additional equipment and workforce) are being implemented to expedite the work and meet the proposed timelines.

2.35 On February 29, 2024, the LEA received a response from CCL (February 29, 2024 CCL Letter) providing justification for delays and a new schedule for the installation of the TMPs. Due to weather conditions or related safety concerns, the anticipated completion date was extended from February 29, 2024 to April 4, 2024, weather permitting.

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2.36 On March 4, 2024, the LEA, CalRecycle and CCL staff met virtually to discuss issues with TMP installation to planned depths. The LEA and CalRecycle advised that CCL should install to the depth allowable and focus on getting the TMPs installed so that CCL can begin gathering data. The LEA also pointed out a typographical error and the lack of an official time extension request in the February 29, 2024 CCL Letter.

2.37 On March 4, 2024, the LEA received a revised response letter (March 4, 2024 CCL Letter) officially requesting modification to the timeline for TMP installation and correcting the typographical error noted in para. 2.36.

2.38 March 20, 2024, the LEA issued an approval (March 20, 2024 LEA Approval) to the modified schedule (March 4, 2024 CCL Letter) and April 4, 2024 completion date for the installation of TMPs, and directed CCL to continue to provide weekly updates on the progress of the installation of TMPs including any delays due to rain events or other special occurrence that may affect the modified schedule.

2.39 On March 20, 2024, the LEA issued a letter to CCL (March 20, 2024 LEA Letter) in response to a weekly update from CCL regarding the TMP installation received on March 14, 2024. The letter addressed the issues brought up by CCL that the well bores were saturated to the point that all five probes installed from March 11, 2024 through March 14, 2024 did not reach the proposed depth. The LEA determined that the adjustment to the remaining TMPs is necessary and required CCL to submit a report for the probe installation to the LEA by March 28, 2024 that would include: 1) an updated map showing the settlement area overlayed with the completed drilling locations, completed and proposed depths and remaining/planned drilling locations (if applicable), 2) drilling logs and 3) temperature logs of temperatures taken during drilling.

2.40 On March 28, 2024, LEA received the CCL report (March 28, 2024 Report) that stated the issues with achieving the proposed depths and a confirmation that sixteen (16) probes had been installed and were operational.

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2.41 On April 5, 2024, the LEA issued a letter (April 5, 2024 LEA Letter) directing CCL to: 1) relocate the planned installation for well TP-16 to an area outside of the reaction where drilling to the proposed depth may be feasible, and 2) submit a final construction report within 5 days of completion of the installation of all TMPs.

2.42 On April 10, 2024 virtual meeting was held between CCL, LEA and CalRecycle to discuss the progress of TMPs installation, the relocation of TMP TP-16 and TP-04, and the need for a formal extension request with justification for not meeting the April 4, 2024 deadline to complete installation of TMPs.

2.43 On April 12, 2024, LEA received the CCL's response (April 12, 2024 CCL Response) that addressed the two directives related to TMPs in the April 5, 2024 LEA Letter as well as items discussed during the April 10, 2024 meeting. CCL confirmed that it would submit weekly memorandum with temperature readings and analysis of those readings along with a summary and temperature graph of all TMPs to plot the trends of each TMP once the final construction report was completed.

2.44 On April 16, 2024, LEA received a letter from CCL (April 16, 2024 CCL Letter) to memorialize the April 10, 2024 virtual meeting and to request a time extension for the installation of TMPs to April 26, 2024 with justification that drilling operations for TMP installation were delayed due to saturated soil conditions from frequent rain events over the past two months and safety related concerns.

2.45 On April 24, 2024, LEA issued a letter to CCL (April 24, 2024 LEA Letter) accepting CCL's proposed timelines for TMP installation.

2.46 On May 3, 2024, the LEA received the Final Construction Report, 2024 Temperature Monitoring Probe Installation (May 3, 2024 CQA Report) as per Directive 2 of the April 5, 2024 LEA Letter.

2.47 On May 29, 2024, the LEA issued a response letter to the CQA Report (May 29, 2024 LEA Response) directing CCL to resubmit a CQA to the LEA by June 6, 2024 with a site



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map of the TMP's location, completion depth at each well, the reaction area as it is defined as of May 1, 2024, and a method (web-portal) for CCL to provide real-time access to temperature data to the LEA and CalRecycle. The temperature data included in the revised CQA Report was required to include the maximum weekly temperature recorded at each TMP, instead of or in addition to average weekly temperatures. Finally, the LEA advised that the revised CQA Report should include a signature and stamp of a licensed engineer to show all work can be clearly attributed to the licensee(s) in responsible charge of the work.

2.48 The May 29, 2024 LEA Response also addressed the weekly TMP reports and directed CCL to revise the weekly TMP reports with the weekly temperature readings to include graphs that show the maximum temperature recorded at each TMP instead of weekly average, as the criteria to implement a containment strategy must be based on maximum temperature readings and not an average temperature. The weekly TMP reports were also required to include the following additional details: a reaction map with the maximum observed temperature at each well with depth, a narrative describing any anomalies, outliers, data gaps, or malfunctions. The narrative must describe any temperature increases of 20°F or greater within 48 hours as stated in the April 5, 2024 LEA Letter and include an increase of 10°F in a week. The LEA advised that the weekly TMP reports should be a standalone document, and on the last weekly report for the month, CCL is directed to include a map that shows each TMP with color-coded observations based on the maximum observed temperature. CCL was required to submit revised weekly TMP reports beginning the week of June 2, 2024.

2.49 Additionally, the May 29, 2024 LEA Response specifically addressed the Weekly Cover Report dated May 14, 2024 that showed the reaction is extending south into areas outside the previously defined reaction area. To accurately track the reaction's progress, CCL was directed to install three specifically located temperature probes by June 12, 2024. CCL was reminded that while the settlement rate indicator is low, the reaction has advanced which



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requires the development of a plan to implement a containment strategy (Mitigation Measure 1A Soil Reaction Break/Barrier Plan).

2.50 A meeting was held on May 31, 2024 to discuss the directive in the May 29, 2024 LEA Response to add three TMPs. CCL stated that the settlement was misinterpreted in the Weekly Cover Report due to construction taking place in the area that showed settlement. Furthermore, CCL stated that there are TMPs near the subject area, planned LFG well installation in that area, and data that supports the reaction area is not expanding. LEA instructed CCL to reply by June 12, 2024, with installation plan, an alternate proposal or justification for no action based on information shared in meeting.

Mitigation Measure 2A – Geosynthetic Cover

2.51 In the December 6, 2023 CCL Response to the November 21, 2023 LEA Letter, CCL noted several concerns regarding the placement of soil and stated that an alternative proposal would be submitted to the LEA by December 8, 2023.

2.52 On December 8, 2023, the LEA received a Memorandum from CCL (December 8, 2023 CCL Memorandum) responding to the November 21, 2023 LEA Letter regarding the Mitigation Measure 2A requirement. The December 8, 2023 CCL Memorandum provided a description and timeline for two specific proposed alternatives to the additional cover as well as for the 24-inches of low permeability soil cover in and around the Reaction Settlement Area and any well showing signs of reaction as required by Mitigation Measure 2A: 1) Low Permeability Soil Cover, 2) Evaporative Soil Cover or 3) 12-mil Dura-Skrim Geosynthetic Cover (12-mil Cover).

2.53 On December 14, 2023, the LEA issued a response (December 14, 2023 LEA Letter) to the December 8, 2023 CCL Memorandum. The LEA advised CCL that although the placement of low permeability soil would be the most effective option to address the inadequacy of the existing cover over the reaction area, as it would prevent surface emissions of LFG while

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reducing oxygen infiltration. Because this option may take 12 weeks to implement which is the longest timeframe out of the three alternatives provided, it was no longer considered. Next, the proposed alternative to use an evaporative soil cover option using high permeability soil was deemed to be unacceptable as it would allow air, water, and LFG to migrate through the cover. CCL's proposed installation of the 12-mil Cover was the alternative that had the quickest installation timeline, within 5 weeks, and was an adequate option as a temporary measure to address cover conditions until the low permeability soil cover is added. Since the 12-mil Cover was not a long-term solution, CCL was required to install a more durable geosynthetic cover, 24-mil to 30-mil with welded seams, that will offer better performance and reduced maintenance. In short, the LEA recommended that CCL install the proposed 12-mil Cover now while it acquires low-permeability soil or opt to install a thicker and more durable geosynthetic cover between 24-mil to 30-mil with welded seams in lieu of the low permeability soil cover. A proposal for this option must be submitted to the LEA for review and approval.

2.54 On December 19, 2023 the LEA received a workplan from CCL (December 19, 2023 Plan) to install 30-mil high density polyethylene (HDPE) geosynthetic cover over the reaction settlement area.

2.55 On December 20, 2023, the LEA issued an approval (December 20, 2023 LEA Letter) on the condition that CCL submit the design specifications of the proposed geosynthetic cover pressure relief valves discussed in the December 19, 2023 Plan within 10 days.

2.56 On December 29, 2023, the LEA received a letter from CCL (December 29, 2023 CCL Letter) with the required information on the pressure relief valves.

2.57 On January 19, 2024, a meeting was held between CCL, LEA and CalRecycle to communicate that the pressure relief valves would not be approved by the LEA. Other methods to prevent potential LFG accumulation underneath the geosynthetic cover were discussed.

2.58 On January 23, 2024, the LEA received a letter from CCL (January 23, 2024

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CCL Letter) which stated that CCL no longer intended to install the pressure relief valves from the December 19, 2023 Plan. In addition, CCL provided an updated installation schedule for the 30-mil cover in the following order: 1) northerly portion of the western slope of the reaction area, 2) central portion of the western slope of the reaction area, 3) top deck of the reaction area and 4) north slope of the reaction area. Although CCL did not provide a specific date, the letter stated that installation of the cover was anticipated to take 8 weeks with an additional week for reporting. Lastly, CCL informed the LEA that it anticipated installing well boot seals on all wells located outside of the areas that will be covered with geosynthetic cover by February 16, 2024, and installing the remaining well boot seals as the geosynthetic cover is installed.

2.59 On January 26, 2024, the LEA issued a conditional approval (January 26, 2024 LEA Letter) in response to the January 23, 2024 CCL Letter. Per the conditions, in lieu of the pressure relief valves, CCL was to provide a system and procedure to ensure that LFG does not accumulate underneath the geosynthetic cover and to prioritize LFG extraction from the reaction area over other areas of the landfill, if necessary, by February 2, 2024. In addition, CCL was directed to submit weekly updates to the LEA on the geosynthetic cover installation (Weekly Geosynthetic Cover Updates) commencing the week of January 28, 2024 and complete the geosynthetic cover installation by March 25, 2024 (8 weeks from the start of cover installations as provided by the January 23, 2024 CCL Letter).

2.60 On February 2, 2024, the LEA received a response from CCL (February 2, 2024 CCL Letter) that adequately addressed all of the conditions listed in the January 26, 2024 LEA Letter as stated in the LEA response letter dated March 4, 2024 (March 4, 2024 LEA Letter).

2.61 To address ongoing delays documented in CCL's Weekly Geosynthetic Cover Updates received through February 23, 2024, the LEA issued the February 26, 2024 LEA Letter. CCL had reported delays caused by rain events and related safety issues without providing an update on the need for a revised installation schedule for the 30-mil geosynthetic cover. LEA

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instructed CCL to provide a written response by February 29, 2024 with an updated construction schedule that details an accurate timeline for the installation of the geosynthetic cover, weekly goals for the installation, and what efforts and resources (such as additional equipment and workforce) are being implemented to expedite the work and meet the proposed timeline.

2.62 The February 29, 2024 CCL Letter provided justification for delays and a new schedule for the installation of the geosynthetic cover. Due to weather conditions and related safety concerns, and an increase of the reaction area from 23.9 acres to 30 acres due to site conditions, the anticipated completion date was extended from March 25, 2024 to April 26, 2024, weather permitting. The submittal date for the completion report for the geosynthetic cover installation was consequently extended to May 3, 2024.

2.63 On March 4, 2024, LEA, CalRecycle and CCL staff met virtually and pointed out a typographical error with the compliance schedule and the lack of an official time extension request in the February 29, 2024 CCL Letter.

2.64 On March 4, 2024 CCL corrected the typographical error referred to in para. 2.63 and officially requested modification to the timeline for geosynthetic cover installation.

2.65 On March 20, 2024, the LEA issued an approval (March 20, 2024 LEA Letter) to the modified schedule and of the April 26, 2024 completion date for the installation of the 30-mil geosynthetic cover, and directed CCL to continue to provide weekly updates on the progress of the installation of the geosynthetic cover including any delays due to rain events or other special occurrence that may affect the modified schedule.

2.66 On April 19, 2024 the LEA received a memorandum from CCL (April 19, 2024 CCL Memorandum) that provided an updated geosynthetic coverage acreage, from 30 acres to 43.9 acres, and revised schedule for installation of the geosynthetic cover with, From April 26, 2024 to July 12, 2024. According to the memorandum, April 26, 2024 deadline could not be met due to

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delays related to concerns with wet weather, high winds, slope stability, and safety. The July 12, 2024 completion date did not include the replacement of the 12-mil Cover that is currently over the western slope with the 30-mil geosynthetic cover due to high leachate levels.

2.67 On May 10, 2024, the LEA issued a letter to CCL (May 10, 2024 LEA Letter) directing CCL to resubmit a revised schedule by May 14, 2024, that prioritizes the installation of the 30-mil geosynthetic cover in the reaction area (30 acres per the March 4, 2024 CCL Letter) over additional areas that CCL elected to also cover, and include a completion date for installation of the cover over the 30 acres, and a plan to manage the leachate at the western slope to allow for timely installation of the 30-mil geosynthetic cover.

2.68 On May 14, 2024, the LEA received two memorandums from CCL. One memorandum provided additional information on the need for the extended deadline of July 12, 2024, to complete the installation of the 30 acres of geosynthetic cover over the reaction area (May 14, 2024 CCL Updated Schedule). The other memorandum detailed the construction of a toe drain system to manage the leachate and allow for the installation of geosynthetic cover over the portion of the western slope currently covered by the 12-mil Cover. (May 14, 2024 CCL Plan).

2.69 On May 29, 2024, the LEA issued a letter to CCL (May 29, 2024 LEA Letter) stating that the May 14, 2024 CCL Updated Schedule is adequate, and required CCL to continue to provide weekly updates on the progress of the installation of the geosynthetic cover that include specific reasons for any further delays that may be due to rain events or other special occurrence that may affect the extended implementation of the new schedule. Also, the LEA determined the May 14, 2024 CCL Plan to be adequate contingent on the condition that CCL confirms waste temperatures are below the manufacturer's recommended maximum temperature limit of the proposed materials used.

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Mitigation Measure 2B - Cover Tracking

2.70 The December 6, 2023 CCL Response to the November 21, 2023 LEA Letter had no comment on Mitigation Measure 2B requirements and agreed to submit the required plan by the due date.

2.71 On December 6, 2023, the LEA received the Soil Cover Tracking Written Plan (December 6, 2023 Cover Tracking Plan) to monitor for fissures and cracks in the soil cover, collect and compile notes and pictures, and submit Weekly Cover Reports to the LEA. To track and document settlement, CCL proposed to use drones to document settlement on a biweekly basis.

2.72 On December 14, 2023, the LEA issued a letter (December 14, 2023 LEA Letter) requiring CCL to revise the December 6, 2023 Cover Tracking Plan to include response to issues that may arise with the geosynthetic cover, such as tears and where fill is needed to support the liner or maintain drainage, the necessary actions taken, and a photo log that has before and after pictures of the cover issues.

2.73 LEA received the Revised Plan dated December 21, 2023 (December 21, 2023 Revised Plan) that included documentation and tracking of issues related to the geosynthetic cover in addition to soil cover as well as a photo log of observations with before and after pictures.

2.74 On January 3, 2024, the LEA issued an approval (January 3, 2024 LEA Letter) to the December 21, 2023 Revised Plan and directed CCL submit Weekly Cover Reports starting January 9, 2024.

2.75 The LEA letter dated March 22, 2024 (March 22, 2024 LEA Letter), responded to the Slope Stability Analysis Report (Mitigation Measure 3) and addressed the Weekly Cover Reports. The LEA directed CCL to revise the Weekly Cover Reports to include a log with a summary and a map to track the documented fissures and tension cracks and to identify trends, to evaluate the documented series of fissures and tension cracks reported in recent Weekly Cover

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Reports from February and March 2024, and to include methods used to track the instability in the reaction area that is obscured by the geosynthetic cover.

2.76 On April 10, 2024, a virtual meeting was held between CCL, LEA and CalRecycle (April 10, 2024 Meeting) to discuss the status of Mitigation Measures 1-3 and the need for a second revision of the December 6, 2023 Cover Tracking Plan to address Mitigation Measure 2B. The LEA directed CCL to include in future weekly reports a section to document any instability events such as observations that led to CCL directing crews to cease work on the western slope mid-day March 20, 2024, because of concerns related to slope stability and pending the slope stability analysis report as per the March 22, 2022 Weekly Cover Report.

2.77 CCL submitted the second Revised Cover Tracking Plan dated April 16, 2024 (April 16, 2024 Revised Plan) that proposed to submit a map to identify and evaluate trends in the reported fissures and tension cracks. CCL proposed to perform daily visual inspections and bi-weekly drone flyovers, and other actions to track the instability of the reaction area obscured by the geosynthetic cover. In addition, CCL would include a profile of the western slope consisting of cross sections taken during the beginning and end of the month in the report.

2.78 On May 2, 2024, the LEA approved the second Revised Cover Tracking Plan (May 2, 2024 LEA Letter) and directed CCL to submit monthly reports starting May 14, 2024. The LEA also reminded CCL to include a section on stability issues as discussed during the April 10, 2024 Meeting.

2.79 The LEA issued a letter to CCL on May 29, 2024 (May 29, 2024 LEA Letter) to address, among other items, the Weekly Cover Reports dated May 10 and May 14, 2024, in which CCL made inaccurate statements that misrepresented the reason why the liner crews were removed from the western slope. The specific CCL statements were that "Landfill personnel were directed to cease normal activities on the western slope on or around March 20, 2024, because of the LEA's concerns regarding the potential slope stability and related safety

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concerns.” The LEA noted that CCL elected to remove crews without notifying the LEA for at least 48 hours, when the LEA received the March 22, 2024 Weekly Cover Report. CCL was directed to amend each the May 10 and 14, 2024 reports to reflect that CCL elected to move the liner crews because the crews noticed an additional bulge of waste at the toe of the slope. In addition, CCL was required to include slope stability concerns to the Weekly Cover Reports beginning June 4, 2024.

Mitigation Measure 3 – Slope Analysis

2.80 The December 6, 2023 CCL Response to the November 21, 2023 LEA Letter had no comment on the Mitigation Measure 3 requirement and agreed to submit a work plan with timeline by the due date.

2.81 CCL submitted the Slope Stability Analysis Workplan to the LEA on December 14, 2023 (December 2023 Slope Stability Analysis Plan).

2.82 On December 20, 2023, the LEA issued a letter accepting the December 2023 Slope Stability Analysis Plan with conditions. According to a timeline submitted by CCL, a Slope Stability Analysis Report would be submitted to the LEA by February 22, 2024.

2.83 The Slope Stability Analysis Report was received by the LEA on February 22, 2024 (February 2024 Slope Stability Analysis Report).

2.84 The March 22, 2024 LEA Letter in response to the February 2024 Slope Stability Analysis Report required CCL to perform additional analyses based on the current actual observed conditions of the waste and gas extraction wells. For example, the analysis in the February 2024 Slope Stability Analysis Report used peak shear strength instead of reduced shear strength. CCL was also directed to include a plan to monitor and record the temperature of the liner at the bottom of the landfill to verify and document that there are no anticipated impacts to its the long-term performance given the potential exposure to high subsurface temperatures associated with the ongoing reaction. The plan regarding the liner was referred to the LARWQCB.

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2.85 On May 8, 2024, the LEA received a draft of the revised Slope Stability Analysis Report dated May 2024 (May 2024 Slope Stability Analysis Report). The report is currently under review.

Mitigation Measure 4 – Manufacturer Specifications

2.86 The December 6, 2023 CCL Response to the November 21, 2023 LEA Letter had no comment regarding Mitigation Measure 4 and agreed to comply with this mitigation measure.

2.87 The May 29, 2024 LEA Letter in response to the May 14, 2024 Plan to install a toe drain at the western slope directed CCL to confirm the waste temperatures are below the manufacturer's recommended maximum temperature limit of the proposed pipe materials. The letter guided CCL to use a forward-looking infrared camera to ensure the HDPE or other material can perform as designed within the recommended temperature limits.

3.0 STATEMENT OF FACTS PERTAINING TO VIOLATION 27 CCR § 20921:

3.1 Pursuant to 27 CCR Section 20921, in order to provide for the protection of public health and safety and the environment, the operator shall ensure that the concentration of methane gas migrating from the disposal site must not exceed 5% by volume in air at the disposal site permitted facility boundary or an alternative boundary approved in accordance with 27 CCR § 20925.

3.2 Beginning with the focused inspection dated September 1, 2023, periodic inspection reports dated September 19, October 25, November 28, December 19, 2023, January 17, February 7, March 26, and April 30, 2024, continue to note the violation for exceedance of methane as described below.

3.3 On September 1, 2023, the LEA measured the methane level at perimeter monitoring well GP-13 at above 5% by volume in air (bv), resulting in a violation of 27 CCR Section § 20921. CCL was directed via email on September 9, 2023, to comply with 27 CCR § 20937 which requires submittal of a remediation plan for approval and implementation within 60 days of noted exceedance and as documented on the report dated September 1, 2023. CCL submitted a



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remediation plan to address the methane exceedance at GP-13 on September 8, 2023 (September 8, 2023 Remediation Plan).

3.4 On September 15, 2023, CCL submitted a second remediation plan to include methane exceedance measured by the CCL at GP-15 (September 15, 2023 Remediation Plan). On September 19, 2023, the LEA measured methane levels at perimeter monitoring wells GP-13 and GP-15 at above 5% bv resulting in a violation of 27 CCR § 20921.

3.5 LEA electronic communication with CCL called for CCL to submit subsequent revised plans dated October 6, 2023 (October 6, 2023 Remediation Plan) and November 22, 2023 (November 22, 2023 Remediation Plan) addressing the exceedance at both probes GP-13 and GP-15. The LEA issued a rejection letter on February 6, 2024 (February 6, 2024 LEA Letter) directing CCL to respond to specific comments in a revised plan by February 23, 2024.

3.6 On February 27, 2024, the LEA received the latest version of the remediation plan (February 2024 Remediation Plan) that proposed to install an additional 107 LFG extraction wells by July 31, 2024.

3.7 The LEA approved the February 2024 Remediation Plan by letter May 8, 2024 (May 8, 2024 LEA Letter) requiring the LFG well installation to be completed by July 31, 2024, as proposed by CCL. Upon installation of the LFG extraction wells, CCL is required to continue to monitor the methane levels in all perimeter monitoring wells on a weekly basis and provide the results to the LEA for a monitoring period of 120 days. If the LEA's monitoring shows that the concentration of methane is and remains below the regulatory limit for three (3) consecutive monitoring events and the weekly results submitted by CCL provide supporting evidence that the landfill gas is controlled not to exceed 5% bv in air at the Site's perimeter boundary, then the Site will be deemed compliant with 27 CCR § 20921. If compliance with 27 CCR § 20921 is not achieved within the 120-day monitoring period, then a new remediation plan must be submitted to the LEA for review and approval within 30 calendar days.

3.8 The February 2024 Remediation Plan was also approved by CalRecycle on April 15, 2024 (April 15, 2024 CalRecycle Letter) as required by 27 CCR § 20937.

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4.0 PLACEMENT OF CCL ON THE INVENTORY:

4.1 The LEA issued inspection reports of CCL dated September 1, September 19, October 25, November 28, December 19, 2023, and January 17, 2024. Violations of 27 CCR, Sections 20921 (Gas Monitoring and Control) and 20750 (Site Maintenance) have been noted monthly on LEA inspection reports to date beginning September 1, 2023, and November 28, 2023, respectively.

4.2 On February 8, 2024, CalRecycle notified CCL in a letter sent via certified mail, and received by CCL on February 10, 2024, that if the violations were not corrected within 90 days of receipt of the letter that pursuant to PRC § 44104, the site would be placed on the Inventory of Solid Waste Facilities Which Violate State Minimum Standards (Inventory).

4.3 After confirming with the LEA that violations of the noted standards remained uncorrected and were continuing, on May 16, 2024, pursuant to 14 CCR § 18364, an Inclusion letter was sent by CalRecycle, notifying CCL that CCL was placed on the "Inventory of Facilities Violating State Minimum Standards" list (Inventory List). Inclusion on the Inventory List requires the LEA to establish and issue a compliance schedule to the facility within 15 business days from the date of the inclusion letter. (14 CCR § 18365(a).)

4.4 The purpose of the compliance schedule is to ensure that diligent progress is made by the operator to bring the facility into compliance pursuant to PRC § 44106. (14 CCR § 18304.3.)

4.5 The compliance schedule may be incorporated into a Notice and Order. (14 CCR §§ 18304.3 and 18361(a).)

4.6 The Compliance Schedule must require that all tasks and deadlines be completed within the timeframes specified in 14 CCR § 18365(b).

5.0 VIOLATIONS:

5.1 CCL is in violation of 27 CCR § 20750 (Site Maintenance) and 27 CCR § 20921 (Gas Monitoring and Control).

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6.0 ORDER FOR COMPLIANCE SCHEDULE:

6.1 On June 4, 2024, the LEA met with CCL to discuss the issuance of the Compliance Order. The Compliance Schedule was reviewed with CCL and an extension was asked for the Compliance Deadline for Milestone 1A-2, 1B-1 and 2A-1. The LEA granted the extensions and has updated the deadlines to the dates requested by CCL.

6.2 Pursuant to PRC §§ 43209, 44106, 45000, 45005, 45011, 45017, and 45023, 27 CCR §§ 20750 and 20921, and 14 CCR §§ 18304, 18304.1, 18304.3(b), and 18365(a), Respondent CCL is hereby ordered to comply with the following compliance schedule to eliminate the existing violations:

Compliance Schedule		
27 CCR Section 20750 – Site Maintenance <i>The operator shall promptly repair or correct defective conditions with respect to state minimum standards. All other aspects of the site shall be kept in a state of reasonable repair. THE FINAL DATE TO ACHIEVE FULL COMPLIANCE WITH 27 CCR § 20750 IN ACCORDANCE WITH THE COMPLIANCE SCHEDULE IS AUGUST 2, 2024.</i>		
Milestone	Action Plan/Directive	Compliance Deadline
1A - 1	Submit a revised Air/Soil Break Plan to the LEA for review and approval. The revised Air/Soil Break Plan must fully address the LEA directives including data from TMPs and LFG collection wells (refer to the May 3, 2024, LEA Letter for details) to inform the required items mentioned below: a. Investigate how each cell or phase was constructed and examine if air/soil breaks between cells/phases can be exploited. The investigation should include a review of where haul roads were constructed to determine if the inert roads can also be used as fuel breaks. Information from the investigation should be used to develop where containment breaks should be placed. b. Propose a set of criteria for the primary and secondary engagement lines and the type of reaction breaks/barriers and/or mitigations. These criteria shall	July 8, 2024

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	<p>be based on temperature, CO, and possibly settlement rate. The primary engagement lines need to prevent the reaction from spreading in the main fill close to the reaction.</p> <p>The secondary engagement lines need to prevent the reaction from entering the eastern and southern fill areas at the toe of the slope.</p> <p>c. Investigate and propose construction of air/soil reaction breaks in the main 160-acre fill area for the reaction of the engagement lines with either an inert material or air.</p> <p>d. Include the construction of air/soil reaction breaks/barrier between Canyon C, A, D, and Cell 5 in the event the reaction reaches the secondary engagement lines.</p> <p>e. Include timelines and method of construction. The timelines and engagement lines must match.</p> <p>f. Use best available technology, such as grout injection, to slow or contain reaction movement to the south and east.</p> <p>g. Description of the criteria that will mandate the temporary suspension of placing new waste.</p> <p><i>CCL may submit an alternative plan to the LEA for review, only if such plan is adequately supported by substantive data and studies and provides assurances to the LEA that the reaction is no longer a threat to public health, safety and the environment.</i></p> <p>Note: If the air/soil break plan submitted by CCL is rejected by the LEA after the final compliance date for this violation, then a penalty will be assessed from the date LEA issues a rejection until the air/soil break plan is approved by the LEA. (No penalty will be assessed during the period of LEA review.)</p>	
1A - 2	<p>Submit a report with CO and H2 readings for all gas collection wells in the reaction area and wells 200 feet outside the reaction area, including the following:</p>	June 11, 2024

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	<p>a. The gas data tabulated with the following information: date collected or measured, wellhead temperature, analyte names and concentrations, including but not limited to permanent gases and H₂ analyzed using thermal conductivity detection/ gas chromatography (TCD/GC) ASTM D1946-14 and CO analyzed using flame ionization detection/total combustion analysis (FID/TCA), EPA Method ALT-144</p> <p>b. Sampling summary, map showing the reaction area as it is currently defined, gas sampling plan, Quality Assurance/Quality Control data, and proposed holding times, and whether holding times were exceeded, etc.</p> <p>c. Report as a standalone document that is signed by a licensed engineer or qualified responsible person.</p>	
1A - 3	Submit the laboratory test results for <u>all</u> monthly LFG sampling (including CO and H₂) from a set of LFG wells selected by the LEA after the baseline sampling for CO and H₂ is completed and provided to the LEA as described above. The LFG data that is collected must be submitted to the LEA in a standalone report signed by a licensed engineer or qualified responsible person and include a discussion of the sampling, LFG data, and a graphic showing CO and H₂ trends over time.	Monthly by the 15th of the following month, from the date that CCL receives the selected LFG wells from the LEA
1B - 1	<p>Submit a revised Completion Report for the installation of the TMPs that include the following:</p> <p>a. Site map that includes the location of the TMP's location, the completion depth at each well, and as-builts. The map must also include the reaction area as it is defined as of May 1, 2024.</p> <p>b. Provide real-time access to temperature data to the LEA and CalRecycle and specify the method of access (e.g., web portal).</p> <p>c. Temperature data that includes the maximum temperature recorded at each TMP.</p>	June 11, 2024

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	d. Signature and stamp of a licensed engineer or qualified responsible party to show all work can be clearly attributed to the licensee(s) in responsible charge of the work.	
1B - 2	<p>Continue to submit the Weekly TMP Reports. Revise the reports so they are standalone documents that include the following:</p> <p>a. Graphs that show the maximum temperature recorded at each TMP. CCL may choose to continue to also include the average temperature in the weekly reports.</p> <p>b. Map delineating the reaction area with the maximum observed temperature at each TMP with depth.</p> <p>c. Narrative describing any anomalies, outliers, data gaps, issues or malfunctions. The narrative must describe any temperature increases of 20°F or greater within 48 hours or 10°F in a week.</p>	June 7, 2024, and weekly each Friday thereafter
1B - 3	<p>Provide a temperature contour map that shows each TMP with color-coded observations based on the maximum observed temperature collected during the month. Example was provided in the May 29, 2024 LEA Response.</p>	Monthly by the 15th of the month beginning June 2024.
1B - 4	<p>Install three temperature probes around the area that is extending south into areas outside of the previously defined reaction area as shown in the Weekly Cover Report dated May 14, 2024. Map showing locations of wells around the extended reaction area was provided in the May 29, 2024 LEA Response.</p> <p>Provide a final completion report that includes a map and as-builts that is signed by a registered engineer or qualified responsible person.</p>	July 11, 2024
2A - 1	<p>Install the approved 30-mil HDPE geosynthetic cover over the 30-acre reaction settlement area as defined in the Weekly Cover Reports dated up through May 28, 2024, and around any wells showing signs of reaction, i.e., any wells with temperature over 160°F or CO concentrations over 1,500 ppmv.</p>	August 2, 2024

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2A - 2	<p>Continue to provide Weekly Updates on the Installation of the 30-mil Geosynthetic Cover including a map showing approximate limits of the installed geosynthetic cover. Updates shall include any delays due to rain events or other special occurrences.</p> <p>Revise the map to show the required 30-mil geosynthetic coverage area, delineate any areas showing settlement and any wells showing signs of reaction.</p>	<p>Ongoing on Fridays with revised map beginning June 14, 2024.</p> <p><i>(Note: Weekly reporting may be reduced in frequency or discontinued only after the required geosynthetic cover is installed and with LEA written approval.)</i></p>
2B	<p>Continue to submit the Weekly Geosynthetic Cover Reports as in the approved April 16, 2024 Revised Written Plan, include the required directives in the May 29, 2024 LEA Letter.</p>	<p>Ongoing</p> <p><i>(Note: Weekly reporting may be reduced in frequency or discontinued only with LEA written approval.)</i></p>
3 - 1	<p>Ensure slope stability issues are included in the Weekly Geosynthetic Cover Reports as directed in the May 3, LEA Letter and May 29, 2024 LEA Response.</p>	<p>Ongoing</p> <p><i>(Note: Weekly reporting may be reduced in frequency or discontinued only with LEA written approval.)</i></p>
3 - 2	<p>Submit a West and North Slope Stability Analysis Final Report that fully addresses LEA's comments.</p>	<p>Two weeks from the date of the LEA comment letter</p>
<p>27 CCR Section 20921 – Gas Monitoring and Control <i>The concentration of methane gas migrating from the disposal site must not exceed 5% by volume in air at the disposal site permitted facility boundary or an alternative boundary approved in accordance with § 20925.</i> THE FINAL DATE TO ACHIEVE FULL COMPLIANCE WITH 27 CCR § 20921 IN ACCORDANCE WITH THE COMPLIANCE SCHEDULE IS NOVEMBER 28, 2024.</p>		

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4 - 1	<p>Install and operate an additional 107 LFG extraction wells as per approved February 26, 2024 Remediation Plan for LFG Exceedance. Notify the LEA upon completion.</p> <p>Provide a final completion report that includes a map and as-builts that is signed by a registered engineer or qualified responsible person.</p>	<p>July 31, 2024</p>
4 - 2	<p>Continue to submit a weekly status update on the installation of the LFG extraction wells as per the May 8, 2024 LEA Letter.</p>	<p>Ongoing</p> <p><i>(Ongoing until completion of installation of all LFG extraction wells listed in the February 26, 2024 Remediation Plan.)</i></p>
4 - 3	<p>Continue to submit weekly results of methane readings at perimeter monitoring wells GP-13 and GP-15.</p>	<p>Ongoing until compliance with 27 CCR 20921 has been demonstrated as set forth in Milestone 4-4</p> <p><i>(Note: Weekly reporting may be reduced in frequency or discontinued only with LEA written approval.)</i></p>
4 - 4	<p>Demonstrate compliance with 27 CCR Section 20921 within the 120-day compliance period that begins after the completion of the planned LFG extraction well construction referred to in the February 2024 Remediation Plan.</p> <p>In order to demonstrate compliance, the concentration of methane must be at or below regulatory limit for three (3) consecutive monitoring events conducted by the LEA, and the weekly results submitted by CCL must provide supporting evidence that the LFG is controlled not to exceed 5% by volume in air at the site's perimeter boundary.</p>	<p>120 days after completion of the LFG extraction well installation and no later than November 28, 2024 (Compliance Period)</p> <p><i>(Note: November 28, 2024 is based on the</i></p>

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		<i>anticipated completion date for installation of the LFG extraction wells.)</i>
5	Submit a consolidated monthly report with individual maps overlayed with the following data in an easily understood format <ul style="list-style-type: none"> - Defined reaction area; - Expansion of reaction area if any; - Weekly TMP data; - Settlement with heat maps; and - LFG data including, but not limited to CO and H2 data 	Monthly by the 15th of the month, from the date that CCL receives the selected LFG wells from the LEA - Refer to Milestone 1A-3 <i>(Note: Monthly reporting may be reduced in frequency or discontinued only with LEA written approval.)</i>

7.0 APPLICABLE TO ALL MILESTONES:

7.1 CCL must obtain all required and necessary Federal, State, and local permits prior to commencement of any work at the site.

7.2 Notwithstanding anything to the contrary herein, if any of the above milestones and compliance deadlines cannot be met in good faith, CCL may submit a written extension request to the LEA setting forth good cause justification.

7.3 Pursuant to PRC § 45011, failure to comply with the final compliance date for each violation, unless otherwise excused in writing by the LEA, will result in the LEA issuing an administrative penalty order for penalties payable by CCL to the LEA, of up to \$5,000 per day for each day that CCL is in violation of the final compliance schedule for a particular violation, calculated from the day after the violation compliance date, until the date compliance is achieved and verified by the LEA.

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**8.0 NOTICE OF FURTHER PENALTIES AND ENFORCEMENT THAT MAY RESULT FROM
FAILURE TO COMPLY WITH THE LEA'S ORDER:**

8.1 The LEA may assess administrative civil penalties not to exceed five thousand dollars (\$5,000) for each violation, for each day that the violation continues, if compliance is not achieved in accordance with the compliance schedule set forth in this Order. (PRC §§ 45010.1 and 45011.)

8.2 The LEA may suspend or revoke the solid waste facility permit if the facility does not meet the requirements contained in the compliance schedule issued by the LEA until the violation(s) of state minimum standards which caused the facility to be included in the Inventory are remedied. (PRC §§ 44305 and 44306, and 14 CCR §§ 18307 and 18368(b).)

8.3 The LEA may file a petition in the Superior Court for injunctive relief to enforce any part of this Order. (PRC §45014.)

8.4 Upon failure to comply with the Order, the LEA may bring an action in the Superior Court to impose upon CCL civil penalties of not more than ten thousand dollars (\$10,000) for each day a CCL is in violation of the Order. (PRC §§ 45023 and 45024.)

8.5 The LEA and/or CalRecycle shall not be liable for injuries or damages to persons or property resulting from acts or omissions by CCL or related parties in carrying out activities pursuant to this order, nor shall the LEA and/or CalRecycle be held as a party to any contract entered into by CCL or its agent(s) in carrying out activities pursuant to this Order.

8.6 Nothing in this Order shall constitute or be construed as a satisfaction or release from liability for any conditions or claims arising as a result of past, current, or future operations. Notwithstanding compliance with the terms of this Order, CCL may be required to take further actions as necessary to protect public health and safety or the environment.

8.7 This Order does not relieve CCL from complying with all other local, state, and federal requirements or prevent the LEA and/or CalRecycle from taking any and all other actions allowed by law.

8.8 This Order is supported by the accompanying declarations by Eric Morofuji and Mark Como.



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8.9 This Order may only be amended in writing by an appropriate representative of the LEA.

9.0 RIGHT TO APPEAL

9.1 CCL has the right to appeal this Order (PRC §§ 44307 and 44310) by submitting a written request for a hearing, together with a statement of issues on which appeal is based, within 15 days. Request for Hearing is provided with this Order. The appeal must be sent via U.S. Mail to Los Angeles County Public Health, Solid Waste Management Program/Local Enforcement Agency (LEA), 5050 Commerce Drive, Baldwin Park, Ca 91706, Attention: Karen Gork or via electronic mail to kgork@ph.lacounty.gov.

9.2 An appeal does not stay the effect of any provision of this Order. However, you may petition the Director of CalRecycle, in writing, to stay the effect of this Order, or portion thereof, pending the completion of administrative appeals. (PRC § 45017.) A petition submitted must be in writing and shall state the extraordinary circumstances that justify the stay. The petition shall also state the grounds, if any, on which a finding may be made that the immediate effect of the order or determination will preclude or interfere with the provision of an essential public service so that the public health and safety or the environment will be adversely affected.

10.0 CERTIFICATION

10.1 This Compliance Order is issued as of the date set forth below.

Signed: Liza Frias Date: June 6, 2024

Liza Frias, Director, Environmental Health
Los Angeles County LEA

Attachments:

Declarations
September 1, 2023 LEA Focused Inspection Report



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September 19, 2023 LEA Periodic Inspection Report

October 25, 2023 LEA Periodic Inspection Report

November 28, 2023 LEA Periodic Inspection Report

December 19, 2023 LEA Periodic Inspection Report

January 17, 2024 LEA Periodic Inspection Report

February 7, 2024 LEA Periodic Inspection Report

March 26, 2024 LEA Periodic Inspection Report

April 30, 2024 LEA Periodic Inspection Report

May 14, 2024 LEA Focused Inspection

October 16, 2023 CalRecycle Letter

October 17, 2023 LEA Letter

October 20, 2023 CCL Response

November 14, 2023 CalRecycle Letter

November 21, 2023 LEA Letter

December 6, 2023 CCL Response

April 5, 2024 LEA Letter

April 12, 2024 CCL Response

March 27, 2024 Plan

May 3, 2024 LEA Letter

May 8, 2024 Data

May 28, 2024 LEA Letter

December 20, 2023 Plan

December 22, 2023 LEA Letter

January 2, 2024 CCL Letter

January 17, 2024 CCL Letter



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January 29, 2024 LEA Letter

February 26, 2024 LEA Letter

February 29, 2024 CCL Letter

March 4, 2024 CCL Letter

March 20, 2024 LEA Approval

March 20, 2024 LEA Letter

March 28, 2024 Report.

April 16, 2024 CCL Letter

April 24, 2024 LEA Letter

May 3, 2024 CQA Report

May 29, 2024 LEA Response

December 8, 2023 CCL Memorandum

December 14, 2023 LEA Letter

December 19, 2023 CCL Plan

December 20, 2023 LEA Letter

December 29, 2023 CCL Letter

January 23, 2024 CCL Letter

January 26, 2024 LEA Letter

February 2, 2024 (CCL Letter)

April 19, 2024 CCL Memorandum

May 10, 2024 LEA Letter

May 14, 2024 CCL Updated Schedule

May 14, 2024 CCL Plan

May 29, 2024 LEA Letter

December 6, 2023 Cover Tracking Plan



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December 21, 2023 Revised Plan

January 3, 2024 LEA Letter

March 22, 2024 LEA Letter

April 16, 2024 Revised Plan

May 2, 2024 LEA Letter

CCL Barrier Discussion presentation

Isolation Break Criteria Example document

December 2023 Slope Stability Analysis Plan

February 2024 Slope Stability Analysis Report

February 26, 2024 60-Day Remediation Plan for GP-13 and GP-15

April 15, 2024 CalRecycle Response to 60-Day Remediation Plan

May 8, 2024 LEA Letter Response to 60-Day Remediation Plan

Request for Hearing Form

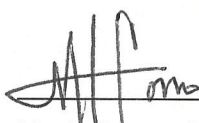
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Declaration

I, Mark Como, declare under penalty of perjury under the laws of the State of California that the following information is true and correct:

1. I am duly employed as an Environmental Health Specialist III in the Solid Waste Management Program for the Environmental Health Division of the Los Angeles County Department of Public Health. In this capacity, I act as an agent of the Local Enforcement Agency (LEA).
2. I am registered with the State of California as a Registered Environmental Health Specialist (REHS).
3. The information and allegations contained above are known to me to be correct based on my personal knowledge and inspections conducted at Chiquita Canyon Landfill located in the City of Castaic California.

Executed at: 5050 Commerce Drive, Baldwin Park, California 91706 on June 06, 2024.



Mark Como, EHS III
LEA



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Declaration

I, Eric Morofuji, declare under penalty of perjury under the laws of the State of California that the following information is true and correct:

1. I am duly employed as an Environmental Health Specialist III in the Solid Waste Management Program for the Environmental Health Division of the Los Angeles County Department of Public Health. In this capacity, I act as an agent of the Local Enforcement Agency (LEA).
2. I am registered with the State of California as a Registered Environmental Health Specialist (REHS).
3. The information and allegations contained above are known to me to be correct based on my personal knowledge and inspections conducted at Chiquita Canyon Landfill located in the City of Castaic California.

Executed at: 5050 Commerce Drive, Baldwin Park, California 91706 on June 6, 2024.

A handwritten signature in blue ink, appearing to read "Eric Morofuji", written over a horizontal line.

Eric Morofuji, EHS III

LEA

CHIQUITA CANYON, LLC [FACILITY ID No. 119219] – EXHIBIT B TO SUPPLEMENTAL DECLARATION OF NEAL BOLTON, P.E.

**DRAFT REMOVAL ACTION WORKPLAN:
Extension of Covered Area
Chiquita Canyon Landfill**

**Prepared For:
Chiquita Canyon, LLC**

**Prepared By:
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
SOLANA BEACH, CALIFORNIA**

CEC Project 350-750

MAY 2025



Civil & Environmental Consultants, Inc.

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FIGURES

Figure 1 Site Location Map

Figure 2 Facility Plan

Figure 3 Proposed and Potential Geomembrane Deployment Areas

APPENDICES

- Appendix A Extent of ETLF Reaction Area as of April 2025
- Appendix B Extent of Existing Geomembrane Cover
- Appendix C Viaflex Absolute Barrier X60BCS Product Brochure
- Appendix D *Updated Design and Installation Schedule of the Gas Collection and Control System Well Field Expansion Plan*
- Appendix E Surface Collector Typical Details
- Appendix F Viaflex Absolute Barrier X60BCS Material Specification
- Appendix G Geosynthetic Specifications and Construction Quality Assurance Requirements
- Appendix H *Geomembrane Cover Operations and Maintenance Plan, dated May 9, 2025*
- Appendix I *ETLF Operations Health and Safety Plan Version 2.2*
- Appendix J *Chiquita Canyon Landfill Odor Mitigation Plan (Revision 1.01).*

1.0 INTRODUCTION

This Removal Action Workplan (RAW) has been prepared on behalf of Chiquita Canyon, LLC (Chiquita) by Civil and Environmental Consultants, Inc. (CEC) in response to the Imminent and Substantial Endangerment Determination and Order (ISE Order) issued by the California Department of Toxic Substances Control (DTSC) on April 2, 2025, regarding the Elevated Temperature Landfill (ETLF) conditions occurring at the Chiquita Canyon Landfill (the Landfill or Site).

This RAW specifically addresses Section 5.1.2(a) of the ISE Order, *Extension of Covered Area*.

Approximately 45.9 acres of the northwest portion of the Landfill has been covered with a geomembrane intended to improve landfill gas (LFG) collection, impede the inflow of oxygen and water into the waste mass, and improve control of odors and emissions. The geomembrane was installed in accordance with the requirements of:

- The United States Environmental Protection Agency (USEPA) Unilateral Administrative Order (UAO) issued on February 21, 2024;
- The South Coast Air Quality Management District (SCAQMD) Stipulated Order for Abatement (SOFA), dated November 13, 2024, and most recently modified on April 16, 2025; and
- The Los Angeles County Department of Public Health, Solid Waste Management Program, acting as the Local Enforcement Agency (LEA) Compliance Order issued on June 6, 2024.

As required by the ISE Order, Chiquita will install additional geomembrane contiguous with the existing geomembrane. The initial, additional geomembrane deployment will be approximately 15 acres.

To comply with the ISE Order, the geomembrane will be made from high-density polyethylene (HDPE) with an inner core of ethylene vinyl alcohol (EVOH) barrier resin. The geomembrane will be at least 60-mils thick and textured on both sides. It can be manufactured with a tan color, although color selection will be based on availability and delivery times and could be tan, black, or white. New geomembrane deployment areas will be adjacent to, and seamed continuously with, the existing 30-mil geomembrane cover. Surface collectors will be installed beneath the geomembrane to prevent accumulation of LFG at local high points. Toe drains will be installed at the toe of slopes to collect liquids, where applicable.

The initial geomembrane deployment will occur in approximately three 5-acre segments. This phased deployment will facilitate installation of additional LFG control infrastructure and minimize disruption to the Landfill's operations and implementation of mitigation measures. Procurement of the geomembrane requires a relatively long lead time. Consequently, preparatory work will start around the end of July, contingent on DTSC's approval of the RAW. The installation of the 15 acres of the geomembrane cover is expected to be completed by mid-October, before the typical Los Angeles area rain season starts.

The RAW has been prepared to meet the requirements presented in Sections 5.1.2(a) and 5.3 of the ISE Order and in accordance with California Health and Safety Code §78130 and §§79195-

79240. Where applicable, sections in the RAW identify the specific requirement listed in the ISE Order. Requested plans or reports have been attached as appendices, except where the document is publicly available online.

DRAFT

2.0 SITE DESCRIPTION, BACKGROUND, RAW OBJECTIVES

This section provides a site description and a summary of the site history and Chiquita's existing geomembrane cover that was installed to improve odor control. It also addresses Section 5.3(a) of the ISE Order.

2.1 SITE DESCRIPTION

The Site is in northwestern Los Angeles County (Figure 1), directly east of the Ventura County line and approximately 3 miles west of the junction of Interstate 5 and State Route 126 (SR-126), which is also known as the Castaic Junction. The Site has the following physical address:

29201 Henry Mayo Drive
Castaic, California 91384

It occupies the following parcels:

- 3271-002-011;
- 3271-002-013;
- 3271-002-019;
- 3271-002-036;
- 3271-002-039; and
- 3271-005-034.

These parcels are zoned A-2-2 heavy agriculture, which allows for the construction and operation of solid waste landfills. The surrounding area consists of land zoned industrial, agricultural, and residential.

The Site lies within the United States Geological Survey (USGS) Val Verde, 7½-Minute Quadrangle. The geographic coordinates of the Site are latitude North 34° 25' 28" and longitude West 118° 38' 47".

The Site is permitted as a Class III Non-Hazardous Solid Waste landfill. As shown in Figure 2, the property is approximately 639 acres, with approximately 400 acres designated for waste disposal.

As shown in Figure 2, the constructed landfill consists of three modules (2B/3/4, 4, and 5), six cells (2 PH 2A, 2 PH 2B, 1/2A, 6, 8A and 8B), and six canyon fills (Primary Canyon, Canyon A, Canyon B, Canyon C Cell 1, Canyon C Cell 2 PH1, and Canyon D). The Primary Canyon (approximately 55 acres) operated from 1970 to 1987, and Canyon B (approximately 15 acres) operated from 1987 to 1988. The "Main Canyon" is comprised of Canyons A, C, and D, and Cells 1 through 6 and 8. The Primary Canyon and Canyon B are separate from the Main Canyon and cannot be impacted by the ETLF event (see next section).

2.2 SITE HISTORY AND CURRENT STATUS

The Site was first approved for waste disposal in 1967 and operated as a permitted Class III Non-Hazardous Solid Waste landfill beginning in 1972. It accepted a range of non-hazardous solid

waste that includes municipal solid waste, green waste for composting or recycling, construction and demolition debris, and e-waste for recycling. Consistent with its permits and other typical Class III landfills, the Site is prohibited from accepting hazardous waste, biohazardous waste, household hazardous waste, radioactive materials, incinerator ash, sludge, automobile shredder waste (after 2017), and liquid waste. Chiquita began operating the Site in April 2009. On January 1, 2025, the Site ceased further acceptance of waste material.

The Landfill is currently exhibiting signs of an ETLF event, also referred to as a landfill reaction. An approximate outline of the area of the Landfill affected by the reaction, often referred to as the “data-driven reaction area” or the “reaction area”, as of April 2025, is shown in Appendix A. Because of this condition, the Site was directed to install a geomembrane cover under three compliance orders to limit migration of landfill gas (LFG) from the site. USEPA issued a UAO on February 21, 2024 that required, in part, installation of a geomembrane cover under a *Master Work Plan* (Item 22 (b) (3)). The South Coast Air Quality Management District (SCAQMD) *Stipulated Order for Abatement* (SOFA), dated November 13, 2024, and most recently modified on April 16, 2025, included Condition 31 specifically requiring a geomembrane cover and Condition 50 (requiring implementation of the Master Work Plan developed under the UAO). The requirement to install the geomembrane cover was also addressed in Milestone 2A-1 of the LEA’s June 6, 2024 Compliance Order.

As required by the orders, a 30-mil geomembrane was installed in phases over the slopes and top deck in the northwest portion of the site as described in the *Third Revised Cover Installation Plan*, prepared by Chiquita, and submitted to USEPA on January 9, 2025, as Attachment D to the *Master Work Plan*.¹ The approximate limits of the geomembrane cover installed as of January 3, 2025 is illustrated in a figure provided by Chiquita’s consultant, Tetra Tech, titled, *Approximate Limits of Geosynthetic Cover* (Appendix B). The geomembrane covers approximately 45.9 acres of the northwest portion of the landfill. The completed work is also fully described in Chiquita’s *Final Completion Report* submitted to the LEA on January 17, 2025.²

On April 1, 2025, DTSC issued the ISE Order which requires Chiquita to further extend the geomembrane coverage area.

2.3 REMOVAL ACTION WORKPLAN GOALS AND OBJECTIVES

This section addresses Section 5.3(a) of the ISE Order. The primary goal/objective of this removal action is to extend the area of the Landfill provided with a geomembrane cover.

¹ See <https://chiquitacanyon.com/odor-mitigation/stipulated-order-for-abatement/>.

² See Final Completion Report of Milestone 2A-1 (Formerly Mitigation Measure #2A), Chiquita Canyon Landfill, Jan. 17, 2025, available at <https://chiquitacanyon.com/odor-mitigation/>.

3.0 DESIGN AND IMPLEMENTATION PLAN

The following sections describe the proposed extension of the geomembrane, construction quality assurance, permitting requirements, and operations and maintenance considerations.

3.1 GEOMEMBRANE DEPLOYMENT IMPLEMENTATION PLAN

This section of the RAW addresses Section 5.3(c) of the ISE Order.

As noted in Section 2.2, approximately 45.9 acres of HDPE geomembrane have been deployed over the surface of the landfill. The majority of the installed geomembrane is 30-mil thick. A small portion of the geomembrane (1.3 acres) is 40-mil thick.

The ISE Order contemplates deploying geomembrane over most of the Main Canyon portion of the Landfill as shown in Figure 3. The area shaded in blue on the figure is the area covered by the existing geomembrane. The area shaded in darker green (approximately 15 acres) is Chiquita's proposed initial deployment. The area shaded in lighter green is the potential expansion area divided into five-acre segments. Other segments will receive geomembrane if Chiquita's Reaction Committee of experts determines pursuant to its monthly determinations that those segments are within the reaction area boundary (based on data review).³ The area shaded in purple is the data-driven reaction area, as determined by the Reaction Committee on May 9, 2025, based on April 2025 data.

Five-acre geomembrane deployment segments provide a practical working area. The quantity of geomembrane required for the deployment is large enough to be effective in controlling emissions but small enough to reduce procurement issues as well as limiting the size of impacts to continued gas collection and control system (GCCS) operation.

DTSC identified the following characteristics that the proposed geomembrane should possess:

- Accommodate landfill settlement/subsidence;
- Methane permeance less than 2.5×10^{-13} meters per second (m/s) per ASTM D1434;
- Durability to resist foot traffic wear, UV radiation, inclement weather, and motorized vehicles (if applicable);
- Properties to resist site-specific conditions including elevated landfill temperatures, settlement, and harmful gas/odor emissions; and
- Be no less than 40-mils thick.

The ISE Order also stipulates that the geomembrane be manufactured from materials consistent with the *Stark Memo* (Exhibit 6 of the ISE Order). That memo presented the following recommendations regarding the geomembrane:

- Manufactured as a composite material with an EVOH membrane sandwiched between layers of HDPE;
- Use a tan or green color;

³ The Reaction Committee's monthly determinations are submitted to South Coast AQMD and posted on Chiquita's Odor Mitigation website, at <https://chiquitacanyon.com/odor-mitigation/stipulated-order-for-abatement>.

- Underlay the geomembrane with a non-woven geotextile at least 6 ounces per square yard (oz/sy) unit weight;
- Continuously seamed and continuously tied into the existing 30-mil geomembrane;
- Possess a lifespan of at least 10 years;
- Textured on both sides;
- Withstand temperatures of at least 180° Fahrenheit; and
- Methane permeance of less than 2.5×10^{-13} m/s.

CEC contacted the following manufacturers to identify potentially suitable products:

- AGRU America;
- Viaflex;
- Western Environmental Liner;
- IWT Cargo-Guard;
- Earthshield Geosynthetics; and
- Layfield Group.

Only one of these manufacturers, Viaflex, had a product specifically incorporating the internal EVOH layer. None of the other manufacturers had a suitable product. The Layfield Group, for example, stated that their Enviro Liner 6060 geomembrane is a low-linear density polyethylene (LLDPE) and HDPE hybrid that would meet the performance standard, but they had concerns with seaming LLDPE geomembrane to Chiquita's existing HDPE geomembrane.

To meet the geomembrane requirements presented in the ISE Order, Chiquita intends to use the Absolute Barrier X60BCS produced by Viaflex. The manufacturer's product data sheet is provided in Appendix C. The membrane is co-extruded and textured on both sides. The exterior is comprised of HDPE and the inner core consists of an EVOH barrier resin. The entire geomembrane has a minimum thickness of 60 mils. The material can be produced in a range of colors, however, selection of a color will be based on availability and delivery times.

HDPE, in general, is a material that meets the requested properties listed by DTSC. The X60BCS with the EVOH inner core provides the desired methane permeance and heat resistance. Landfill settlement typically reduces strain on the geosynthetic components of a cover system. It is possible, however, that within the ETLF area the landfill could experience differential settlements that could induce large strains on the geosynthetic materials. To accommodate potentially large settlements, Chiquita has implemented an approved *Cover Monitoring and Maintenance Plan* (see Section 3.4, below) to identify conditions where the existing geomembrane is distressed and to promptly repair as needed. Chiquita will implement this same plan with respect to the additional geomembrane installed in accordance with this RAW.

Geomembrane will generally be installed as described in the *Third Revised Cover Installation Plan*, prepared by Chiquita, and submitted to USEPA on January 9, 2025, as Attachment D to the *Master Work Plan*. The boundary of the three initial deployment segments will be staked in the field by a surveyor and adjusted as needed by operations personnel to accommodate existing features (e.g., access roads) and infrastructure (e.g., LFG headers). The as-built location of the anchor trench for the existing geomembrane will also be identified in the field.

Preparation of the deployment area will include:

- Clear and grub/prepare the work area, including removing the green waste and vegetation;
- Prepare the subgrade to receive geomembrane;
- Regrade existing benches and slopes (as needed) to ensure proper drainage;
- Install vertical LFG collectors per the *Updated Design and Installation Schedule of the Gas Collection and Control System Well Field Expansion Plan* (Appendix D);
- Install surface LFG collectors to ensure proper distribution of vacuum to the underside of the geomembrane. This project will use the same surface collector design as that used for the existing geomembrane. The design is illustrated in Appendix E. Collector positions will be located in the field and spaced no greater than 100 feet apart;
- Toe drains will be installed for segments where geomembrane is installed on slopes. The toe drain will be located at the toe of the slope under the geomembrane and inside of the anchor trench. Temporary sumps will be located at the low end of each toe drain and connected to the LFG condensate system (the initial deployment area will not require any toe drains); and
- Disconnect and temporarily remove LFG headers and laterals in the deployment area.

Geomembrane installation will include:

- Geomembrane pipe boots around vertical collectors;
- Continuous seaming between the existing geomembrane and the new geomembrane;
- Placement of geotextile and gravel access roads where needed (locations will be determined in the field by operations personnel);
- Placement of sandbag ballast in other areas to prevent geomembrane uplift by wind;
- Re-installation of LFG headers and laterals over the geomembrane;

Similar to the final completion report submitted for the existing geomembrane cover, Chiquita will document construction in a completion report that includes surveyed limits of the cover and Construction Quality Assurance (CQA) data (see next section).

3.2 SCHEDULE

The nominal schedule for this work is presented below. This schedule is conservative but does not account for delays associated with weather or unforeseen conditions. The schedule assumes DTSC's approval of the RAW is received no later than June 16, 2025

Activity	Anticipated Duration	Estimated Completion Date
Geomembrane procurement	10 weeks	July 25, 2025
Segment 1 subgrade preparation	3 weeks	August 8, 2025
Segment 1 geomembrane deployment	2 weeks	August 22, 2025
Segment 1 surface finish and LFG tie-in	2 weeks	September 5, 2025
Segment 2 subgrade preparation	3 weeks	August 29, 2025
Segment 2 geomembrane deployment	2 weeks	September 12, 2025
Segment 2 surface finish and LFG tie-in	2 weeks	September 26, 2025
Segment 3 subgrade preparation	3 weeks	September 12, 2025

Segment 3 geomembrane deployment	2 weeks	September 26, 2025
Segment 3 surface finish and LFG tie-in	2 weeks	October 10, 2025
Completion Report	4 weeks	November 7, 2025

3.3 CONSTRUCTION QUALITY ASSURANCE PLAN

This section of the RAW addresses Section 5.3(o) of the ISE Order.

Construction quality assurance (CQA) will be performed in accordance with the Site's standard operating procedures and typical industry practices. Fill placed to regrade benches and for preparation of the subgrade will be compacted to at least 90 percent of the relative maximum density per ASTM D1557. Manufacturer's specifications for the X60BCS are provided in Appendix F. Installation specifications for the geomembrane, material and installation specifications for the geotextiles, and overall CQA requirements for the geosynthetic materials are provided in Appendix G. Pressure testing of carrier piping will be performed in accordance with ASTM F2164 or ASTM F2786, and a final completion report will be submitted.

3.4 REQUIRED PERMITS

This section of the RAW addresses Section 5.3(l) of the ISE Order.

At this time, it is believed that the actions required to implement this RAW are consistent with the current operating permits for the Site, which include

- Conditional Use Permit CUP 2004-00042-(5);
- Solid Waste Facilities Permit No. 19-AA-052;
- Waste Discharge Requirements Order No. 98-086; and
- SCAQMD Permit to Operate G43917

3.5 OPERATIONS AND MAINTENANCE PLAN

This section of the RAW addresses Section 5.3(m) of the ISE Order.

Operations and maintenance for the existing geomembrane cover is described in the *Operations and Maintenance Plan*, submitted to the LEA on May 9, 2025 (Appendix H), and incorporates by reference the *Revised Geomembrane Cover Monitoring and Maintenance Plan, Chiquita Canyon Landfill (Facility ID 119219), Castaic, California*, attached as an appendix to Chiquita's *Third Revised Cover Installation Plan*.

4.0 OTHER RAW ELEMENTS

The following sections provide additional information requested by DTSC in the ISE Order.

4.1 EQUIPMENT AND PROPOSED TRAVEL ROUTES

This section of the RAW addresses Section 5.3(h) and (j) of the ISE Order.

The untreated leachate is considered contaminated material for purposes of this RAW. No leachate is expected to be handled or otherwise managed as part of the work performed under this RAW.

4.2 SAMPLING AND ANALYSIS PLAN

This section of the RAW addresses Section 5.3(d) and (i) of the ISE Order.

For the purposes of this RAW, sampling and analysis is limited to treated and untreated leachate and rinsate from cleaning the tanks and equipment. No untreated leachate or rinsate is expected to be handled or otherwise managed as part of the work performed under this RAW.

4.3 HEALTH AND SAFETY PLAN

This section of the RAW addresses Section 5.3(e) and (k) of the ISE Order.

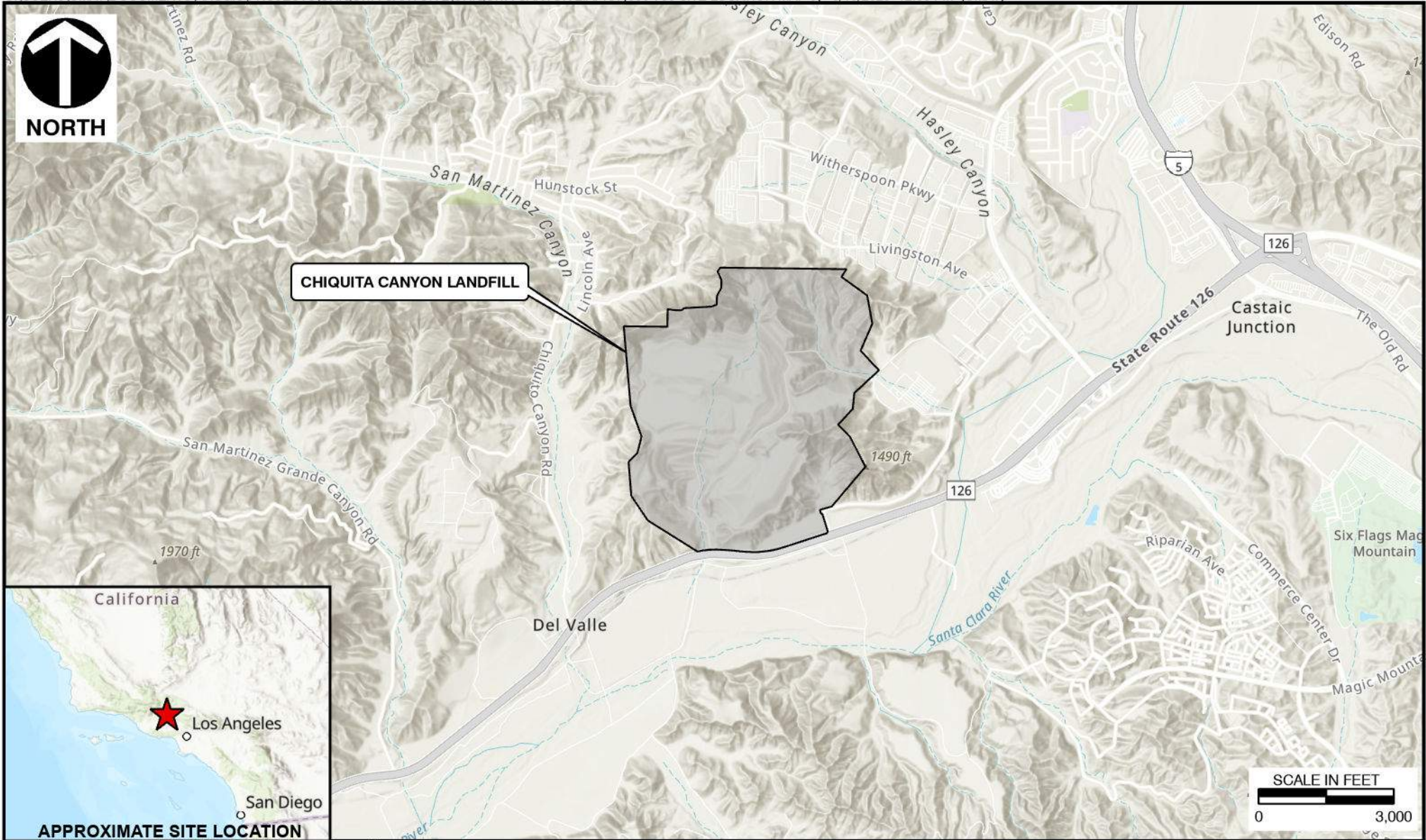
The current site *ETLF Operations Health and Safety Plan Version 2.2* is provided in Appendix I.

4.4 CONSTRUCTION AIR MONITORING PLAN

This section of the RAW addresses Section 5.3(f) of the ISE Order.

The actions taken to implement this RAW are consistent with the ongoing landfill operations related to the ETLF event and are addressed in the current *Chiquita Canyon Landfill Odor Mitigation Plan (Revision 1.01)*, which is provided in Appendix J.

FIGURES



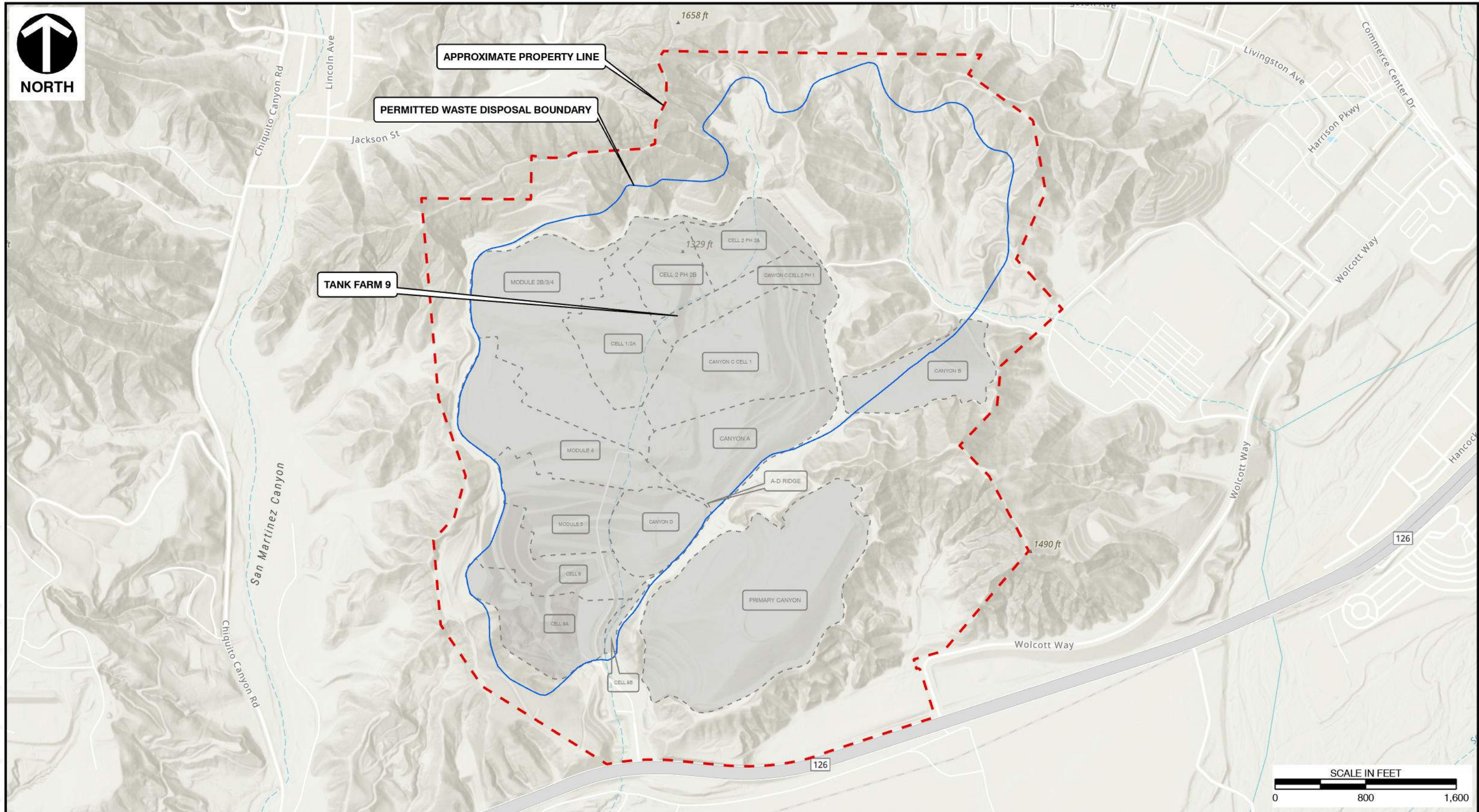
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www.cecinc.com

REMOVAL ACTION WORKPLAN
EXTENSION OF COVERED AREA
CHIQUITA CANYON LANDFILL

SITE LOCATION MAP

DRAWN BY:	CMM	CHECKED BY:	RVH	APPROVED BY:	RVH	FIGURE NO:	1
DATE:	5/15/2025	SCALE:	1" = 3,000'	PROJECT NO:	350-750		



LEGEND

- - - - - APPROXIMATE PROPERTY BOUNDARY
- REFUSE LIMIT
- - - - - CELL LIMIT
- CONSTRUCTED CELL



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REMOVAL ACTION WORKPLAN
EXTENSION OF COVERED AREA
CHIQUITA CANYON LANDFILL

SITE PLAN

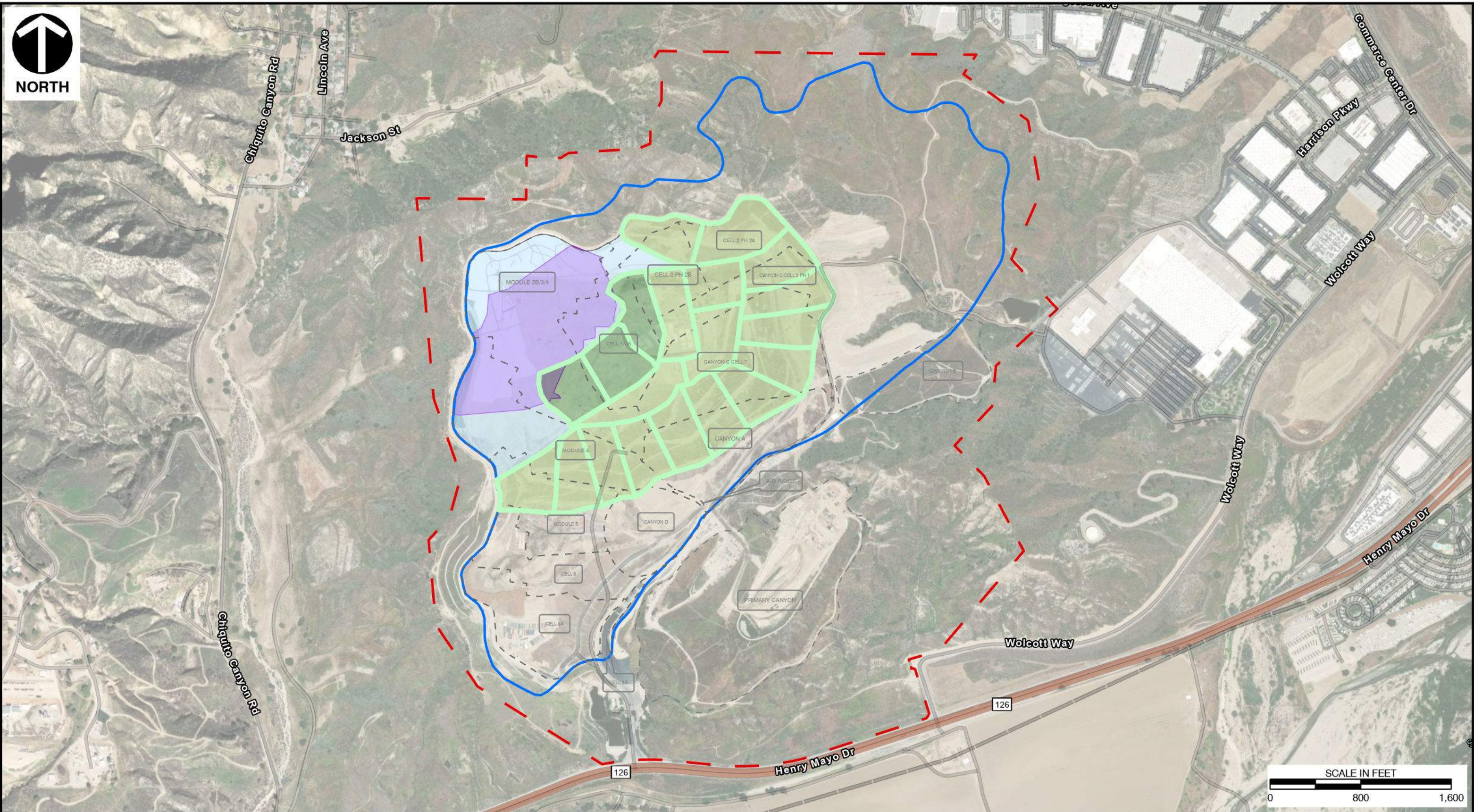
DRAWN BY: CMM
DATE: 5/15/2025

CHECKED BY: RVH
SCALE: 1" = 800'

APPROVED BY: RVH
PROJECT NO: 350-750

FIGURE NO: 2

*Hand Signature on file



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- REFUSE LIMIT
- - - CELL LIMIT
- EXISTING GEOMEMBRANE DEPLOYMENT AREA

- INITIAL SUPPLEMENTAL GEOMEMBRANE DEPLOYMENT AREA
- SUBSEQUENT SUPPLEMENTAL GEOMEMBRANE DEPLOYMENT AREAS
- REACTION AREA

NOTES:

1. EXISTING GEOMEMBRANE DEPLOYMENT AREA IS APPROXIMATELY 45.9 ACRES.
2. EXISTING GEOMEMBRANE IS 30-MIL HDPE, EXCEPT FOR 1.3 ACRES OF 40-MIL HDPE.
3. EACH PROPOSED DEPLOYMENT AREA IS APPROXIMATELY 5 ACRES.
4. NEW GEOMEMBRANE WILL BE 60-MIL HDPE WITH AN INTERNAL CORE EVOH RESIN BARRIER.



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DRAWN BY: CMM
DATE: 5/15/2025

CHECKED BY: RVH
SCALE: 1" = 800'

APPROVED BY: RVH
PROJECT NO: 350-750

REMOVAL ACTION WORKPLAN
EXTENSION OF COVERED AREA
CHIKUITA CANYON LANDFILL

PROPOSED AND POTENTIAL
GEOMEMBRANE DEPLOYMENT AREAS

FIGURE NO: **3**

*Hand Signature on file

APPENDIX A
EXTENT OF REACTION AREA AS OF APRIL 2025

May 9, 2025
File No. 01204123.21-13

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

Subject: Monthly Reaction Committee Determination on Reaction Area Boundary
Chiquita Canyon Landfill – Castaic, California

Dear Mr. Chen:

In accordance with Condition Nos. 9a and 9b of the Modified Stipulated Order for Abatement (SOFA) pertaining to the Chiquita Canyon Landfill (Landfill or Facility) (Case No. 6177-4), the Reaction Committee has reviewed newly acquired applicable data recorded during the month of April 2025, considered revisions of the estimated extent of elevated temperature landfill (ETLF) conditions exhibited at the subject Facility (referred to as the “Reaction Area” limits), and has prepared this determination on potentially revising the Reaction Area map.

Attachment A presents the Drawing, titled “Reaction Area Map”, prepared by SCS Engineers (SCS) and dated 5/5/25. The Drawing depicts the Reaction Area boundary as prescribed in Condition No. 9a, which corresponds to the limits of Cells 1/2A, 2B/3, 4, and Module 2B/3/4 P2, as a solid black line. The Drawing also depicts the estimated extent of ETLF conditions being experienced at the site based on the Reaction Committee’s review of scientific data as a dashed magenta line. The rationale that serves as the basis for considering adjustments and modifications to the Reaction Area boundary (or the determination to maintain the decreed boundary), include the following:

- LFG wellhead temperatures in excess of approximately 160 degrees Fahrenheit.
- Poor gas quality (defined as methane levels of less than 30 percent) in conjunction with methane-to-carbon dioxide (CH₄:CO₂) ratios less than 1.0.
- The concentration of hydrogen (H₂) in the LFG measured greater than 2 percent by volume.
- The concentration of carbon monoxide (CO) in the LFG measured greater than 2,000 ppm.
- Accelerated settlement of the landfill surface, defined as approximately 18 inches or greater within a 60-day period, and cracks in landfill cover. This corresponds to a strain value (i.e., settlement rate) rate of 3 percent per year for areas with a 300-foot waste column depth, which we believe is a reasonable average depth in the subject area of interest.
- First-hand observations of Landfill and/or SCS engineering, construction, and operations and maintenance (O&M) field personnel who are on-site related to: 1) atypical excess leachate quantities (presence and quantity of liquids); 2) instances of pressurized liquids emitting from the landfill surface, from boreholes during drilling, and from LFG wells; and, 3) the characteristics of the odors originating from the select areas of the waste footprint (often



described as “chemical-like” and distinctly different from typical LFG or landfill working face odors).

- Observations of subsurface waste conditions and characteristics as noted on borehole drilling logs for recently installed new wells and/or probes.
- Subsurface temperatures recorded at the in-situ waste temperature probes during April 2025.
- Temperature of gas or liquids measured at depth within the LFG well riser pipe (using an automated transmitter or manual field instrumentation).
- Since there were no drilling activities for new waste temperature probes during April 2025, there was no new data related to subsurface temperature and pressures associated with drilling.

CONSIDERATIONS FOR POTENTIAL ADJUSTMENTS TO THE ESTIMATED EXTENT OF ETLF CONDITIONS (DASHED MAGENTA LINE)

In making its monthly determinations, the Reaction Committee evaluates the above set of data parameters, in conjunction with one another, to identify meaningful trends indicating ETLF conditions, as opposed to fluctuations exhibited in isolated datapoints.

Each month, the Reaction Committee scrutinizes particular areas of the Landfill that have previously exhibited abnormal or fluctuating data, when applicable. As discussed below, despite minor variances in discrete areas of the landfill, the Committee has not discerned any meaningful trends with respect to the April 2025 data that would indicate the reaction has expanded into these areas.

Near CV-24083

During multiple monitoring events in March and April, well CV-24083 exhibited an average methane concentration of approximately 26 percent and an average LFG wellhead temperature of approximately 162 degrees Fahrenheit. At the adjacent well CV-24070, which is positioned closer to the current estimated extent of ETLF conditions (dashed magenta line) than CV-24083, the methane concentrations recorded during March and April averaged 33 percent and the temperatures averaged 136 degrees F. A review of the monitoring data recorded at three other wells adjacent to CV-24083 (CV-24071, CV-24082, and CV-24084) indicates that these three wells exhibited average wellhead temperatures below 145 degrees F during March and April. Furthermore, the maximum methane concentrations recorded at these three wells during this timeframe are between 42 and 49 percent, suggesting significant methanogenic activity is occurring. Accordingly, at this time, the Reaction Committee believes that no adjustment to the estimated extent of ETLF conditions in this discrete location is warranted, since the data recorded in April does not appear to signal a potential expansion of the subsurface reaction.

Near CV-24084 & TP-11

Considering the increasing temperatures recorded by the thermocouples at various depth intervals in TP-11 over the past several months, the Reaction Committee carefully considered the operating

parameters recorded at the co-located well CV-24084, along with conditions at adjacent wells CV-24071 and CV-24156. While the 30-day maximum temperature recorded at the 100-foot interval in TP-11 is 172 degrees F, the average LFG temperature at the co-located well CV-24084 is less than 145 degrees F. While the average methane concentration exhibited at well CV-24084 during multiple monitoring events in March and April of 20 percent is suppressed, a methane content of 42 percent was recorded on April 8th. The hydrogen concentrations at CV-24084 was 6.8 percent. The gas composition and temperatures at adjacent well CV-24156 are clearly inconsistent with ETLF conditions (methane content near 50 percent and temperatures less than 119 degrees). While adjacent well CV-24071 exhibited hydrogen greater than 2 percent, the average methane concentrations above 35 percent and low temperature values (below 130 degrees F) are likewise inconsistent with ETLF conditions. Accordingly, the Reaction Committee does not believe that any adjustment to the estimated extent of ETLF conditions in this discrete location is warranted at this time, since the data recorded in April does not appear to consistently signal a potential expansion of the subsurface reaction.

Near TP-24, TP-26, TP-29, TP-30, TP-31, and TP-32

On or about April 1, 2025, the Reaction Committee received documentation, prepared by Dr. Timothy D. Stark, Ph.D, PE, BC.GE and dated February 26, 2025, titled "Comments on November 26, 2024 Revised Soil Reaction Break/Barrier Plan and February 20, 2025 Waste Temperature Data for Chiquita Canyon Landfill Subsurface Elevated Temperature (SET) Event". This document was included as Exhibit 6 in the California Environmental Protection Agency Department of Toxic Substances and Control Imminent and Substantial Endangerment Determination and Order, effective April 2, 2025. Figure 2 of this document presented a delineation of the SET Event that is inclusive of temperature monitoring probes TP-7, TP-29, TP-30, TP-31, and TP-32. The Reaction Committee reviewed the in-situ waste temperatures recorded at these five probes, as well as probe TP-24, and evaluated the surrounding LFG wells and field conditions in relation to the rationale that serves as the basis for considering adjustments and modifications to the Reaction Area boundary that are cited above. Based on this evaluation, there does not appear to be evidence of a potential expansion of the subsurface reaction into the portions of the waste mass along the delineation presented in Figure 2. Accordingly, the Reaction Committee does not believe that any adjustment to the estimated extent of ETLF conditions in this discrete location is warranted at this time, since the data recorded in April does not appear to consistently signal a potential expansion of the subsurface reaction

TEMPERATURE MONITORING PROBE DATA

The Reaction Committee reviewed the temperature measurements recorded during April 2025 by the in-situ temperature monitoring probes. As of April 2025, five (5) of the thirty-two (32) probes (TP-2, 3, 9, 15, and 21) are located within the current estimated extent of ETLF conditions (dashed magenta line). Of the remaining twenty-seven (27) probes positioned outside of the boundary, twelve (12) probes are positioned within relatively close proximity (within 200 feet) of this boundary. It is the Committee's opinion that the temperatures recorded by the 27 probes outside of the boundary during April 2025 are not indicative of a subsurface reaction and do not substantiate a decision to adjust the boundary of the reaction area at this time. Chiquita's submittal of temperature measurements to the Local Enforcement Agency, dated May 1, 2025, explained that the sensors in TP-06 *"were evaluated and found to have had errors and failures since being brought back online*

from filling operations. The failed sensors were replaced and re-wired on April 4th. The maximum recorded temperature at TP-06 since the replacement and re-wiring is 138°F.”

The Reaction Committee evaluated the 30-day maximum temperatures recorded in TP-26 (173 degrees Fahrenheit at the 160-foot interval), TP-29 (183 degrees F at the 250-foot interval), TP-30 (170 degrees F at the 200-foot interval), and TP-31 (185 degrees F at the 190-foot interval). The Committee noted differentiation between the 30-day maximum temperatures in these four probes compared to the 30-day maximum temperatures measured at the three probes within the current estimated extent of ETLF conditions (dashed magenta line), specifically TP-3 (233 degrees F at 45-foot interval), TP-9 (223 degrees at the 125-foot interval), and TP-21 (257 degrees at the 110-foot interval). Based on this differentiation, along with consideration of the other relevant criteria and data parameters, the Reaction Committee does not believe an adjustment to the boundary of the reaction area to include the portions of the waste footprint inclusive of TP-26, TP-29, TP-30, and TP-31 is warranted at this time.

HYDROGEN CONCENTRATIONS

The Reaction Committee also evaluated the concentration of hydrogen in landfill gas (LFG) during April 2025. Recall that certain wells positioned to the south and east of the reaction area boundary (where dewatering pumping was reactivated) have periodically demonstrated some increased hydrogen content in the LFG during the Reaction Committee’s review of the data in previous months, which similarly was the case for the April data. The Reaction Committee noted in its review of the data that these wells did not exhibit elevated temperatures, except for one isolated instance at well CV-24083. The most recent measurements recorded at this well confirm that sustained elevated temperature values have not been exhibited at this time and the maximum methane content during the past two months of 37 percent indicates that methanogenesis is still occurring. Other than the value at this well, there was no evidence of the increased heat that is typical with ETLF conditions present at the wells exhibiting atypical hydrogen concentrations. As noted previously, the Committee suspects this increased hydrogen content may be attributable to substantial dewatering being accomplished throughout the Reaction Area and may be associated with gas movement from within the Reaction Area by existing horizontal collectors in close proximity. Thus, the presence of elevated hydrogen in these isolated locations does not suggest that ETLF conditions are expanding south and east of the delineated boundary. Accordingly, the Reaction Committee does not believe an adjustment to the boundary of the reaction area is warranted at this time.

CONCLUSION

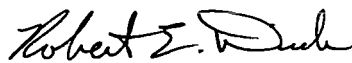
As presented on the Drawing included as **Attachment A**, the estimated extent of ETLF conditions (dashed magenta line) is fully contained within the Reaction Area boundary decreed in the SOFA (solid black line). Because the ETLF conditions are fully contained within the Reaction Area boundary and have not expanded into a new cell, the Reaction Committee finds no basis to modify the Reaction Area boundary as prescribed in Condition 9a at this time.

There was no dissenting opinion among the Reaction Committee members regarding this monthly determination. Supporting data is presented on the Drawing included as **Attachment A**. The maximum temperature measurements recorded at the 32 in-situ waste temperature monitoring probes during April are presented in **Attachment B** in graphical format. The landfill gas wellhead temperatures recorded at the extraction wells for the entire landfill footprint are reflected on the

isothermal gradient range map presented as **Attachment C**. The carbon monoxide (CO) concentrations measured at the landfill gas wellheads in the vicinity of the data-driven reaction area boundary are depicted on the range map presented as **Attachment D**. The electronic database and recordkeeping platform enables these measurements to be downloaded into a tabular spreadsheet format, which can be submitted to the South Coast Air Quality Management District under separate cover, if requested.

Please contact either of the undersigned if you have questions or require additional information.

Sincerely,



Robert E. Dick, PE, BCEE
Senior Vice President
SCS Engineers



Patrick S. Sullivan, BCES, CCP
Senior Vice President
SCS Engineers

RED/PSS

cc: Nathaniel Dickel, SCAQMD
Christina Ojeda, SCAQMD
Pablo Sanchez Soria, PhD, CIH, CTEH
Neal Bolton, PE, Blue Ridge Services, Inc.
Richard Pleus, PhD, Intertox
Srividhya Viswanathan, PE, SCS Engineers

Enclosures:

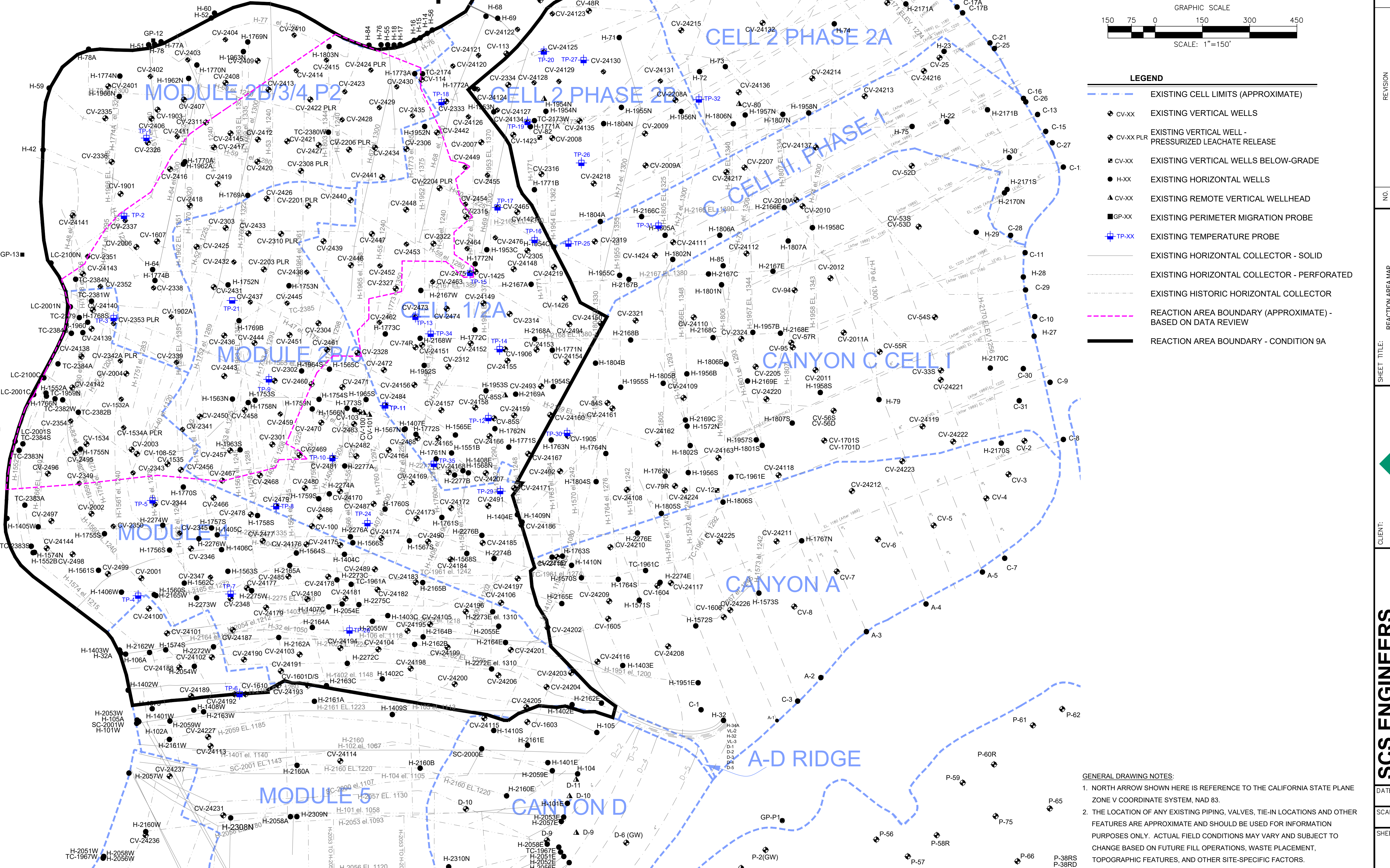
Attachment A – Reaction Area Map
Attachment B – In-Situ Waste Temperature Monitoring Probe Data
Attachment C – Isothermal Gradient Range Map
Attachment D – Wellhead Carbon Monoxide Range Map

LEGEND

- EXISTING CELL LIMITS (APPROXIMATE)
- EXISTING VERTICAL WELLS
- EXISTING VERTICAL WELL - PRESSURIZED LEACHATE RELEASE
- EXISTING VERTICAL WELLS BELOW-GRADE
- EXISTING HORIZONTAL WELLS
- EXISTING REMOTE VERTICAL WELLHEAD
- EXISTING PERIMETER MIGRATION PROBE
- EXISTING TEMPERATURE PROBE
- EXISTING HORIZONTAL COLLECTOR - SOLID
- EXISTING HORIZONTAL COLLECTOR - PERFORATED
- EXISTING HISTORIC HORIZONTAL COLLECTOR
- REACTION AREA BOUNDARY (APPROXIMATE) - BASED ON DATA REVIEW
- REACTION AREA BOUNDARY - CONDITION 9A


GENERAL DRAWING NOTES:

- NORTH ARROW SHOWN HERE IS REFERENCE TO THE CALIFORNIA STATE PLANE ZONE V COORDINATE SYSTEM, NAD 83.
- THE LOCATION OF ANY EXISTING PIPING, VALVES, TIE-IN LOCATIONS AND OTHER FEATURES ARE APPROXIMATE AND SHOULD BE USED FOR INFORMATION PURPOSES ONLY. ACTUAL FIELD CONDITIONS MAY VARY AND SUBJECT TO CHANGE BASED ON FUTURE FILL OPERATIONS, WASTE PLACEMENT, TOPOGRAPHIC FEATURES, AND OTHER SITE-SPECIFIC FACTORS.



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<div>SCS ENGINEERS</div> <div>ENVIRONMENTAL CONSULTANTS</div> <div>3900 KILROY AVENUE SUITE 300</div> <div>LONG BEACH, CA 90806</div> <div>PH: (562) 426-5654</div>	CLIENT:				SHEET TITLE: REACTION AREA MAP APRIL 2025		NO. △ △ △ △ △ △	REVISION	DATE
	<div></div> <div>CHIQUITA CANYON LANDFILL CASTAIC, CALIFORNIA</div>				PROJECT TITLE: CHIQUITA CANYON LANDFILL CASTAIC, CALIFORNIA				
					DATE: 05/05/2025				
SCALE: AS SHOWN									
SHEET: 1									

ATTACHMENT B

Solid Waste Borehole Maximum Temperature Profiles Over 6 Weeks for 3/20/2025 to 4/30/2025

From April 24, 2025, through April 30, 2025, there were two recorded temperature increases and two temperature decreases that triggered the notification limits set forth in the LEA's October 4, 2024 letter.

Additionally, as of April 4, 2025, twelve new TMPs (TMP-21, TMP-24, TMP-25, TMP-26, TMP-27, TMP-28, TMP-29, TMP-30, TMP-31, TMP-32, TMP-34, and TMP-35) have been installed and are online. None of these twelve new TMPs indicate reaction temperatures occurring outside of the currently delineated data-driven reaction area boundary, and the four TMPs that were able to be drilled to within 25 feet of the liner (TMP-24, TMP-27, TMP-31, and TMP-32) show significantly cooler temperatures at the deepest thermocouple, as expected due to the cooling from the underlying earth. This data further supports the previous conclusions of cooler temperatures near the liner and the liner's integrity being uncompromised by elevated temperatures.

Chiquita provides the following updates:

- TP-06
 - As stated in last week's report, during field investigation of TP-06, the thermocouples were evaluated and found to have had errors and failures since being brought back online from filling operations. Any temperature readings from the date that the thermocouples were brought back online were likely erroneous and any decreases or increases in temperatures were in error. The failed sensors were replaced and re-wired on April 4th. The maximum recorded temperature at TP-06 since the replacement and re-wiring is 138°F. However, the 100-foot thermocouple was reading in error and has been evaluated. After a below grade evaluation of TP-06, the 2-inch casing was found to be bent which was causing the 100-foot thermocouple to no longer read temperatures. On April 23rd a new thermocouple was attempted to be installed but could not be advanced beyond 20 feet due to issues causing thermocouple not being able to be removed or re-installed beyond repairable depth. On April 29th field crews were able to reinsert the 100-foot thermocouple by removing all thermocouples and re-installing them together. Note that the vertical temperature profile for TP-06 will be corrected in future weeks when we have multiple weeks of correct data and no past data issues that throw off previous weeks graphs.
- TP-09
 - The past week of readings at TP-09 have shown no variability and upon field investigation, the battery for TP-09 was found to have failed likely due to poor cell network connection rapidly draining the battery. A new battery will be ordered and re-installed as soon as reasonably possible.
- TP-15
 - The 30-foot thermocouple showed an increase in maximum temperature of 15°F from 171°F to 186°F from April 23rd to April 26th, then a decrease in maximum temperature of 25°F from 186°F to 161°F from April 26th to April 28th, and then an increase in maximum temperature of 21°F from 161°F to 182°F from April 28th to April 30th, for an overall increase in maximum temperature of 11°F.
- TP-21
 - The 85-foot thermocouple showed a decrease in maximum temperature of 11°F from 221°F to 210°F from April 23rd to April 27th.

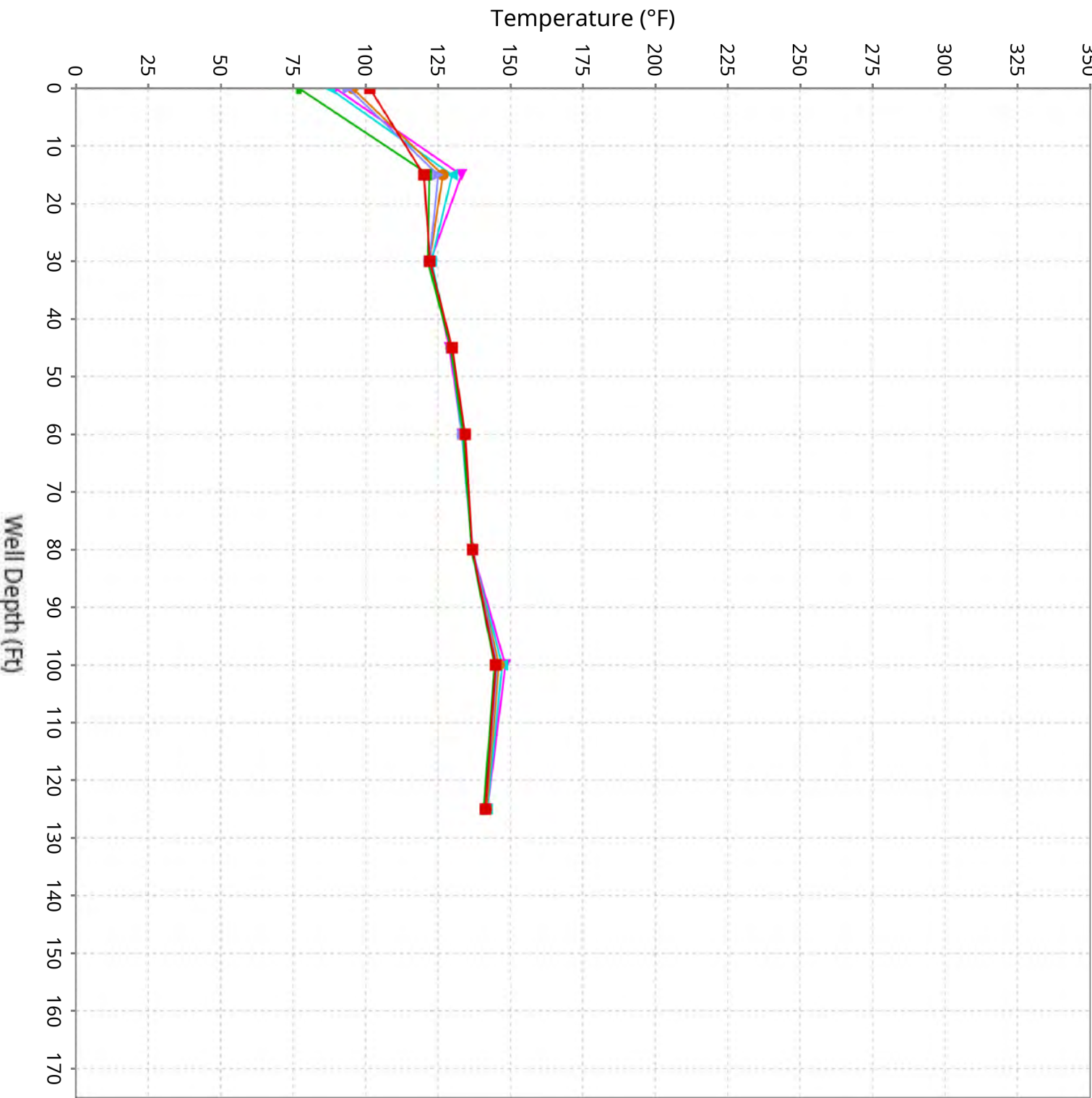
SCS ENGINEERS

07224053.00 | May 1, 2025

274 Granite Run Drive
Lancaster, PA 17601
717-550-6330

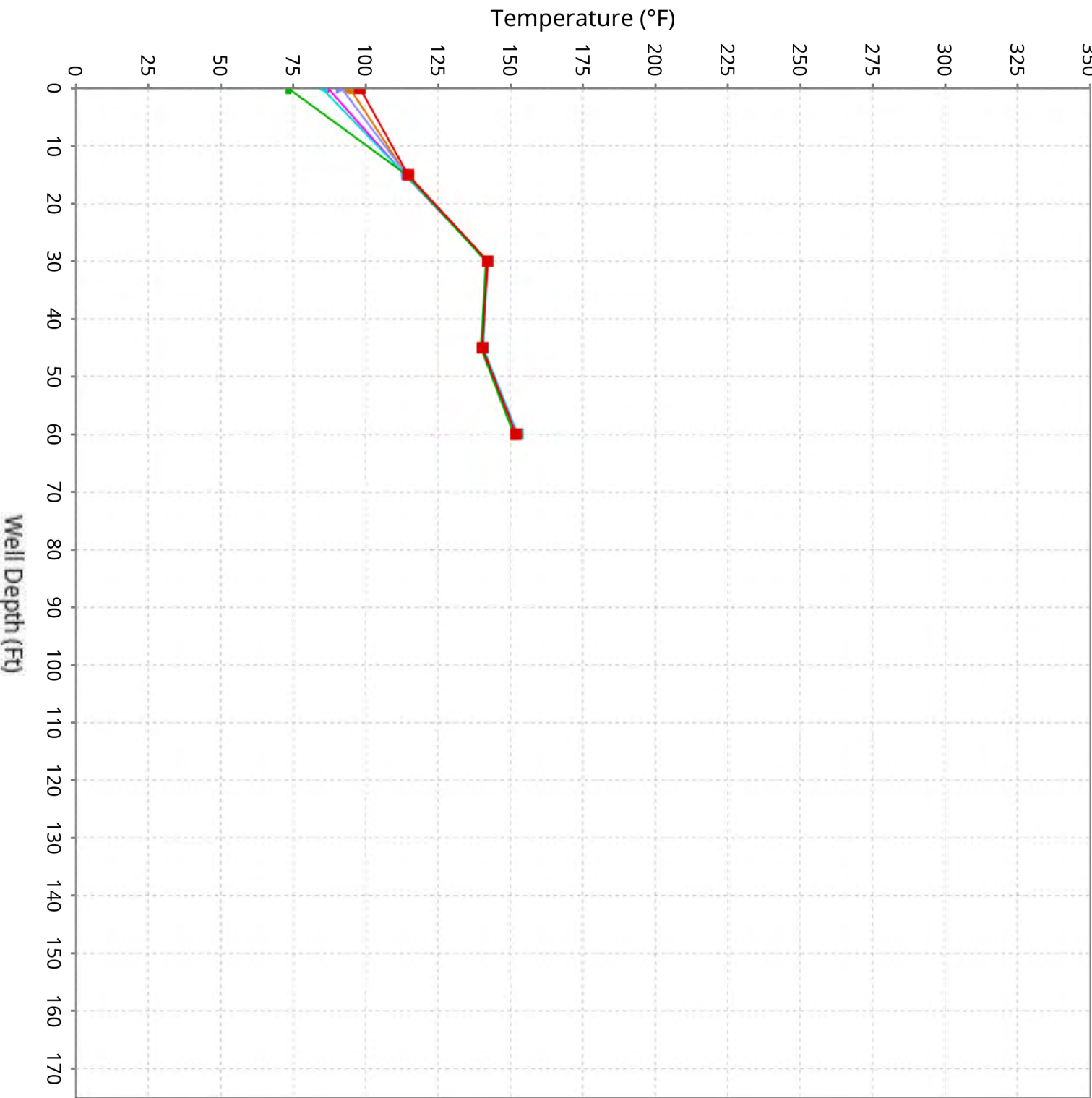
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-1

Maximum data for 3/20/2025 to 4/30/2025



Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-2

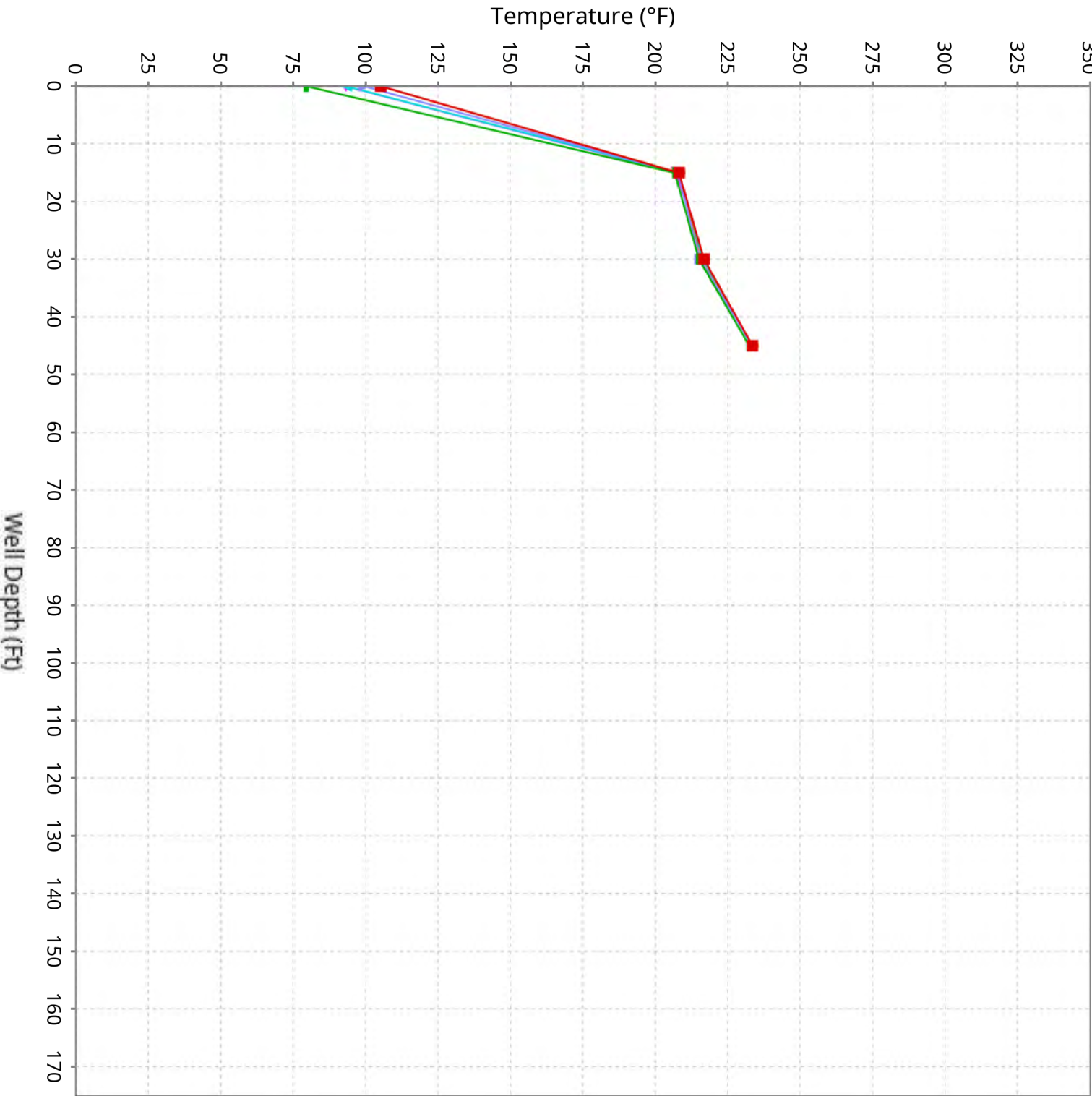
Maximum data for 3/20/2025 to 4/30/2025



3/20/25-3/27/25 3/27/25-4/3/25 4/3/25-4/10/25 4/10/25-4/17/25 4/17/25-4/24/25 4/25/25-4/30/25

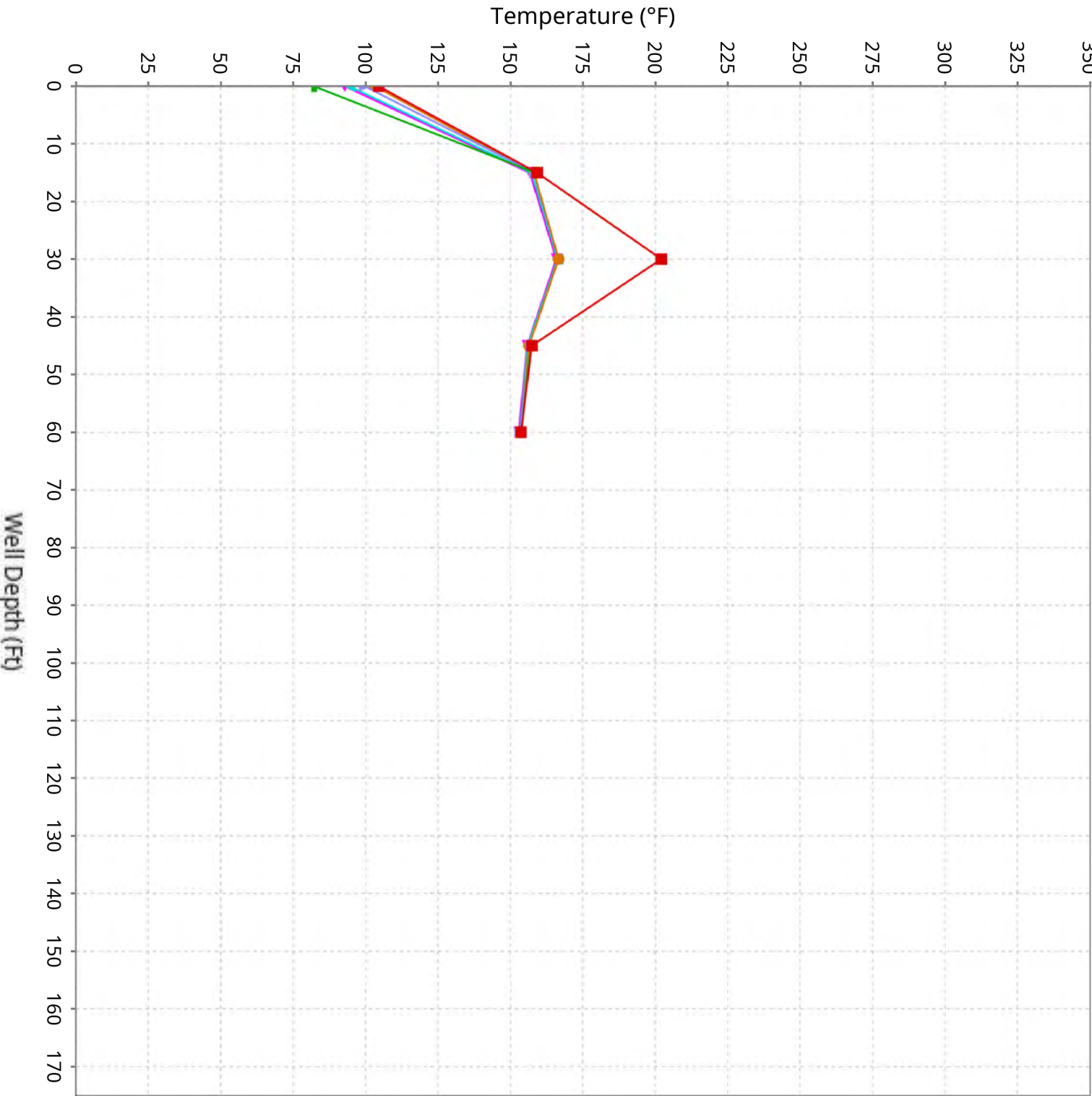
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-3

Maximum data for 3/20/2025 to 4/30/2025



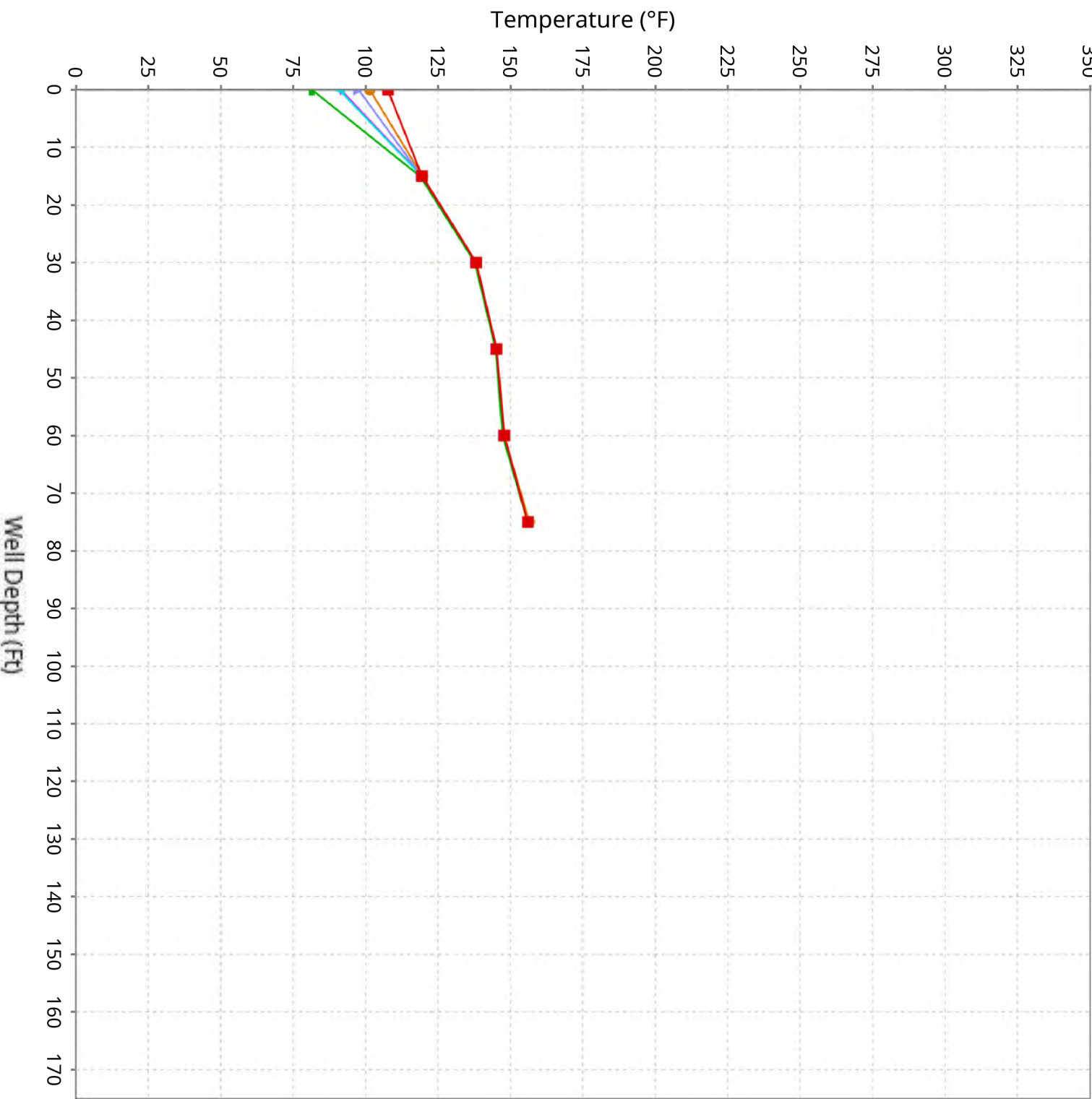
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-4

Maximum data for 3/20/2025 to 4/30/2025



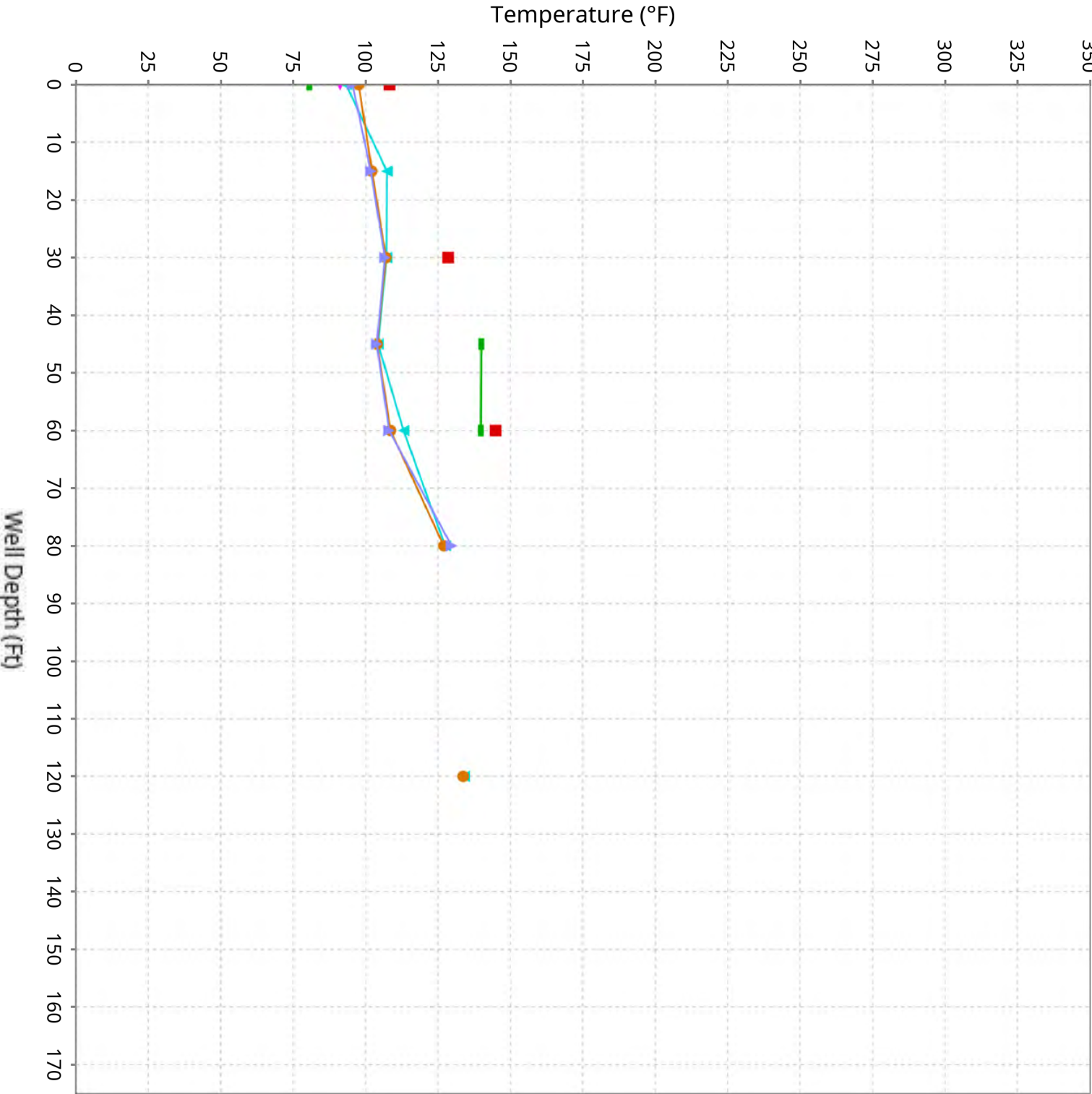
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-5

Maximum data for 3/20/2025 to 4/30/2025



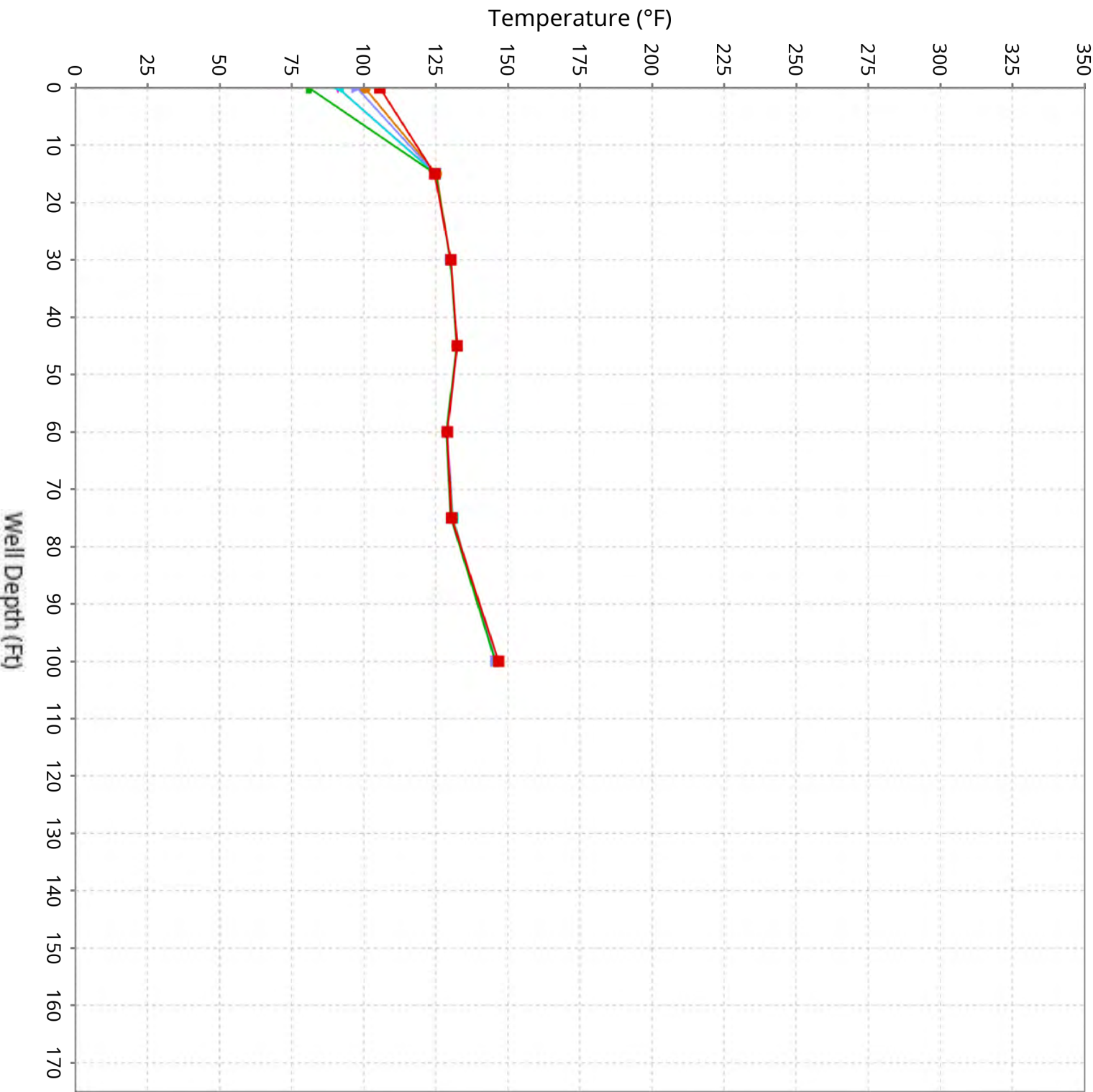
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-6

Maximum data for 3/20/2025 to 4/30/2025



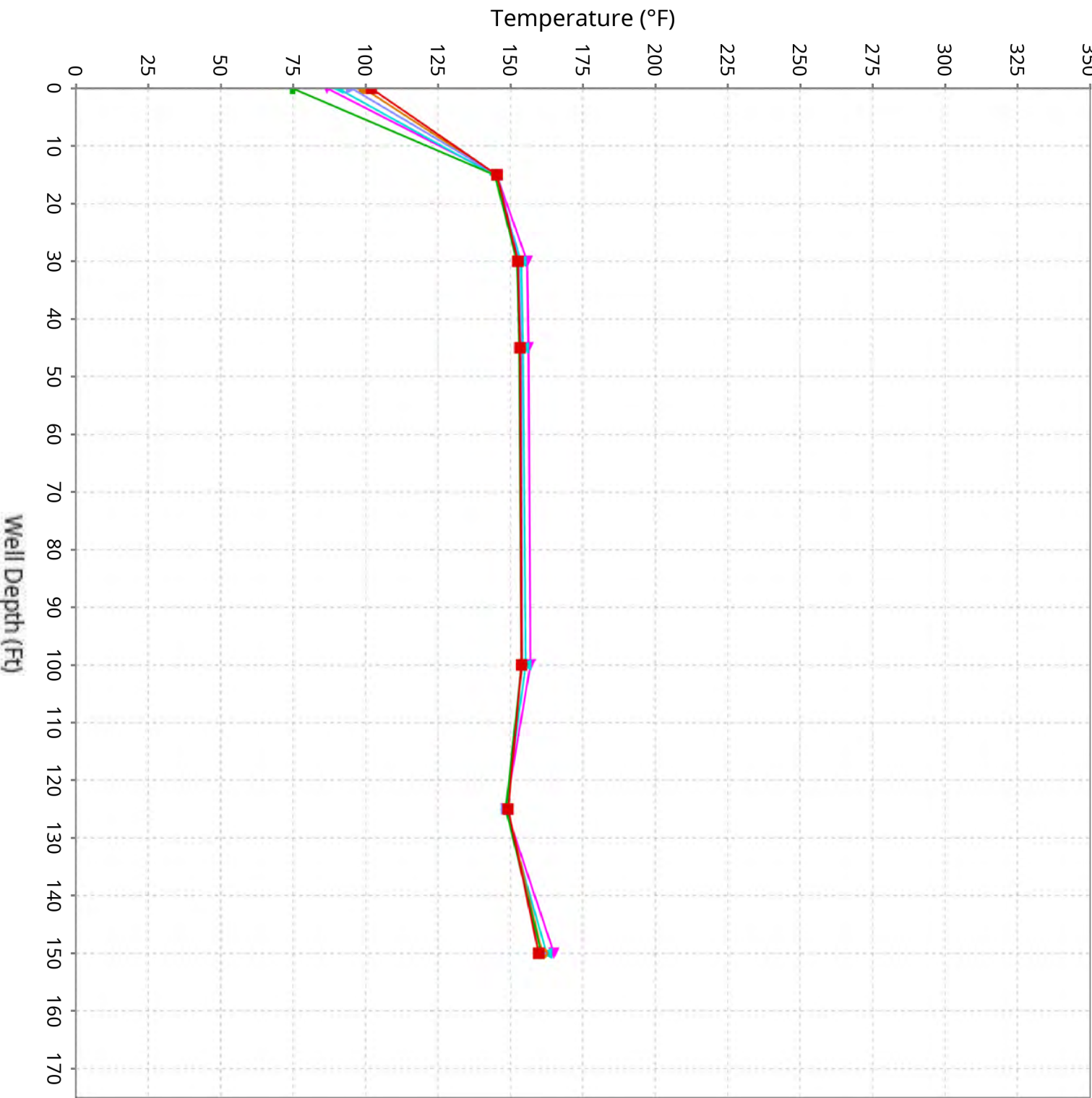
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-7

Maximum data for 3/20/2025 to 4/30/2025



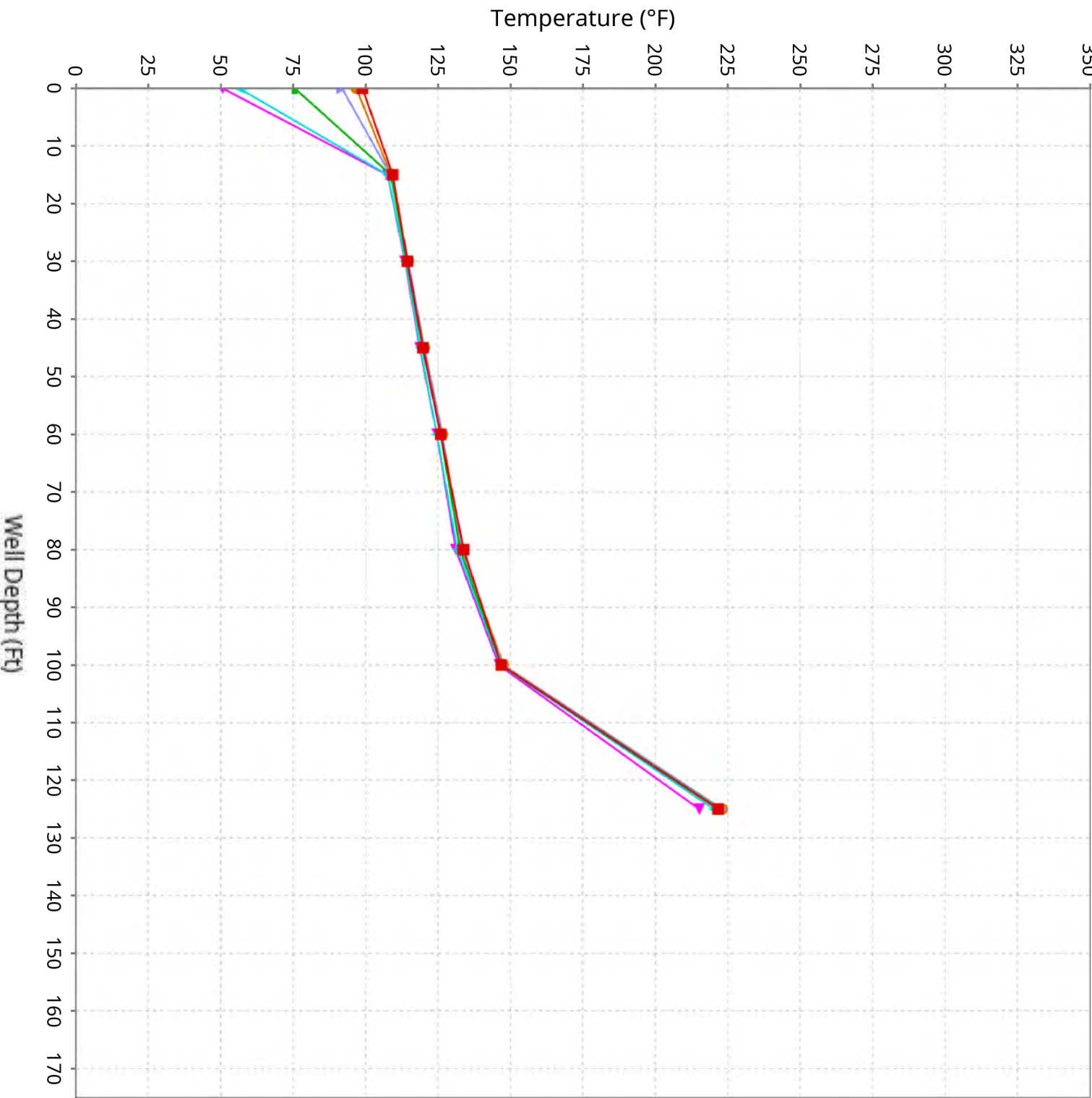
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-8

Maximum data for 3/20/2025 to 4/30/2025



Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-9

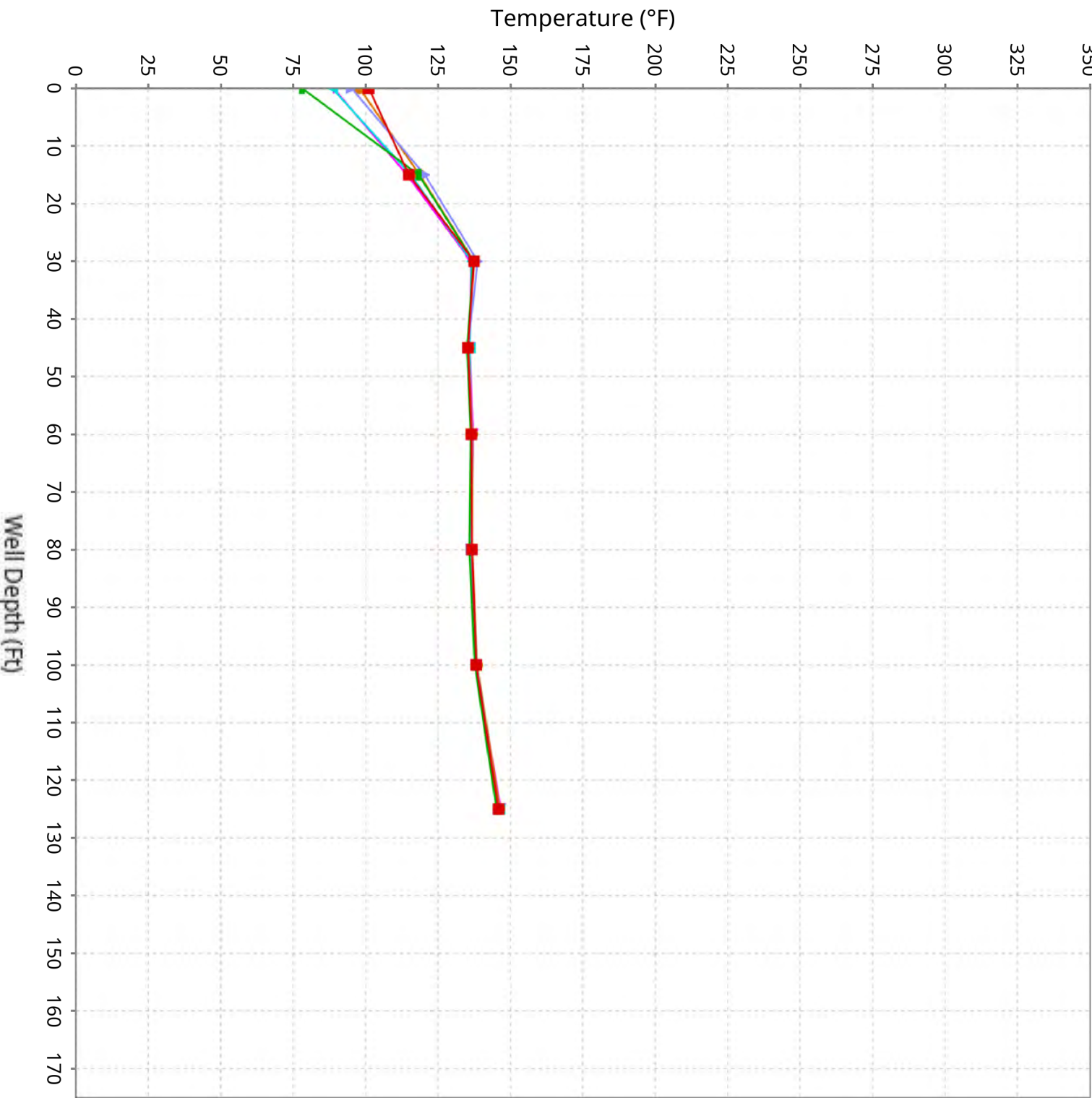
Maximum data for 3/20/2025 to 4/30/2025



3/20/25-3/27/25 3/27/25-4/3/25 4/3/25-4/10/25 4/10/25-4/17/25 4/17/25-4/24/25 4/25/25-4/30/25

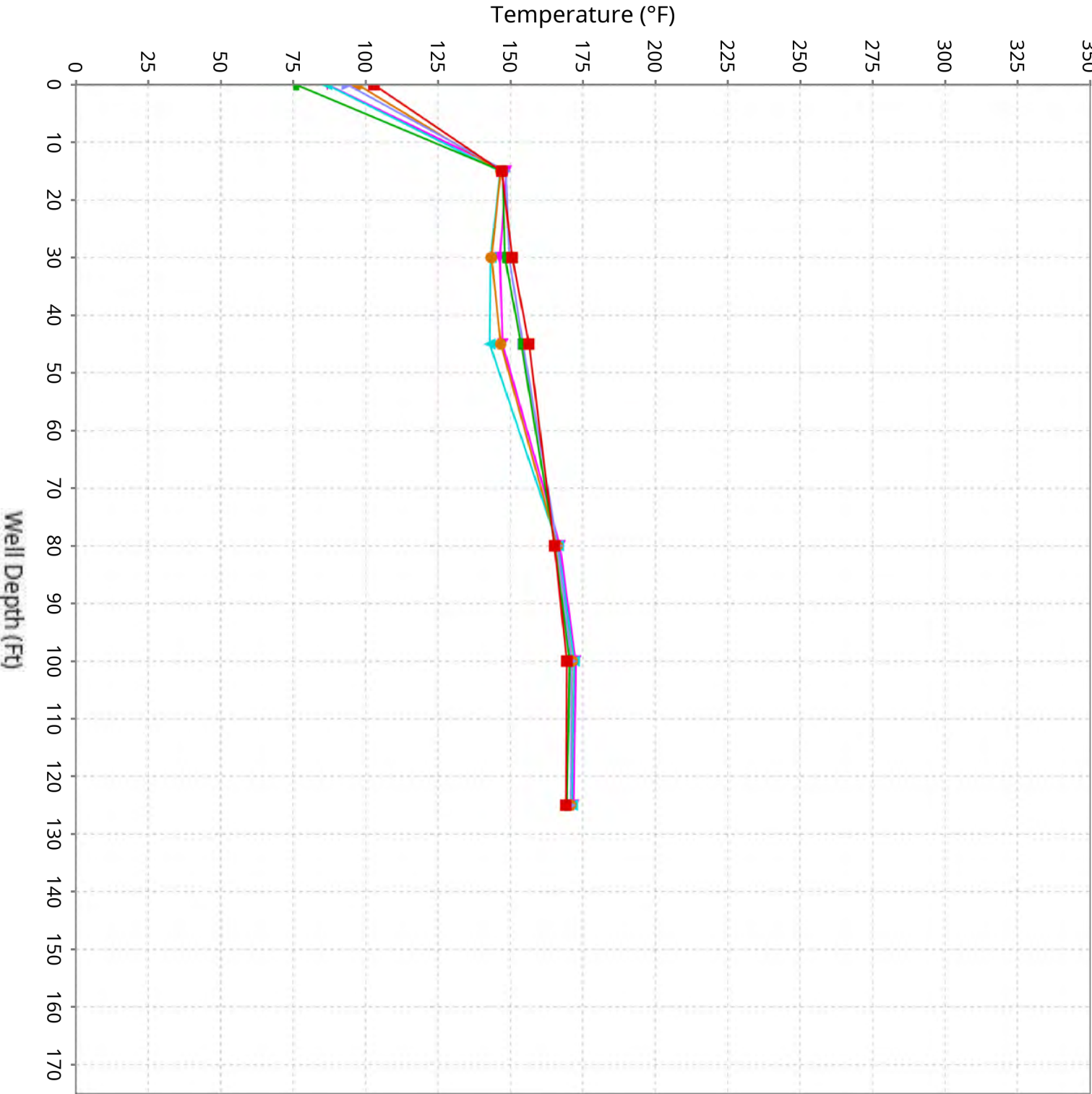
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-10

Maximum data for 3/20/2025 to 4/30/2025



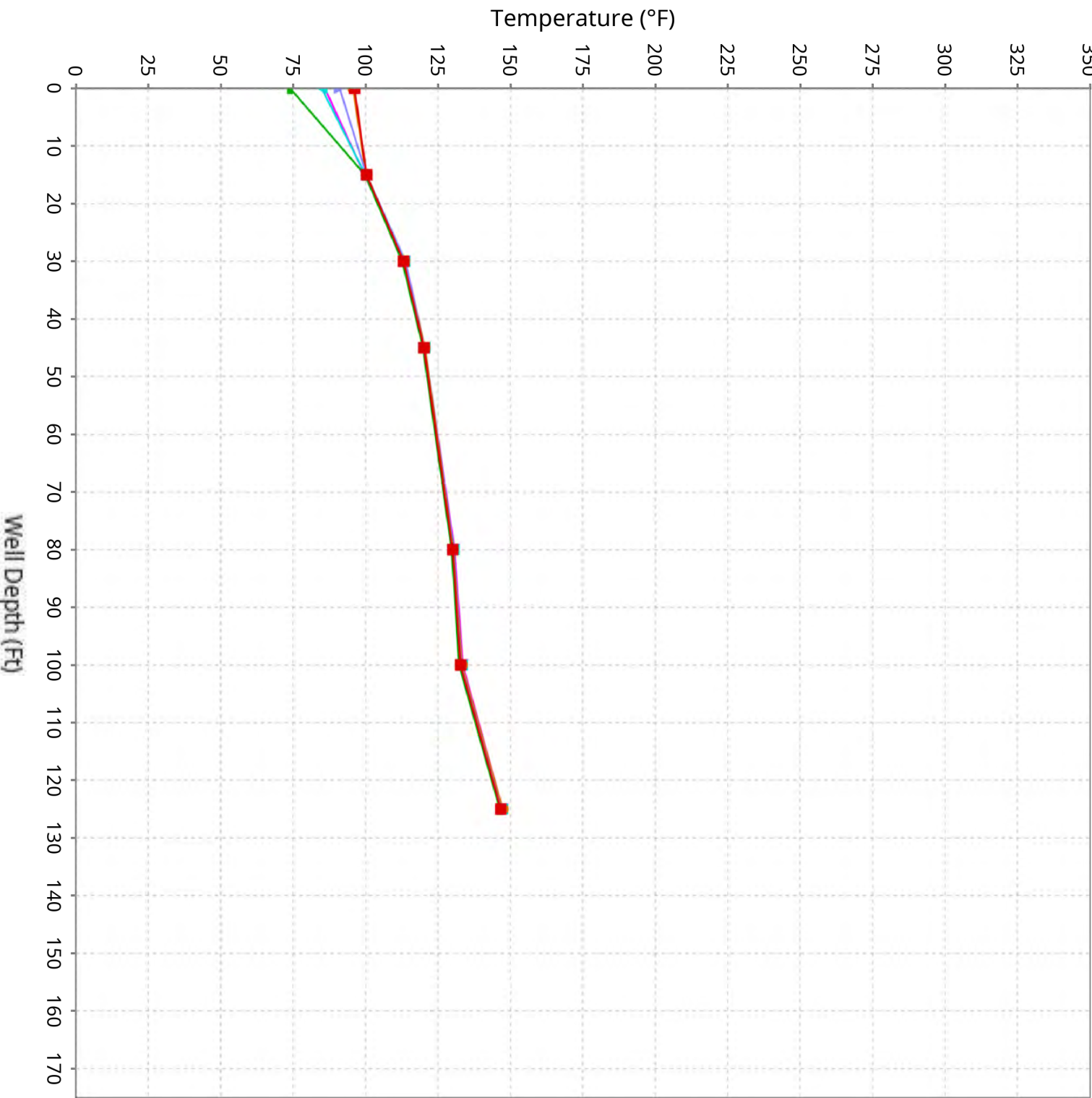
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-11

Maximum data for 3/20/2025 to 4/30/2025



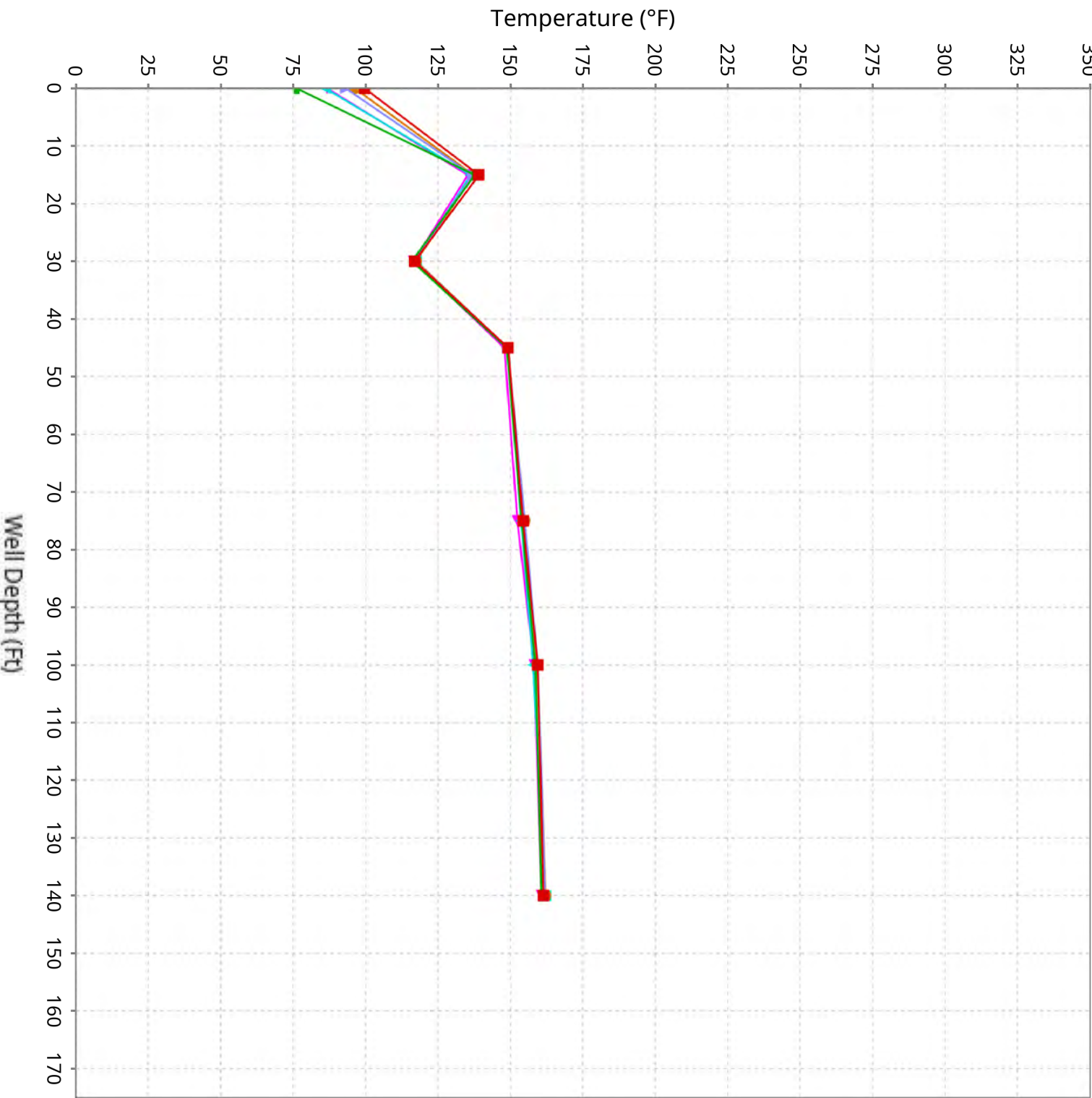
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-12

Maximum data for 3/20/2025 to 4/30/2025



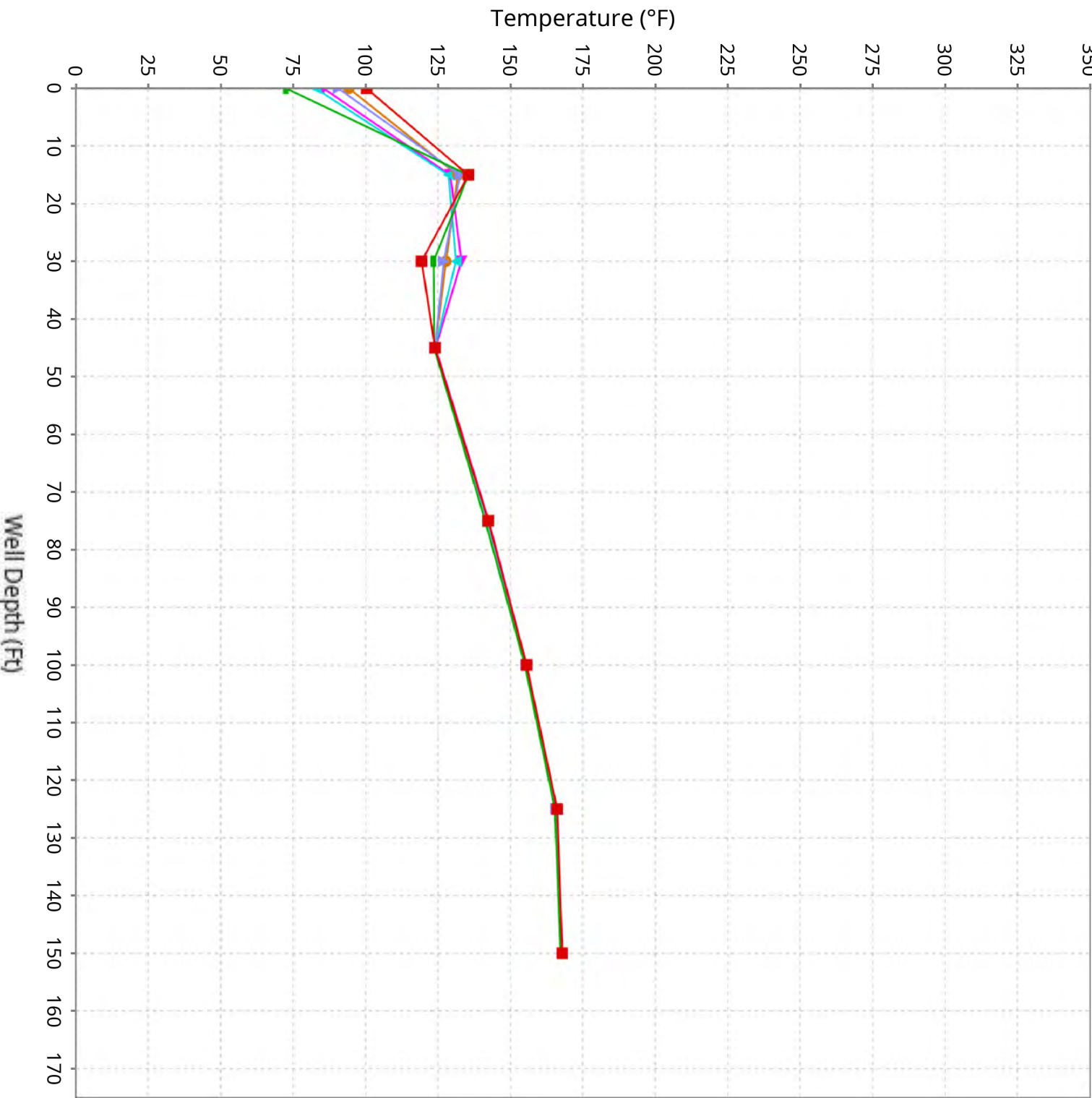
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-13

Maximum data for 3/20/2025 to 4/30/2025



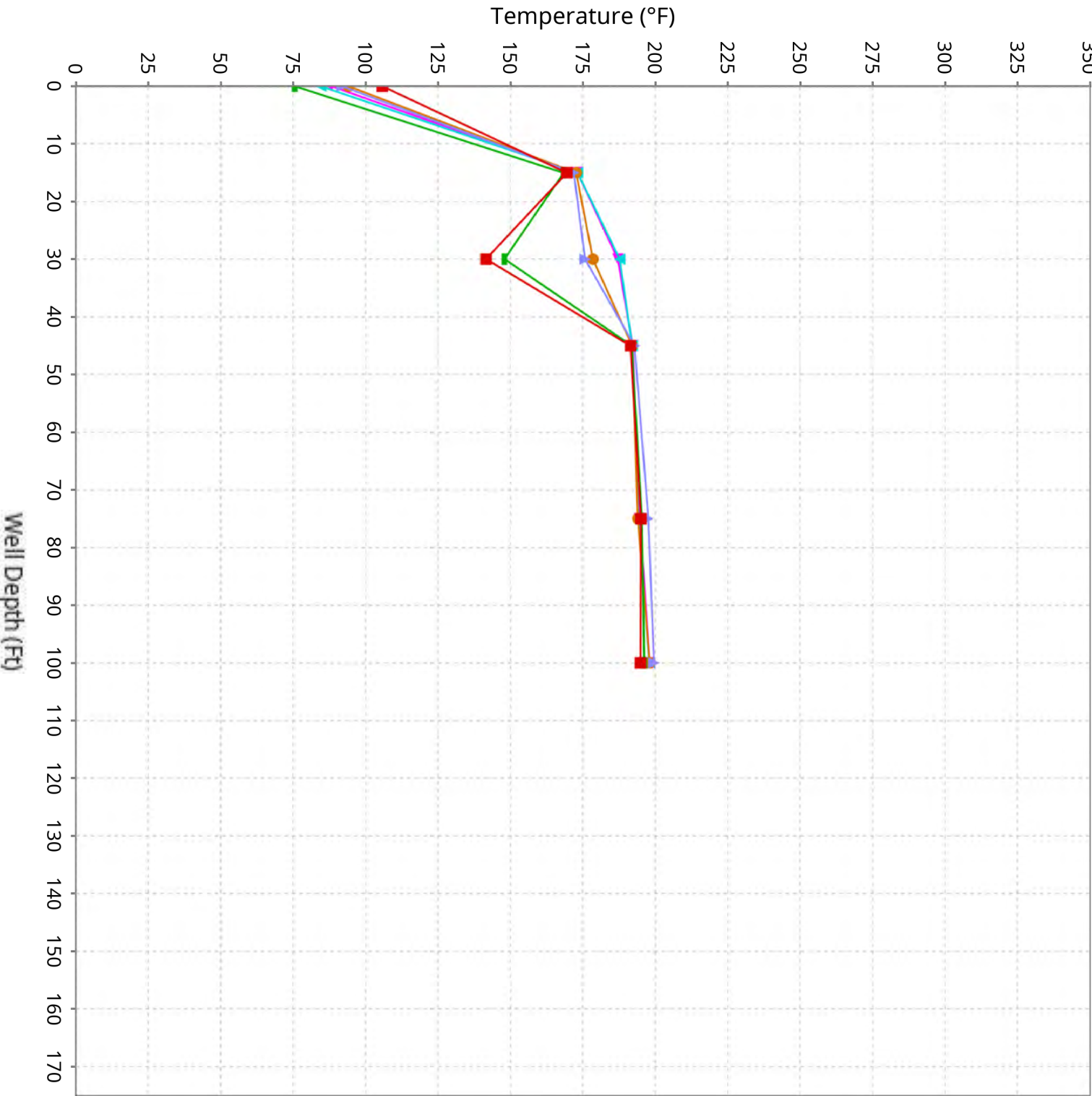
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-14

Maximum data for 3/20/2025 to 4/30/2025



Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-15

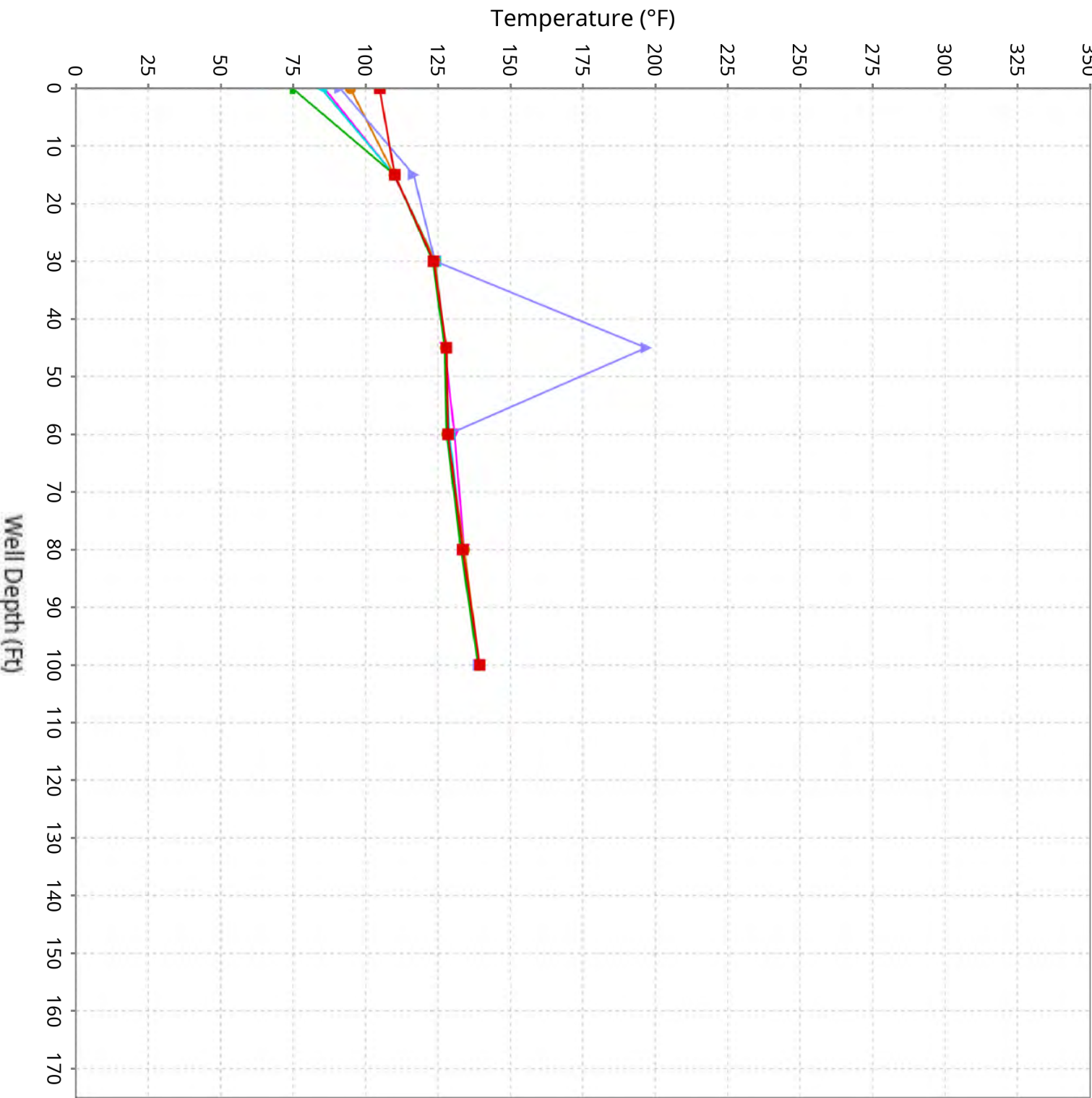
Maximum data for 3/20/2025 to 4/30/2025



3/20/25-3/27/25 3/27/25-4/3/25 4/3/25-4/10/25 4/10/25-4/17/25 4/17/25-4/24/25 4/25/25-4/30/25

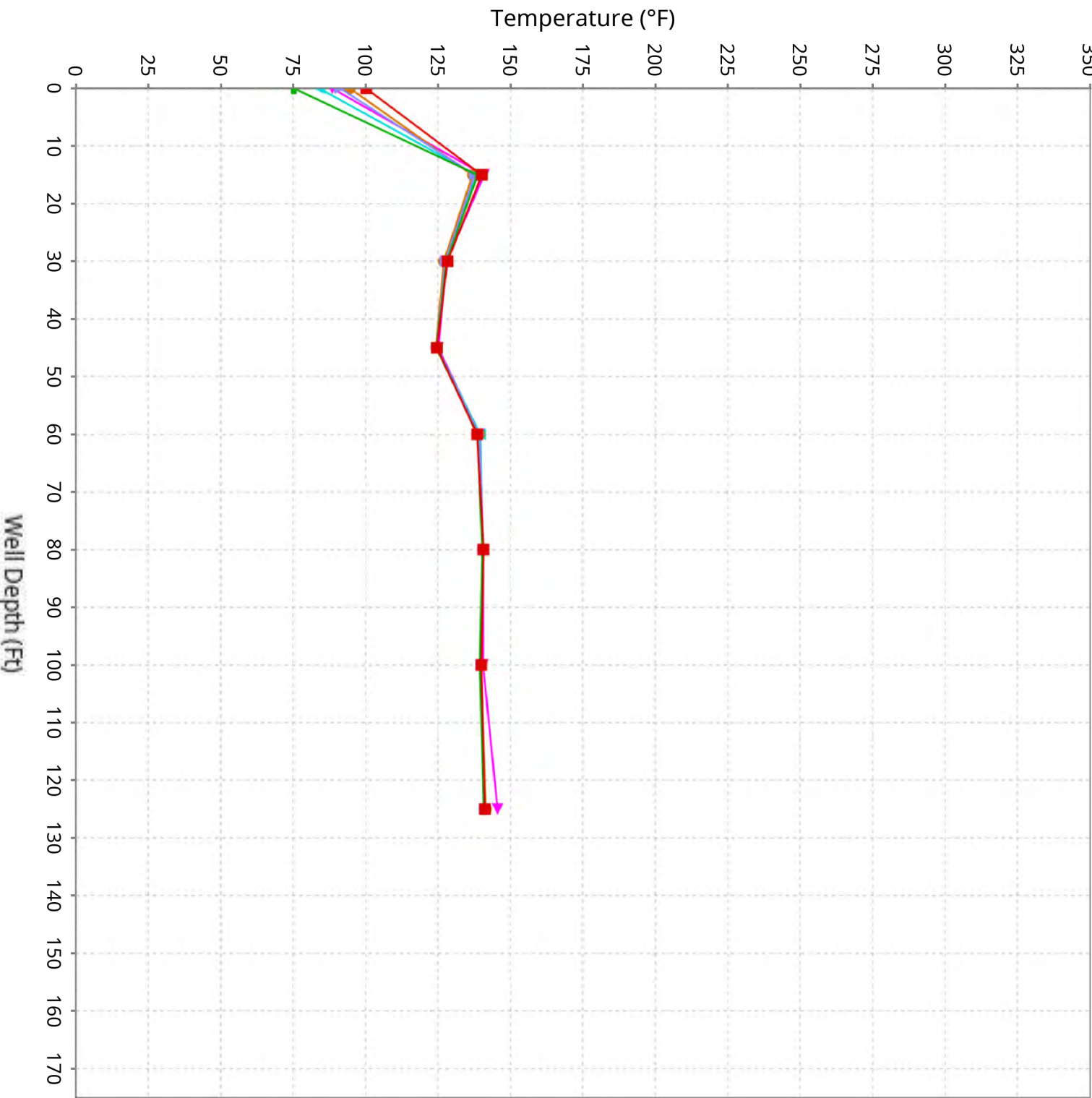
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-16

Maximum data for 3/20/2025 to 4/30/2025



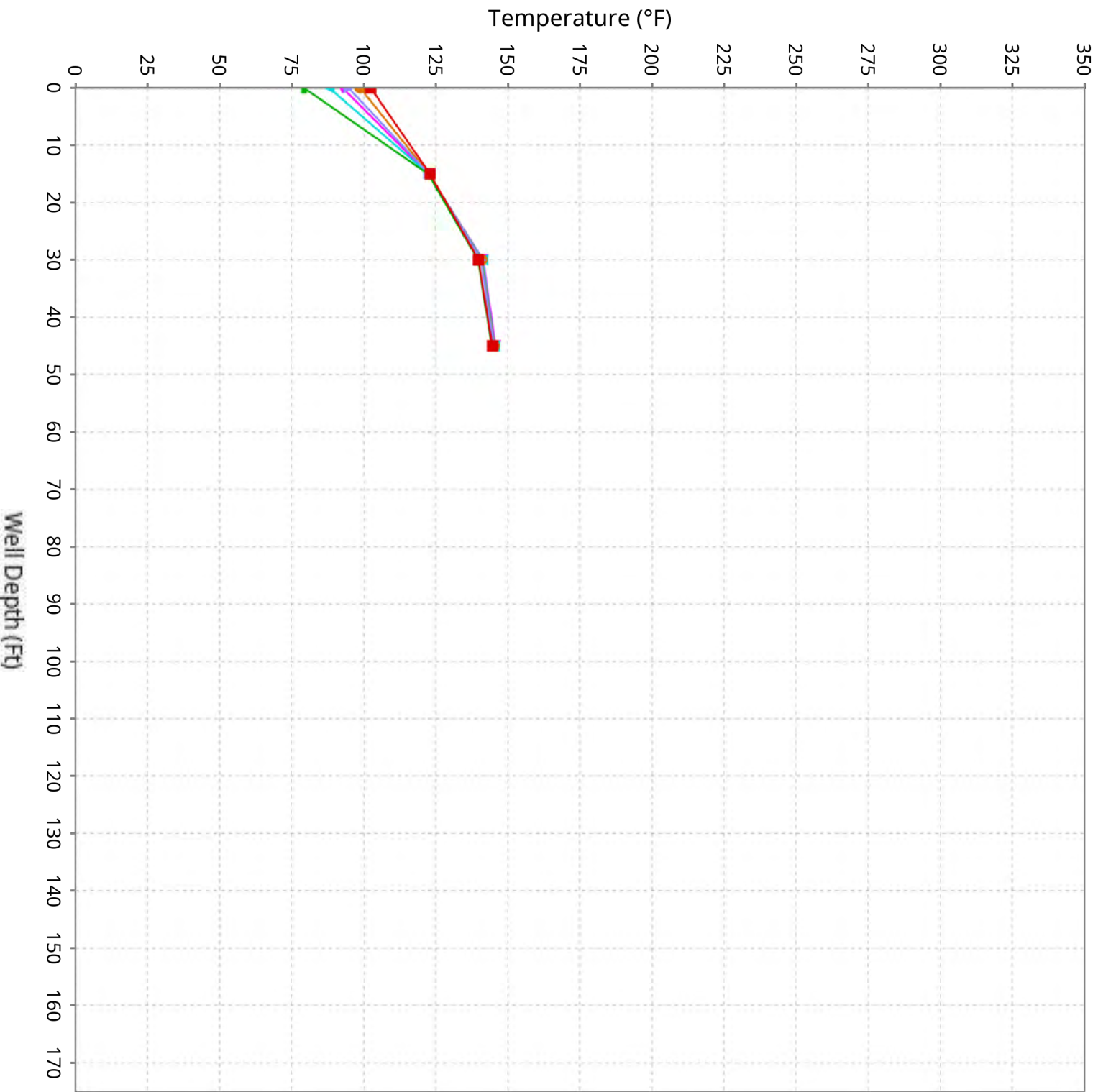
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-17

Maximum data for 3/20/2025 to 4/30/2025



Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-18

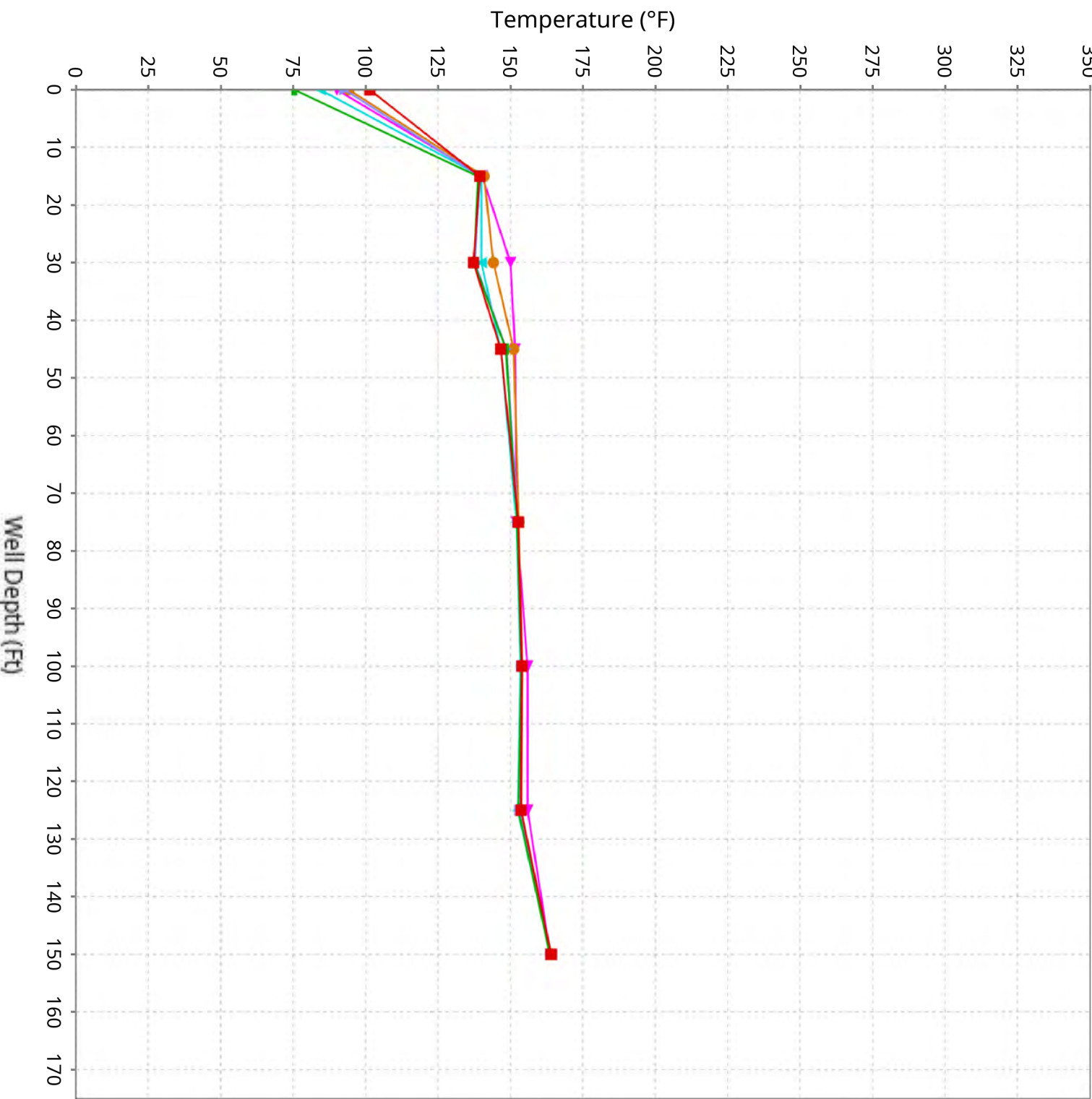
Maximum data for 3/20/2025 to 4/30/2025



3/20/25-3/27/25 3/27/25-4/3/25 4/3/25-4/10/25 4/10/25-4/17/25 4/17/25-4/24/25 4/25/25-4/30/25

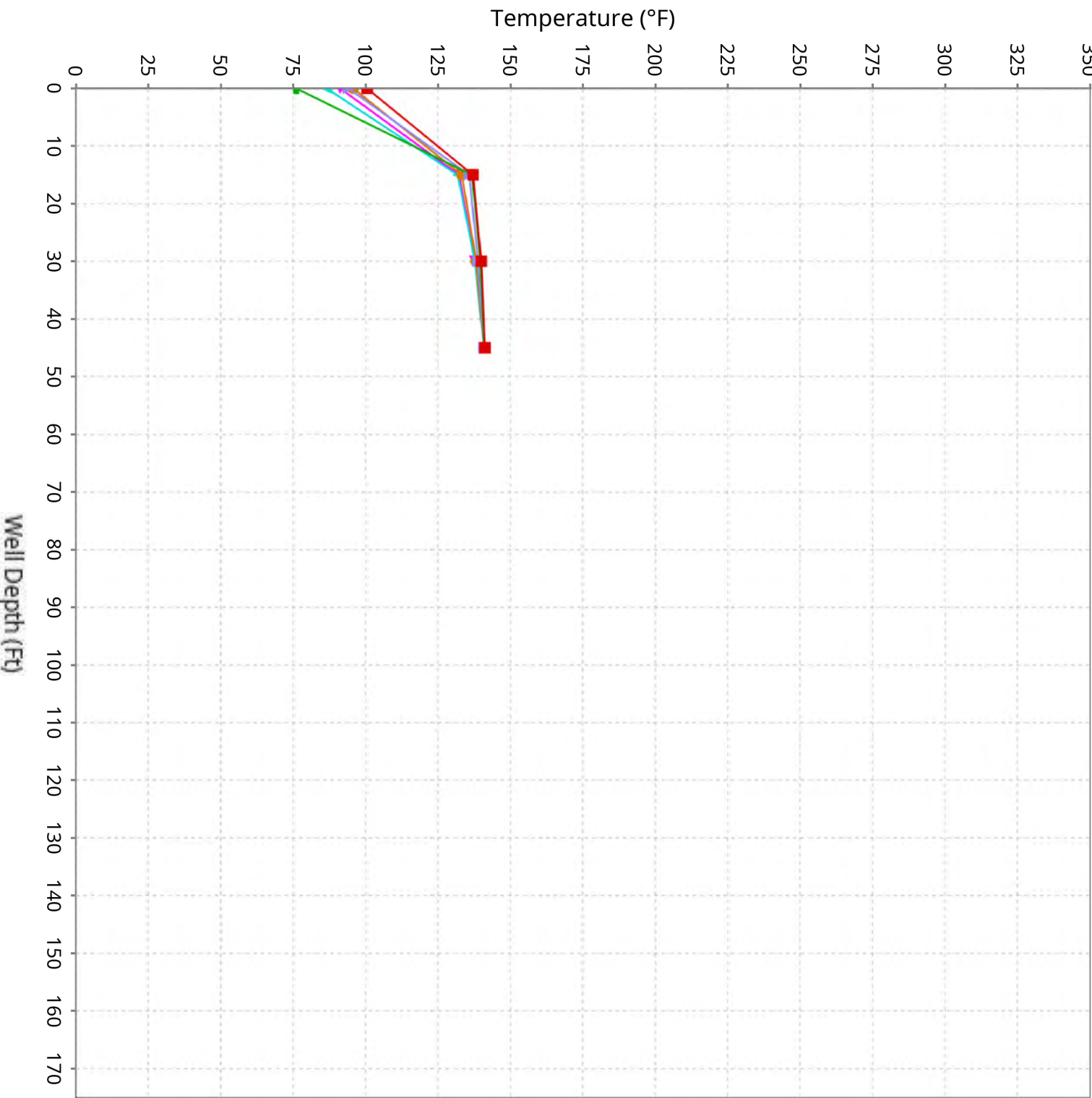
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-19

Maximum data for 3/20/2025 to 4/30/2025



Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-20

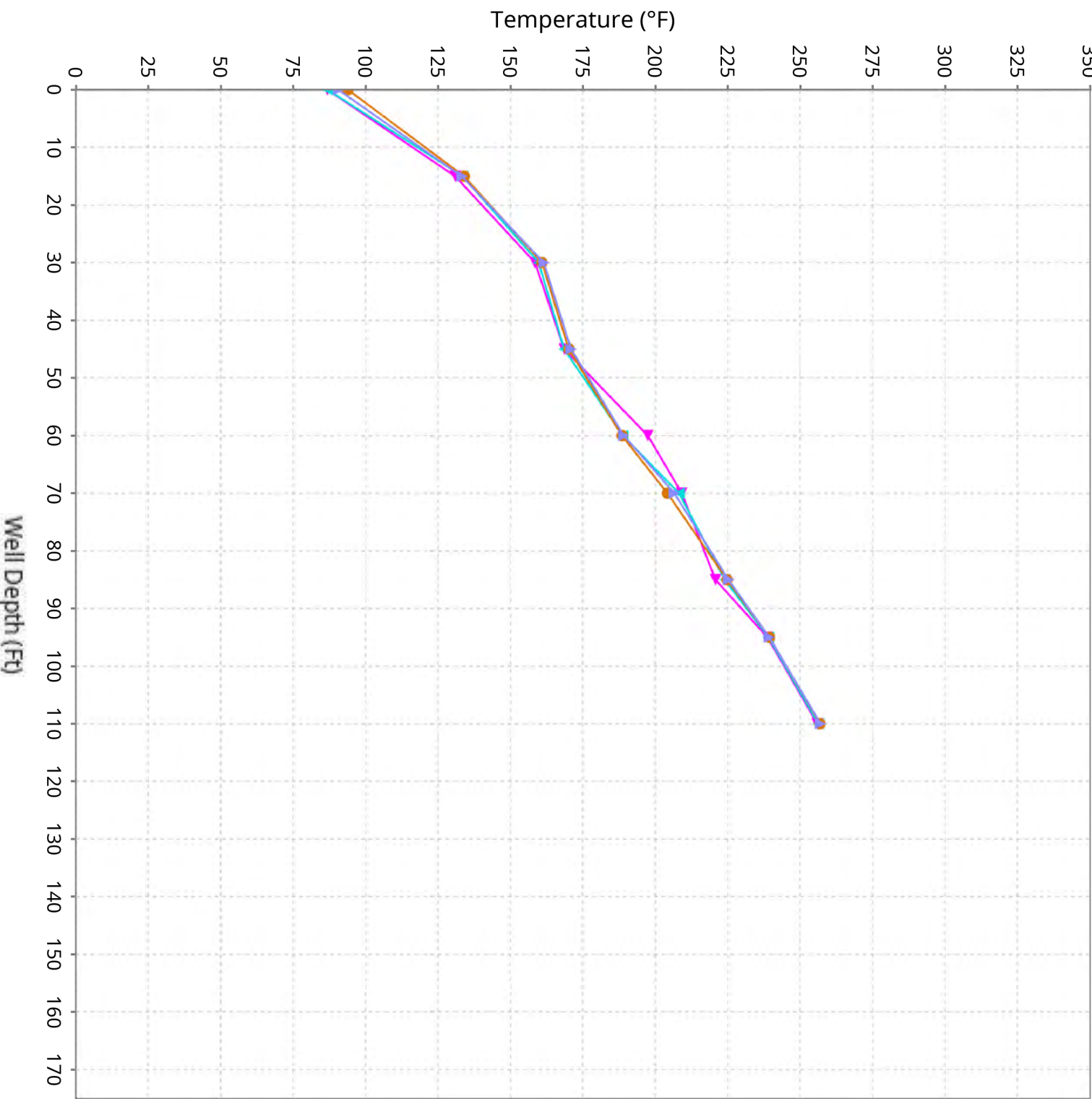
Maximum data for 3/20/2025 to 4/30/2025



3/20/25-3/27/25 3/27/25-4/3/25 4/3/25-4/10/25 4/10/25-4/17/25 4/17/25-4/24/25 4/25/25-4/30/25

Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-21

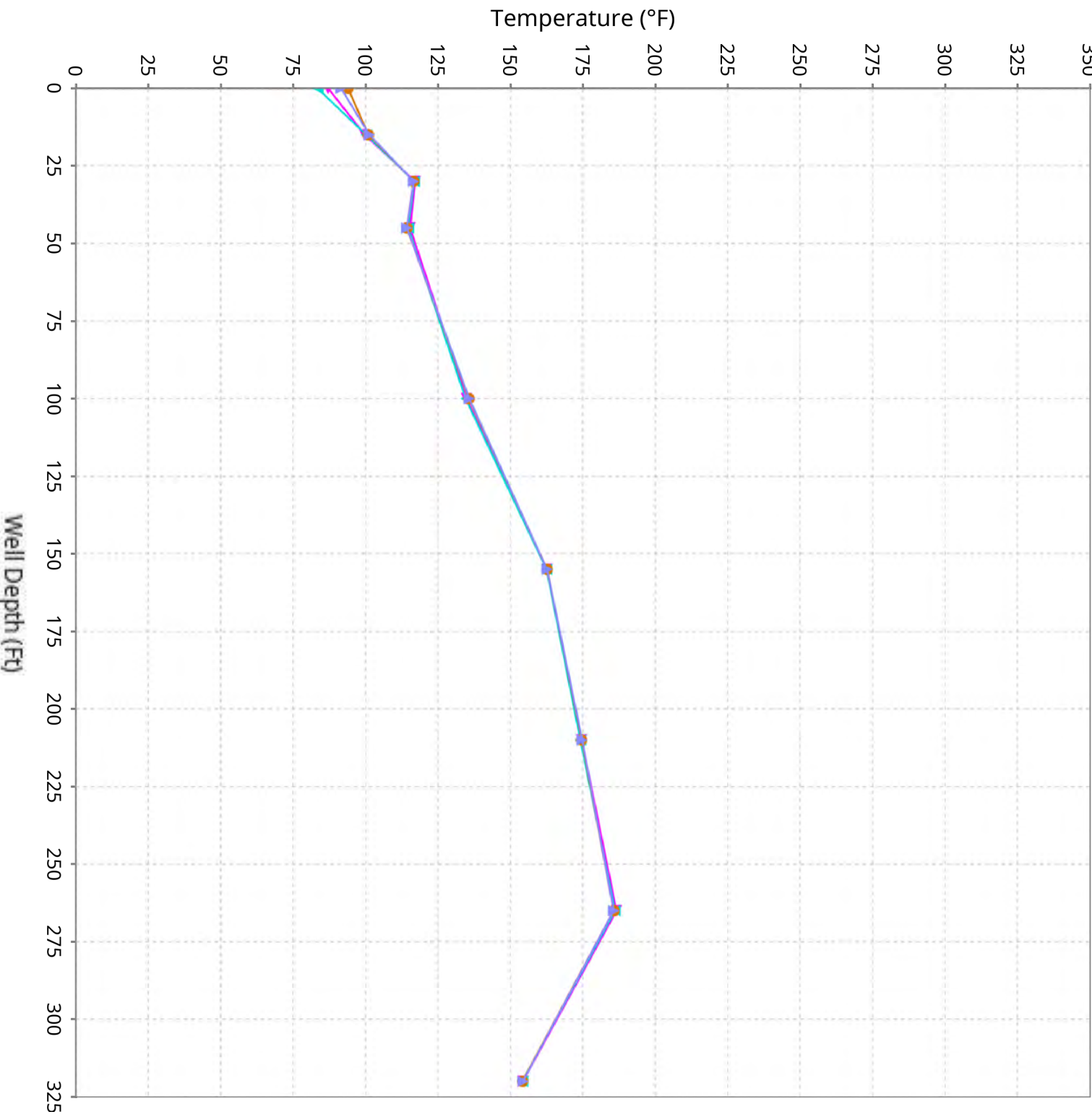
Maximum data for 3/20/2025 to 4/30/2025



3/20/25-3/27/25 3/27/25-4/3/25 4/3/25-4/10/25 4/10/25-4/17/25 4/17/25-4/24/25 4/25/25-4/30/25

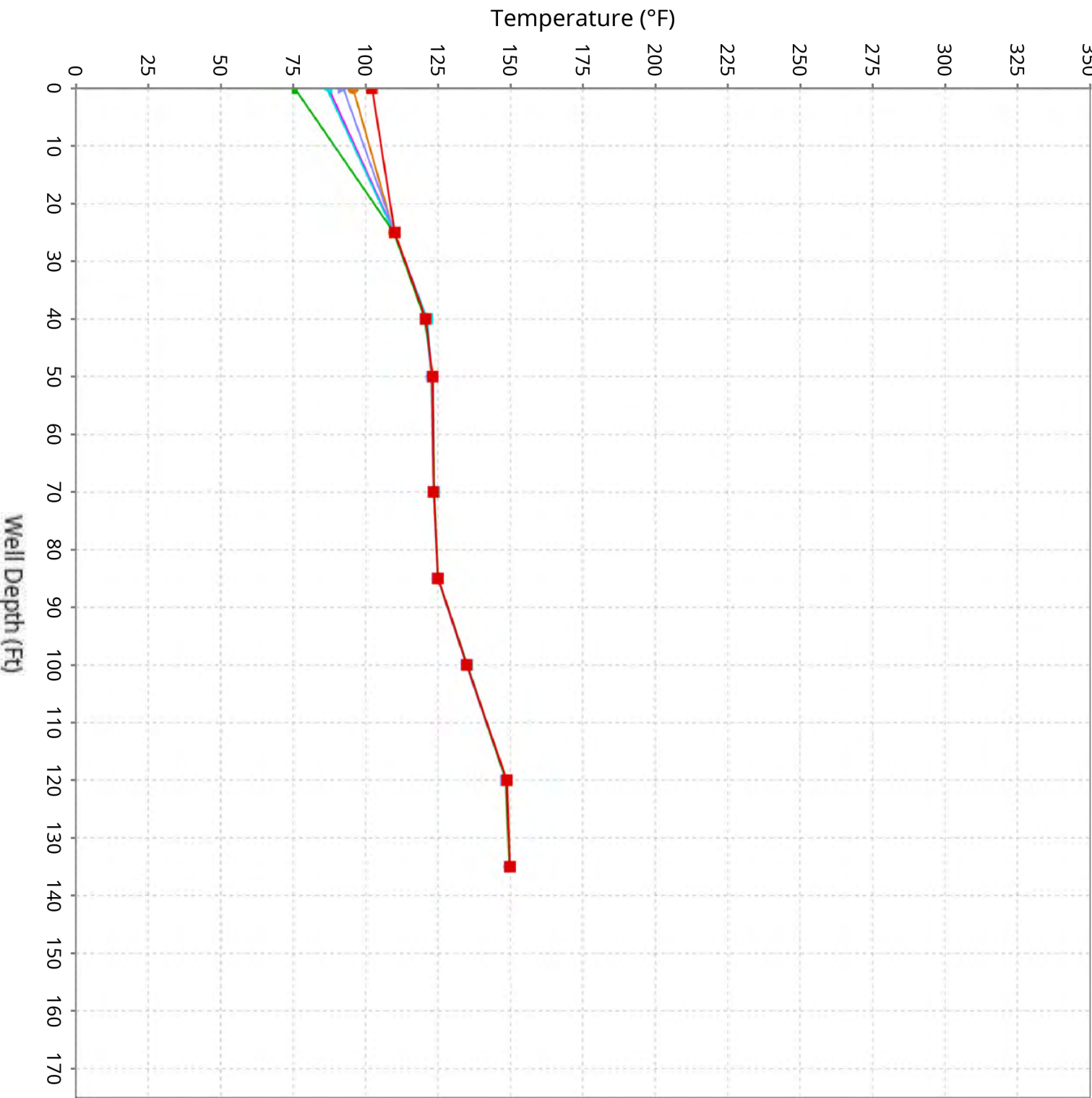
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-24

Maximum data for 3/20/2025 to 4/30/2025



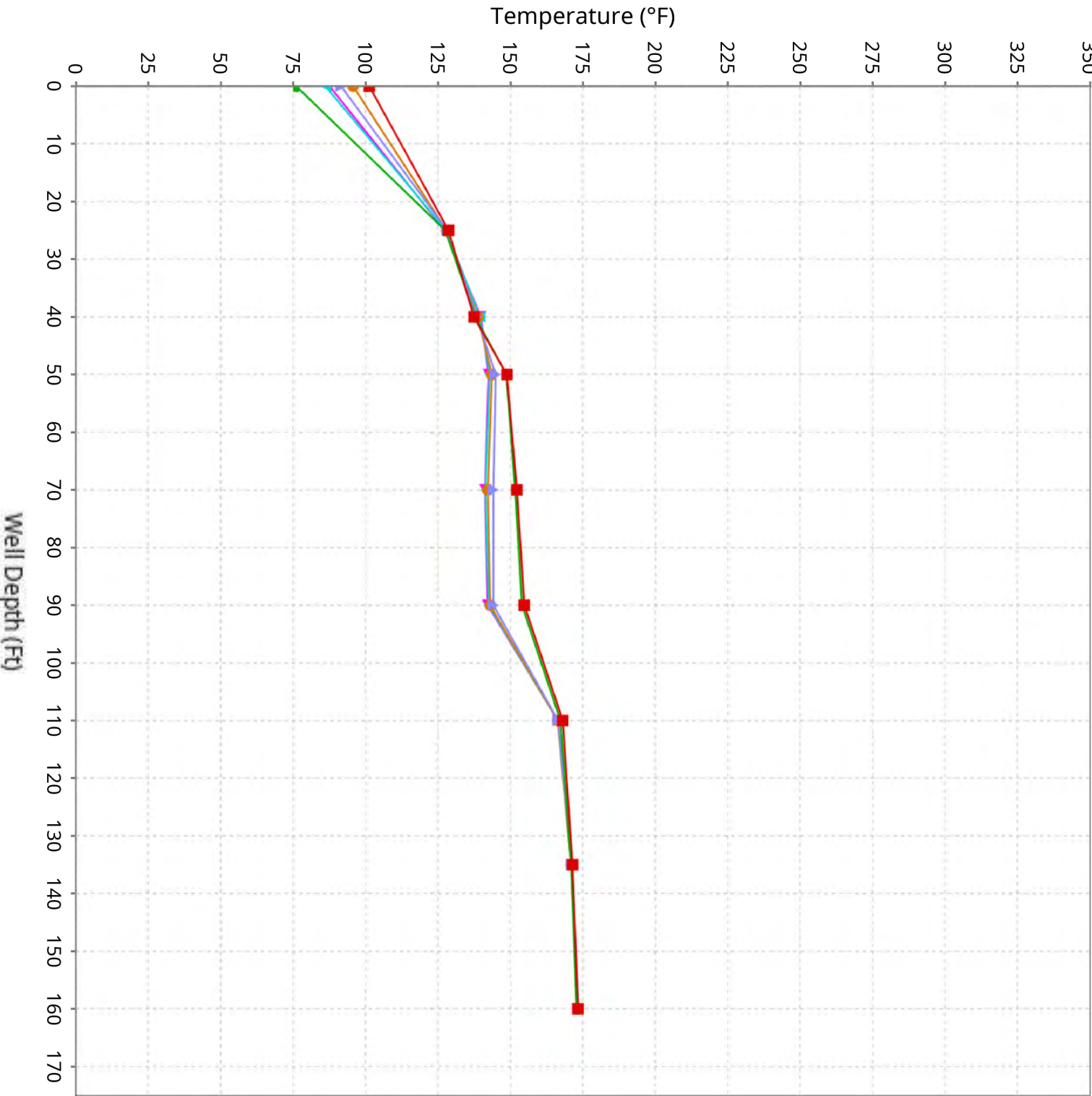
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-25

Maximum data for 3/20/2025 to 4/30/2025



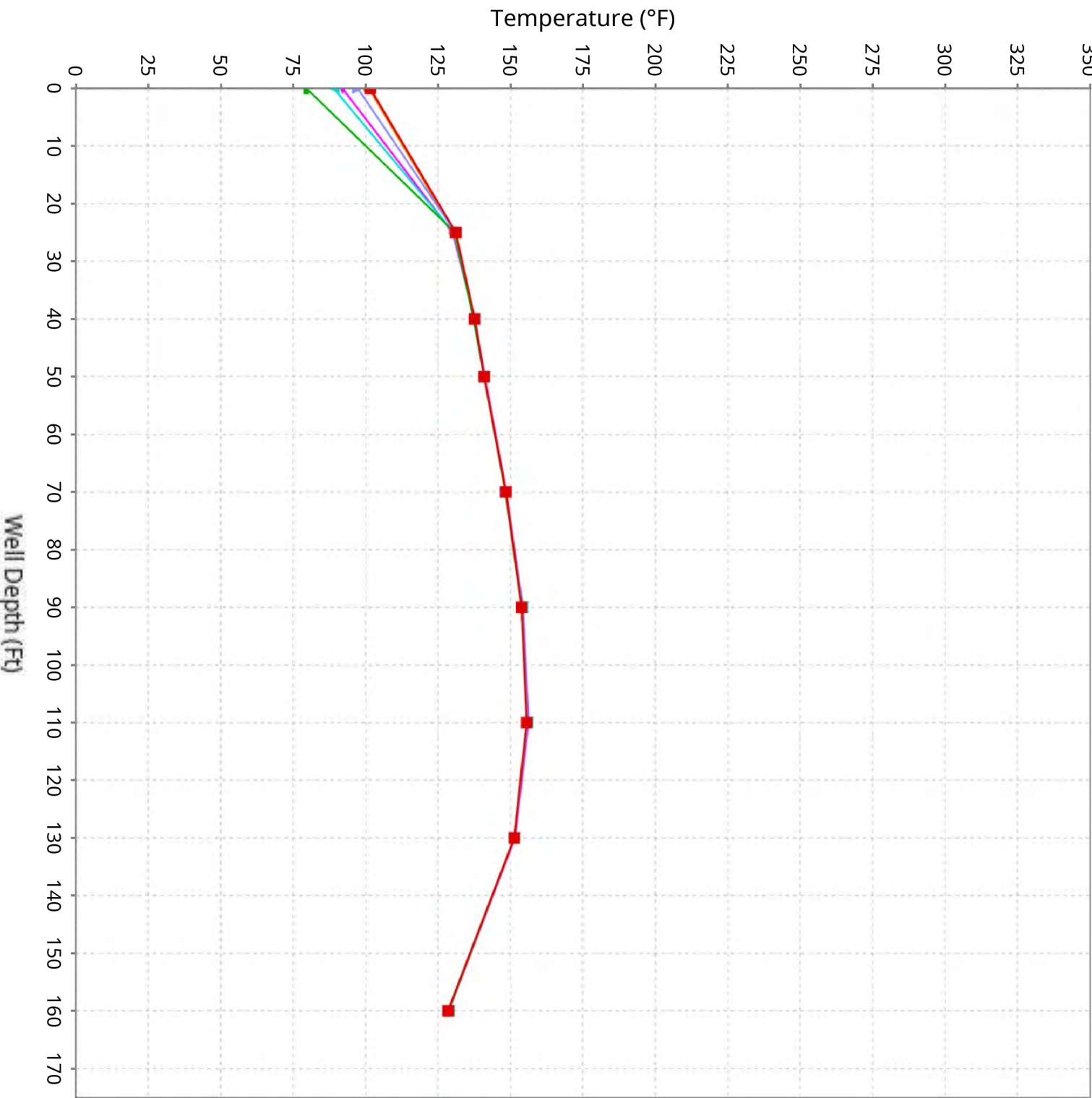
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-26

Maximum data for 3/20/2025 to 4/30/2025



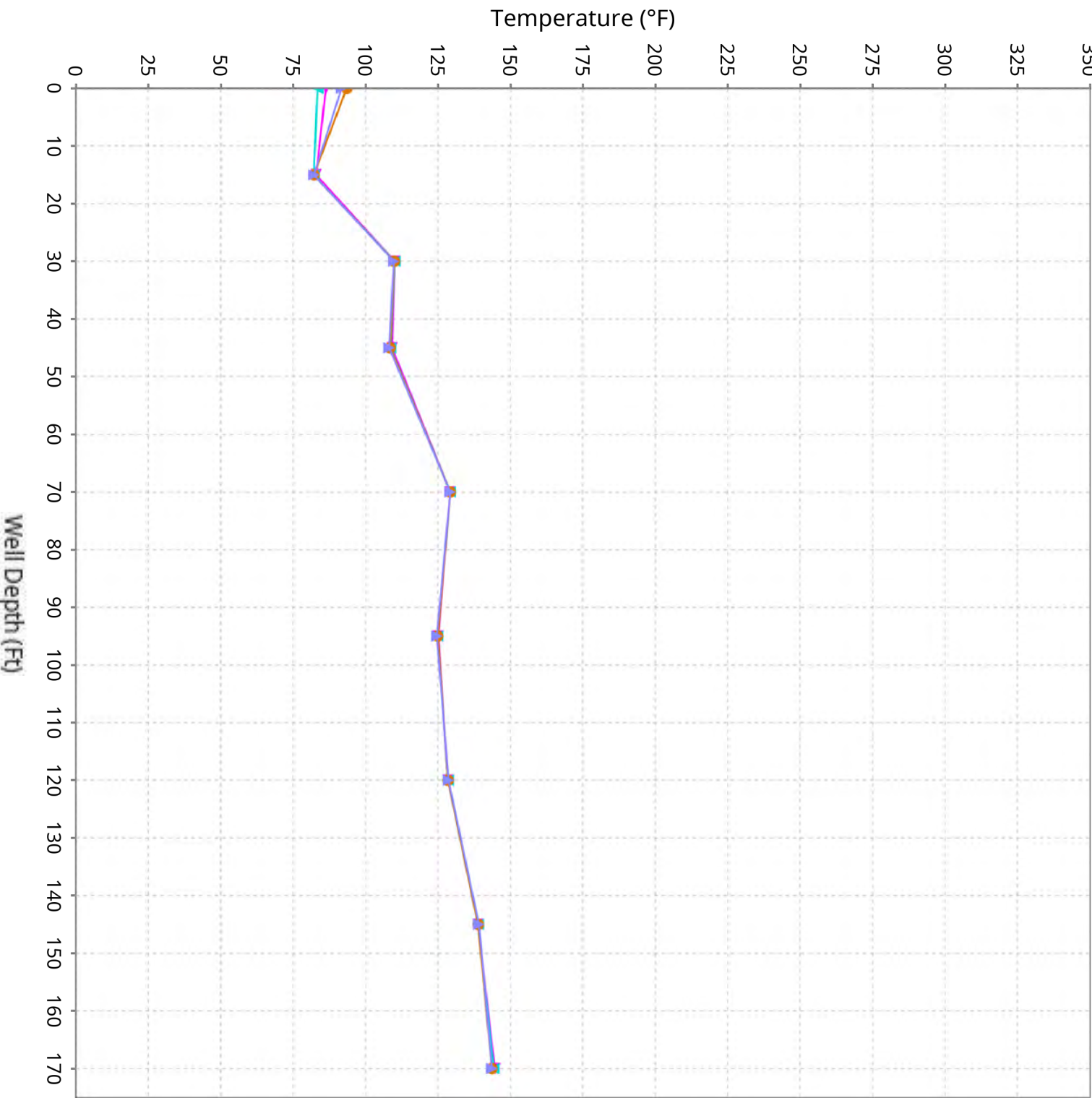
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-27

Maximum data for 3/20/2025 to 4/30/2025



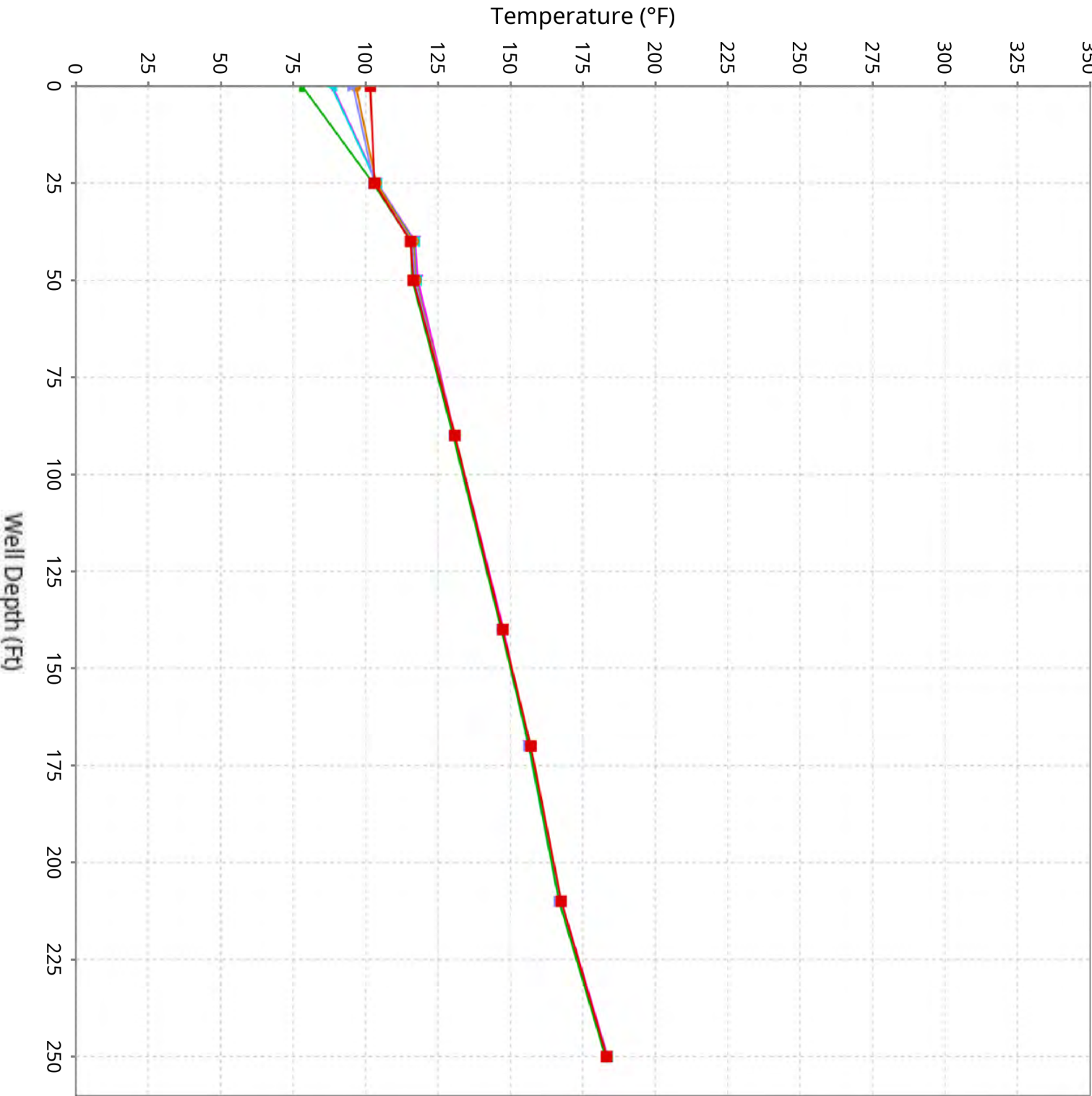
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-28

Maximum data for 3/20/2025 to 4/30/2025



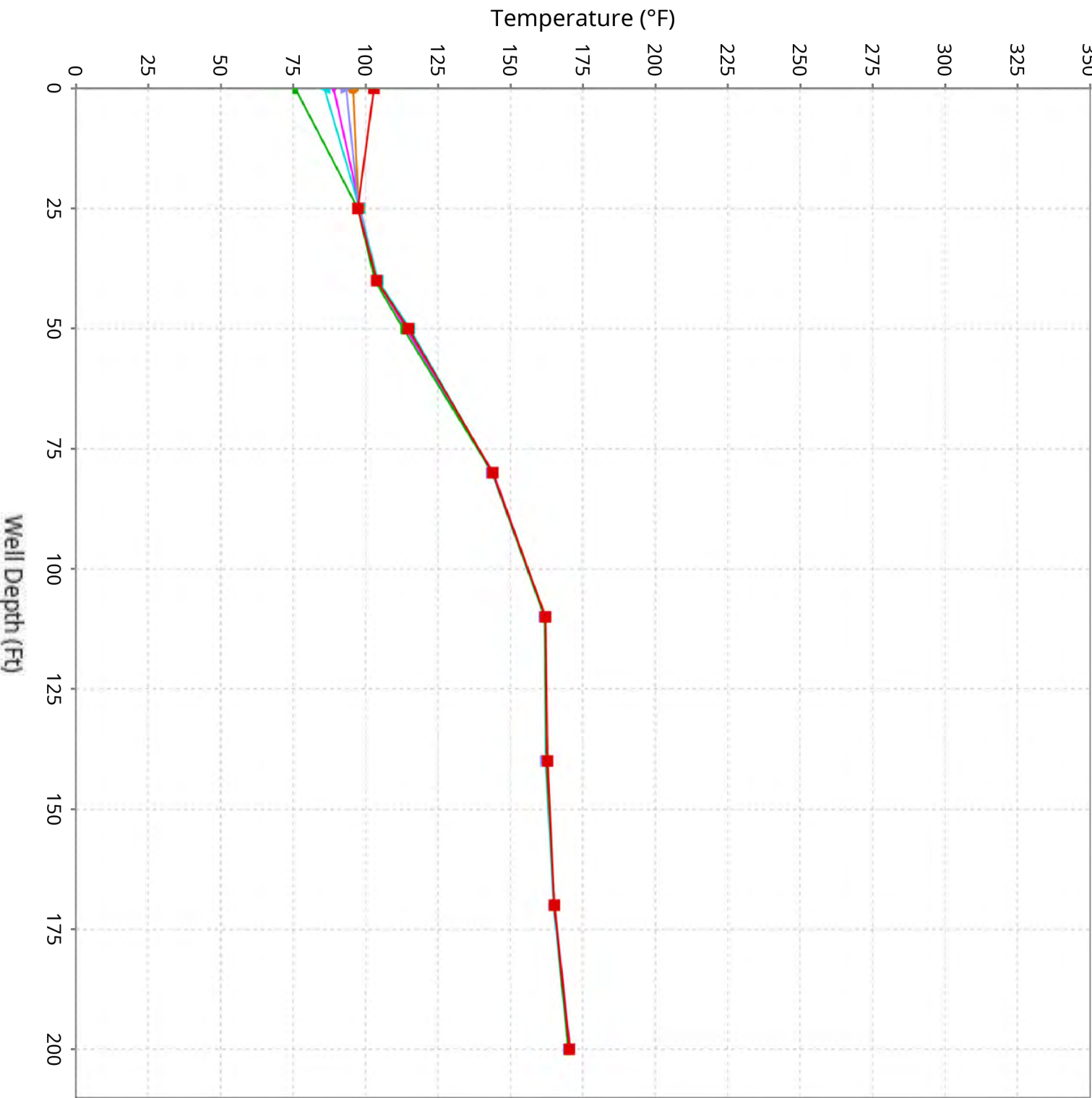
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-29

Maximum data for 3/20/2025 to 4/30/2025



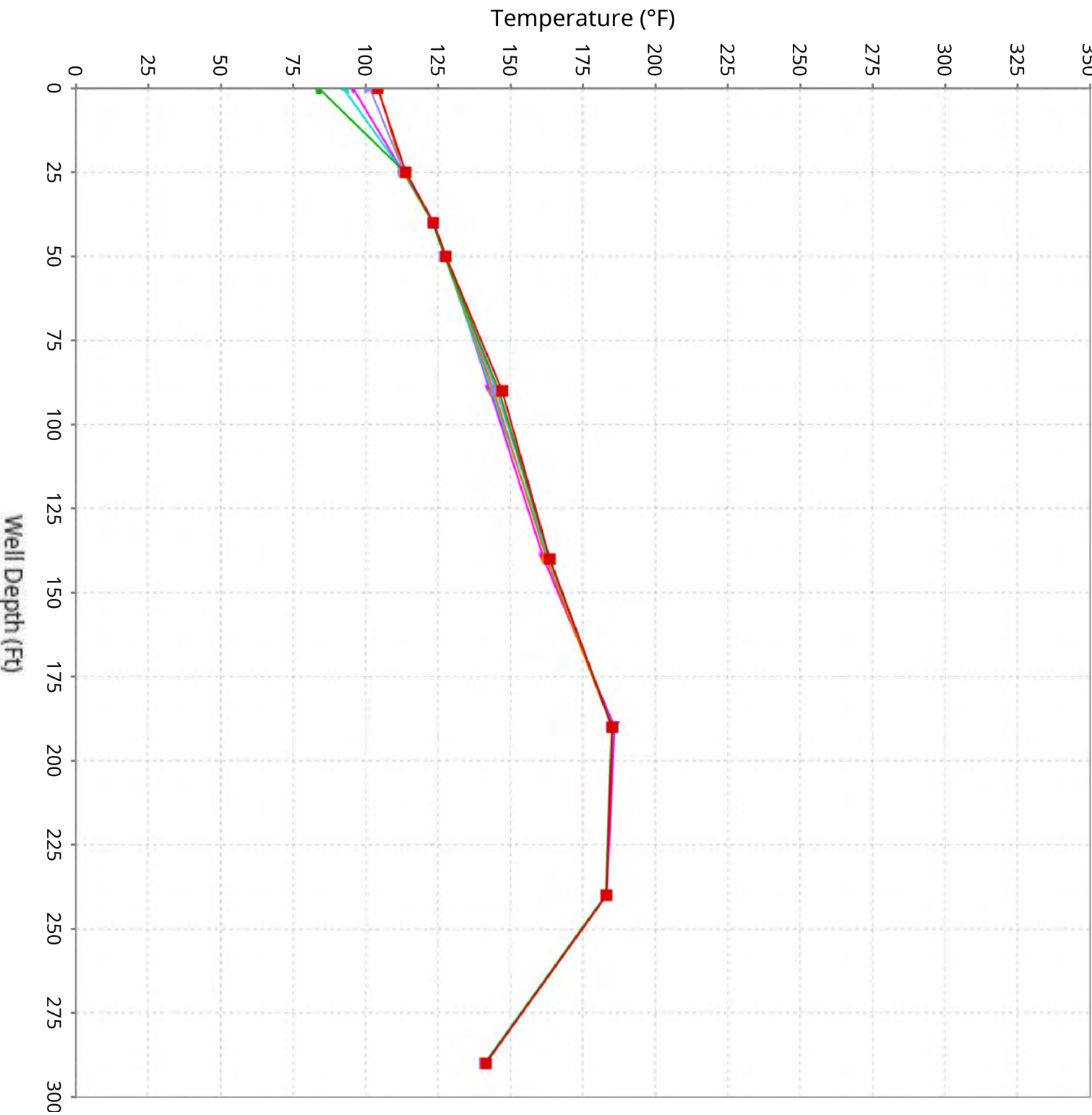
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-30

Maximum data for 3/20/2025 to 4/30/2025



Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-31

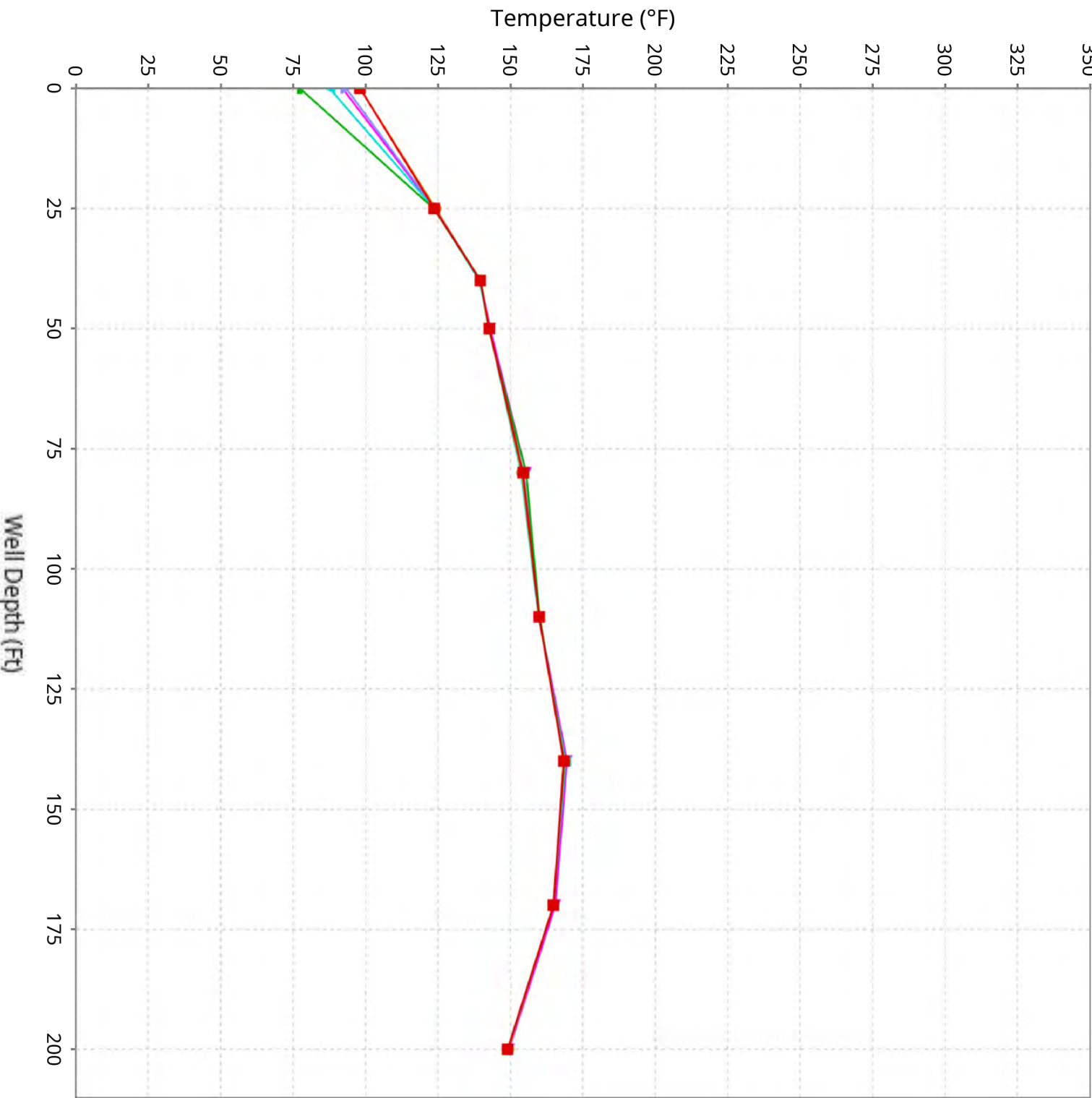
Maximum data for 3/20/2025 to 4/30/2025



3/20/25-3/27/25 3/27/25-4/3/25 4/3/25-4/10/25 4/10/25-4/17/25 4/17/25-4/24/25 4/25/25-4/30/25

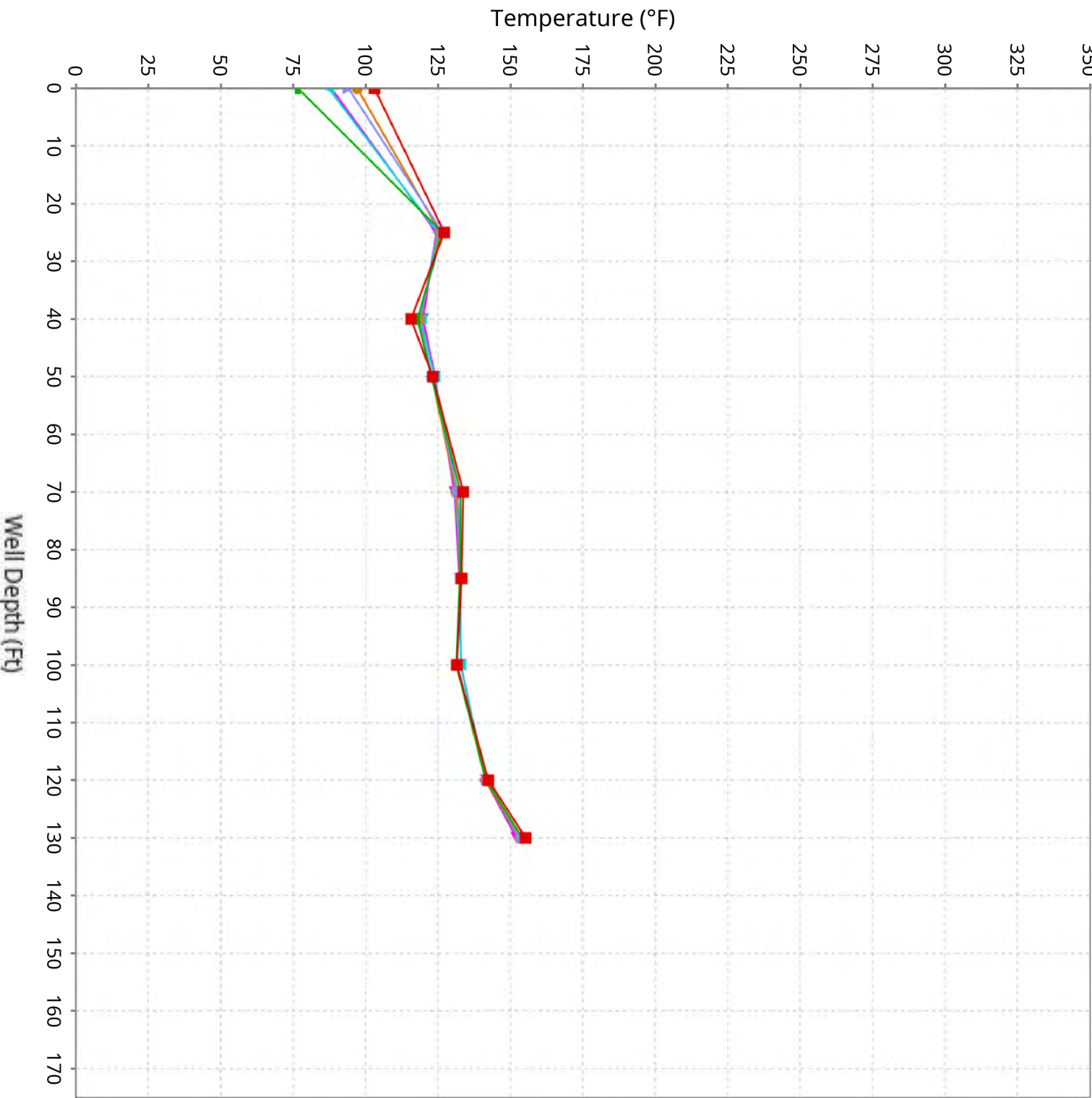
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-32

Maximum data for 3/20/2025 to 4/30/2025



Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-34

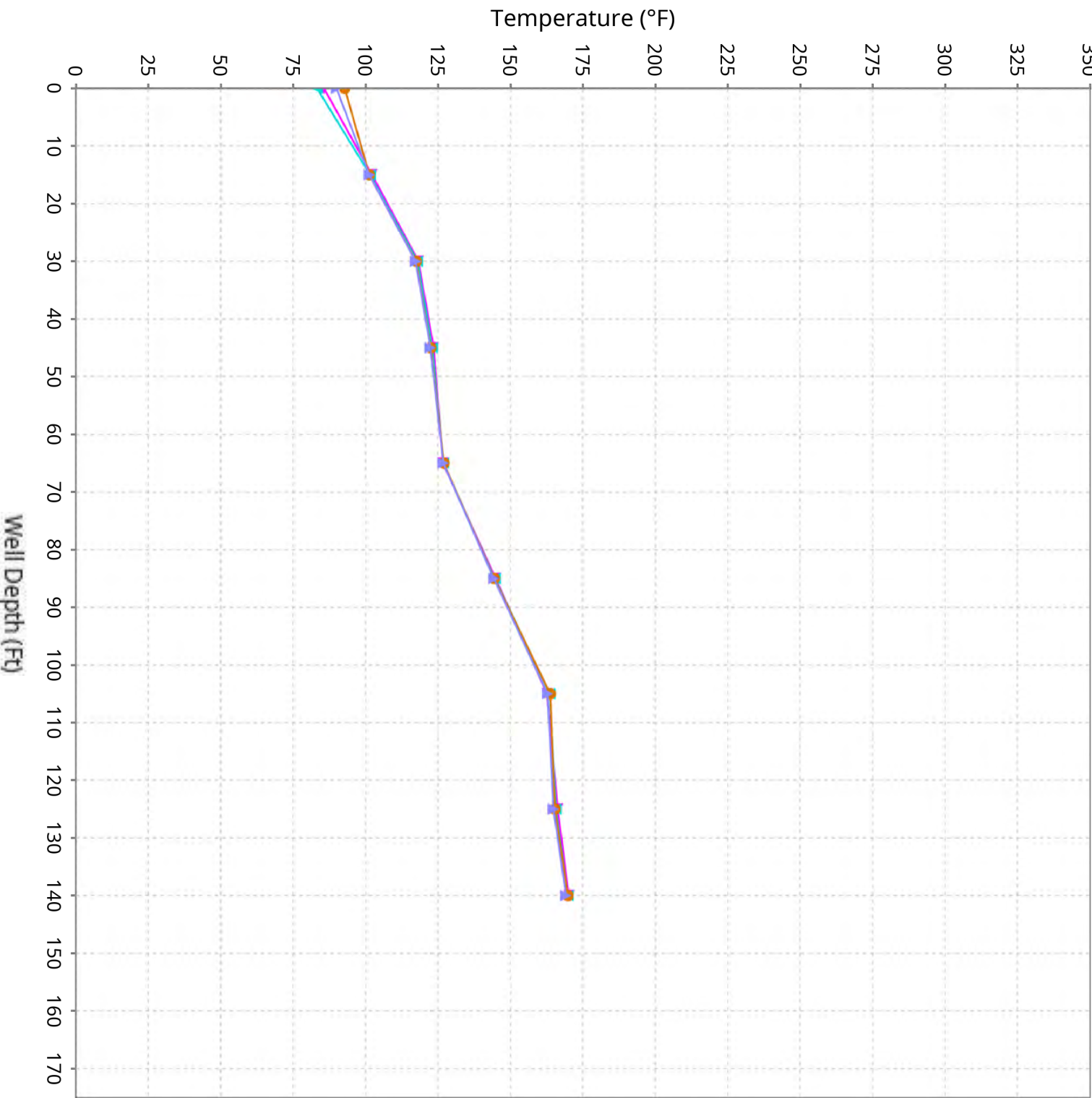
Maximum data for 3/20/2025 to 4/30/2025



3/20/25-3/27/25 3/27/25-4/3/25 4/3/25-4/10/25 4/10/25-4/17/25 4/17/25-4/24/25 4/25/25-4/30/25

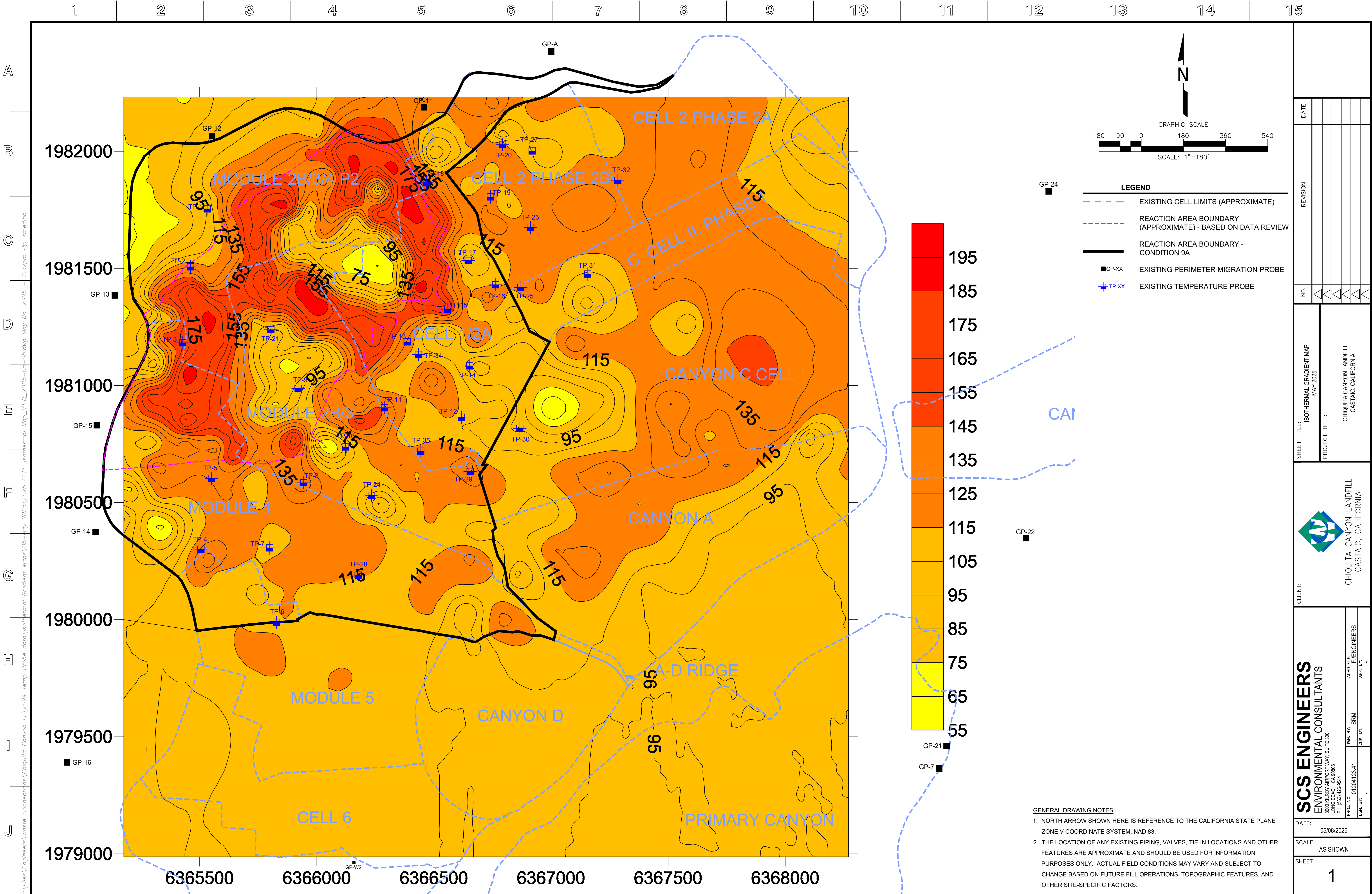
Vertical Temperature Profiles from Temperature Probes at Chiquita Landfill for TP-35

Maximum data for 3/20/2025 to 4/30/2025



Maximum Vertical Temperature Map from Temperature Probes at Chiquita Landfill







Ranges Mapped

	# Points
■ ≥ 0 and < 100	24
■ ≥ 100 and < 500	6
■ ≥ 500 and < 1000	7
■ ≥ 1000 and < 1000000	63

Point Type Legend

 well

Chiquita Canyon Landfill

Range Map

Parameter: CO (mid range)

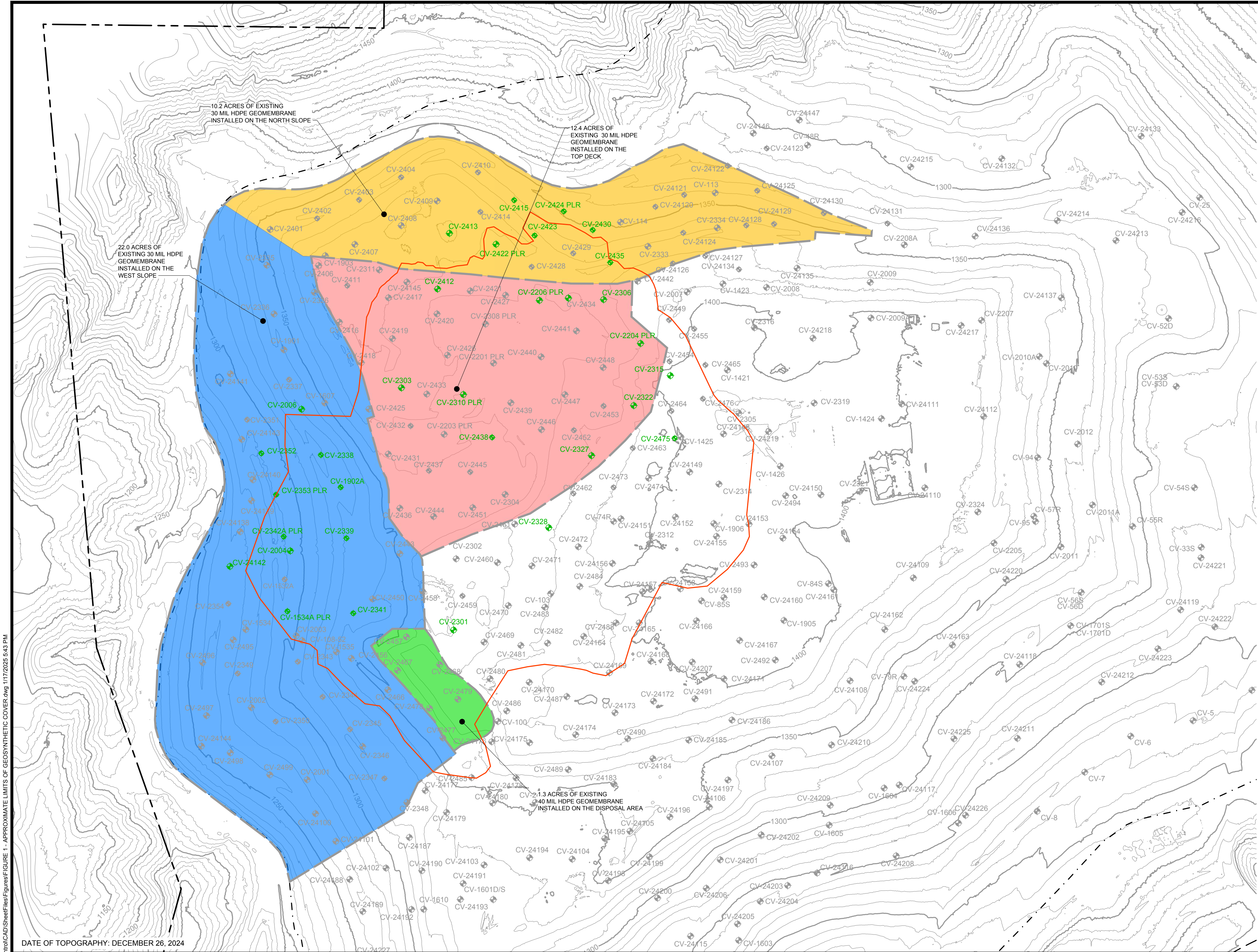
Analysis Method: Average

Date Range: 04/01/2025 - 04/30/2025

Map generation date : 05/06/2025



APPENDIX B
EXTENT OF EXISTING GEOMEMBRANE COVER



- NOTES:
- EXISTING LINER LIMITS PER JANUARY 10, 2025 AERIAL PHOTO.
 - LIMIT OF SETTLEMENT AS OF JANUARY 3, 2025.
 - WELLS SHOWING SIGNS OF A REACTION AS OF JANUARY 10, 2025 DATA PER SCS ENGINEERS. A REACTIVE WELL IS A VERTICAL WELL THAT EXHIBITS ALL OF THE FOLLOWING CHARACTERISTICS:
 - LANDFILL GAS (LFG) WELLHEAD TEMPERATURES IN EXCESS OF APPROXIMATELY 160 DEGREES FAHRENHEIT.
 - POOR GAS QUALITY (DEFINED AS METHANE LEVELS OF LESS THAN 30 PERCENT) IN CONJUNCTION WITH METHANE-TO-CARBON DIOXIDE (CH4:CO2) RATIOS LESS THAN 1.0.
 - THE CONCENTRATION OF HYDROGEN (H2) IN THE LFG MEASURED GREATER THAN 2 PERCENT BY VOLUME.

- LEGEND**
- PROPERTY BOUNDARY
 - PERMITTED LIMIT OF REFUSE
 - EXISTING LIMIT OF LINER
 - LIMIT OF SETTLEMENT
 - 2024 MAJOR CONTOUR
 - 2024 MINOR CONTOUR
 - EXISTING VERTICAL WELL
 - EXISTING VERTICAL WELL - PRESSURIZED LEACHATE RELEASE
 - EXISTING VERTICAL WELL - REACTIVE
 - EXISTING HORIZONTAL WELL

P:\Waste Connectors\Chiquita\Ode Central\CAD\Sheets\Figures\FIGURE 1 - APPROXIMATE LIMITS OF GEOSYNTHETIC COVER.dwg 1/17/2025 5:43 PM



TETRA TECH
21700 Copley Drive, Suite 200
Diamond Bar, CA 91765
TEL 909.860.7777 FAX 909.860.8017



APPENDIX C
VIAFLEX ABSOLUTE BARRIER X60BCS PRODUCT BROCHURE

ABSOLUTE BARRIER® X60BCS

2-SIDE TEXTURED HDPE/EVOH GEOMEMBRANE GAS BARRIER

Viaflex

PRODUCT DESCRIPTION

Absolute Barrier® X60BCS is a seven-layer co-extruded double-side textured geomembrane consisting of durable high-density polyethylene (HDPE) and an inner core of highly effective barrier resin, designed specifically as a barrier against methane, radon, landfill odors, and VOCs. High strength HDPE provides excellent chemical resistance and outdoor durability. A robust stabilization package that exceeds the industry standard; provides long-term protection from thermal oxidation and ultraviolet degradation in exposed applications. The aggressive surface texture provides excellent stabilization for earthen and secondary geosynthetics as well as work site safety.

PRODUCT USE

Absolute Barrier® X60BCS is formulated to effectively stop gas vapor and odor migration in long-term outdoor cover, containment, and capping applications. XT-Series has been specifically designed to perform in the municipal solid waste industry as landfill covers, caps and impoundment containment covers.

Absolute Barrier® X60BCS is an effective temporary and long term landfill cap and is less permeable to VOCs than standard 80 mil HDPE geomembranes. Contaminants found in leachate and landfill gas in municipal and hazardous waste landfills can migrate through standard HDPE contributing to both atmospheric and groundwater contaminations.

Absolute Barrier® XT-Series provides an effective barrier to a wide range of VOCs including benzene, toluene, trichloroethylene, perchloroethylene, and many others.

SIZE & PACKAGING

Absolute Barrier® X60BCS is available in 16' wide layflat in various roll lengths. All panels are tightly rolled onto a heavy-duty core for ease of handling and time saving installation. Absolute Barrier® geomembranes are black or can be manufactured in other custom colors with minimum quantity order requirements.



Landfill Odor Control Barrier

PRODUCT

PART

ABSOLUTE BARRIER® X60BCS

APPLICATIONS

Odor Control Barrier	Underslab Radon Barrier
EPS Geofoam Protection	Underslab Methane Barrier
Buried Landfill Cap	Underslab Vapor Barrier
Temporary Landfill Gas Cover	Remediation Cover / Liner
Floating Gas Cover	Leachate Collection Ponds
Underslab VOC Barrier	Interim Landfill Covers

Absolute V Barrier®
THE ULTIMATE IN GAS CONTAINMENT

ABSOLUTE BARRIER® X60BCS

2-SIDE TEXTURED HDPE/EVOH GEOMEMBRANE GAS BARRIER

PRO-FORMA DATA SHEET - TYPICAL VALUES

		ABSOLUTE BARRIER® X60BCS			
		IMPERIAL		METRIC	
PROPERTIES	TEST METHOD	MINIMUM	TYPICAL	MINIMUM	TYPICAL
APPEARANCE		Black 2-Side Texture		Black 2-Side Texture	
THICKNESS	ASTM D5994	57 Mil Average	60 Mil Nominal	1.45 mm Average	1.52 mm Nominal
ASPERITY HEIGHT	ASTM D7466	16 Mil	18 Mil	0.41 mm	0.46 mm
WEIGHT, NOMINAL		317 lbs/msf		1548 g/m ²	
DENSITY	ASTM D792	0.94 g/cm ³	0.95 g/cm ³	0.94 g/cm ³	0.95 g/cm ³
TENSILE STRENGTH AT YIELD	ASTM D6693	126 lbs/in	160 lbs/in	221 N/cm	280 N/cm
TENSILE STRENGTH AT BREAK	ASTM D6693	90 lbs/in	168 lbs/in	158 N/cm	294 N/cm
TENSILE ELONGATION AT YIELD	ASTM D6693	12 %	18 %	12 %	18 %
TENSILE ELONGATION AT BREAK	ASTM D6693	100 %	430 %	100 %	430 %
TEAR STRENGTH	ASTM D1004	42 lbs	52 lbs	187 N	231 N
PUNCTURE RESISTANCE	ASTM D4833	90 lbs	125 lbs	400 N	556 N
OXIDATION INDUCTION TIME (OIT) OR HIGH PRESSURE OIT (HPOIT)	ASTM D3895 ASTM D5885	100 min 400 min	180 min	100 min 400 min	180 min
CARBON BLACK CONTENT ⁷	ASTM D4218	2.0 %	2.2 %	2.0 %	2.2 %
CARBON BLACK DISPERSION	ASTM D5596	Pass			
STRESS CRACK RESISTANCE ⁸	ASTM D5397	500 hrs	> 1800 hrs	500 hrs	> 1800 hrs
BENZENE PERMEANCE	See Note ⁶	1.21 x 10 ⁻¹³ m/s or 3.40 x 10 ⁻¹⁰ m ² /s			
TOLUENE PERMEANCE	See Note ⁶	4.86 x 10 ⁻¹⁴ m/s or 4.72 x 10 ⁻¹⁰ m ² /s			
ETHYLBENZENE PERMEANCE	See Note ⁶	1.11 x 10 ⁻¹⁴ m/s or 3.70 x 10 ⁻¹⁰ m ² /s			
M & P-XYLENES PERMEANCE	See Note ⁶	1.27 x 10 ⁻¹⁴ m/s or 3.50 x 10 ⁻¹⁰ m ² /s			
O-XYLENE PERMEANCE	See Note ⁶	1.14 x 10 ⁻¹⁴ m/s or 3.31 x 10 ⁻¹⁰ m ² /s			
METHANE PERMEANCE	ASTM D1434	< 2.46E ⁻¹³ m/s			
TRICHLOROETHYLENE (TCE)	See Note ⁶	3.50 x 10 ⁻¹⁵ m/s or 2.30 x 10 ⁻¹⁰ m ² /s			
PERCHLOROETHYLENE (PCE)	See Note ⁶	3.48 x 10 ⁻¹⁵ m/s or 2.17 x 10 ⁻¹⁰ m ² /s			
MAXIMUM STATIC USE TEMPERATURE		180° F		82° C	
COLD TEMPERATURE IMPACT	ASTM D746	-40° F		-40° C	

⁶ Aqueous Phase Film Permeance.

Permeation of Volatile Organic Compounds through EVOH Thin Film Membranes and Coextruded LLDPE/EVOH/LLDPE Geomembranes, McWatters and Rowe, Journal of Geotechnical and Geoenvironmental Engineering© ASCE/September 2015. (Permeation is the Permeation Coefficient adjusted to actual film thickness - calculated at 1 kg/m²)
The study used to determine PCE and TCE is titled: Evaluation of diffusion of PCE & TCE through high performance geomembranes by Battista and Rowe, Queens University 8 Feb 2018.

⁷ No carbon black in barrier layers.

⁸ Test frequency according to GRI GM10, base polyethylene resin.

PRO-FORMA SHEET CONTENTS: The data listed in the Pro-Forma data sheet is representative of initial production runs. These values may be revised at anytime without notice as additional test data becomes available.

Absolute Barrier® X60BCS is a seven-layer co-extruded double-side textured geomembrane consisting of durable high-density polyethylene (HDPE) and an inner core of highly effective barrier resin, designed specifically as a barrier against methane, radon, landfill odors, and VOCs. High strength HDPE provides excellent chemical resistance and outdoor durability. A robust stabilization package that exceeds the industry standard; provides long-term protection from thermal oxidation and ultraviolet degradation in exposed applications. The aggressive surface texture provides excellent stabilization for earthen and secondary geosynthetics as well as work site safety.

Absolute Barrier®
THE ULTIMATE IN GAS CONTAINMENT

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance, odor transmission, longevity as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. VIAFLEX MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage. Limited Warranty available at www.viaflex.com

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Viaflex

27-0003 09/22

APPENDIX D
***UPDATED DESIGN AND INSTALLATION SCHEDULE OF THE GAS
COLLECTION AND CONTROL SYSTEM WELL FIELD EXPANSION
PLAN***

April 18, 2024
File No. 01204123.21-13

Baitong Chen, Air Quality Engineer, bchen@aqmd.gov
Nathaniel Dickel, Senior Air Quality Engineer, ndickel@aqmd.gov
Christina Ojeda, Air Quality Inspector, cojeda@aqmd.gov
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Subject: Updated Design and Installation Schedule of the Gas Collection and Control System
Well-Field Expansion Plan
Chiquita Canyon Landfill – Castaic, California

Dear Mr. Chen:

In accordance with Condition No. 15(b)(i) of the March 21, 2024 Modified Stipulated Order for Abatement (SOFA) pertaining to the Chiquita Canyon Landfill (Landfill) (Case No. 6177-4), Chiquita Canyon, LLC (Chiquita) provides the updated design and installation schedule of the gas collection and control system (GCCS) well-field expansion plan incorporating the wells under SOFA Condition No. 15(a) and the additional wells under Condition No. 15(b) and their associated piping.

Attachment A presents the updated “Proposed Overall GCCS Site Plan” drawing, prepared by SCS Engineers and dated April 16, 2024. This updated drawing illustrates the installation plan design for an average of three (3) wells per acre within the estimated extent of elevated temperature landfill conditions as depicted by the Reaction Committee in their monthly determinations and a minimum of two (2) wells per acre in any individual grid along with associated landfill gas (LFG) collection piping.

The wells will be single casing completions, with design depths ranging between 42 and 297 feet, as depicted in **Attachment B's** updated table titled “Proposed Well Schedule” also prepared by SCS and dated April 16, 2024. The well casings will be constructed using perforated and blank (solid) 8-inch diameter Chlorinated Poly Vinyl Chloride (CPVC) Schedule 80 and carbon steel pipe. The total length of 8-inch carbon steel well casings and 8-inch CPVC well casings will vary depending on temperatures encountered during drilling. If temperatures of the waste exceed 150 degrees Fahrenheit, then the well will be constructed of carbon steel instead of CPVC. The final number, depth, and design of the vertical LFG extraction wells may be subject to change based on field and/or other conditions.

The Landfill will continue to install new LFG header and lateral piping, associated tees, valves, and road crossings. The proposed LFG piping will continue to include 36-inch (39 feet), 24-inch (7,369 feet), 20-inch (20 feet), 18-inch (3,781 feet), 8-inch (1,875 feet), and 6-inch (14,170 feet) header and lateral piping to connect all vertical extraction wells to the proposed and existing GCCS.

The expected gas collection from the associated proposed LFG wells, header and lateral piping will be approximately 2,100 standard cubic feet per minute (scfm); a reduction in gas collection from the existing horizontal collectors is expected as new vertical wells are installed.

Mr. Baitong Chen

April 18, 2024

Page 2

These proposed upgrades of the additional wells and upgrades to the piping system are expected to be completed by August 30, 2024, weather, soil, and safety conditions permitting. Monthly updates on these upgrades will be included in the monthly report submitted to South Coast AQMD pursuant to SOFA Condition No. 8(m).

Please contact either of the undersigned if you have questions or require additional information.

Sincerely,

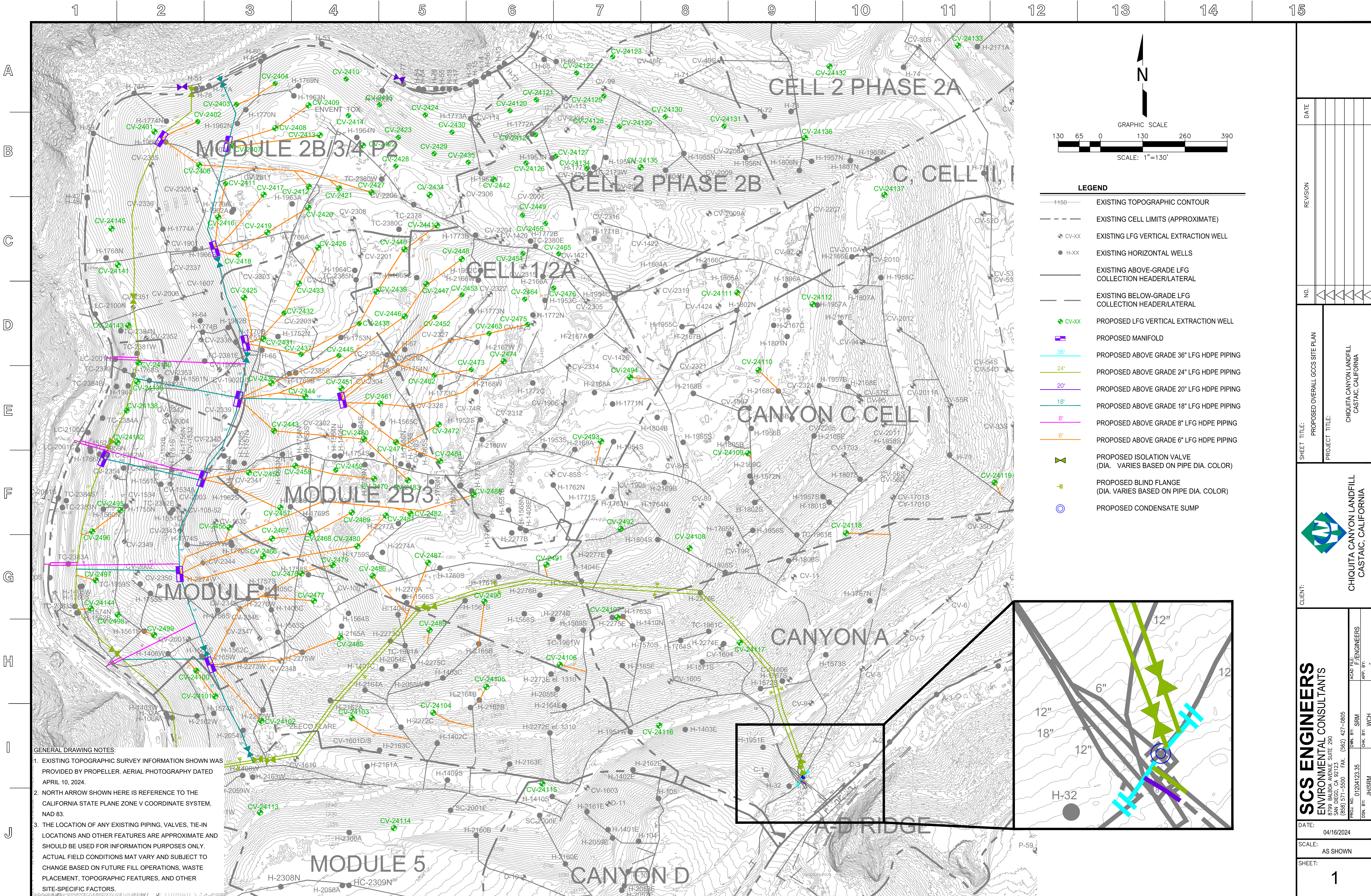


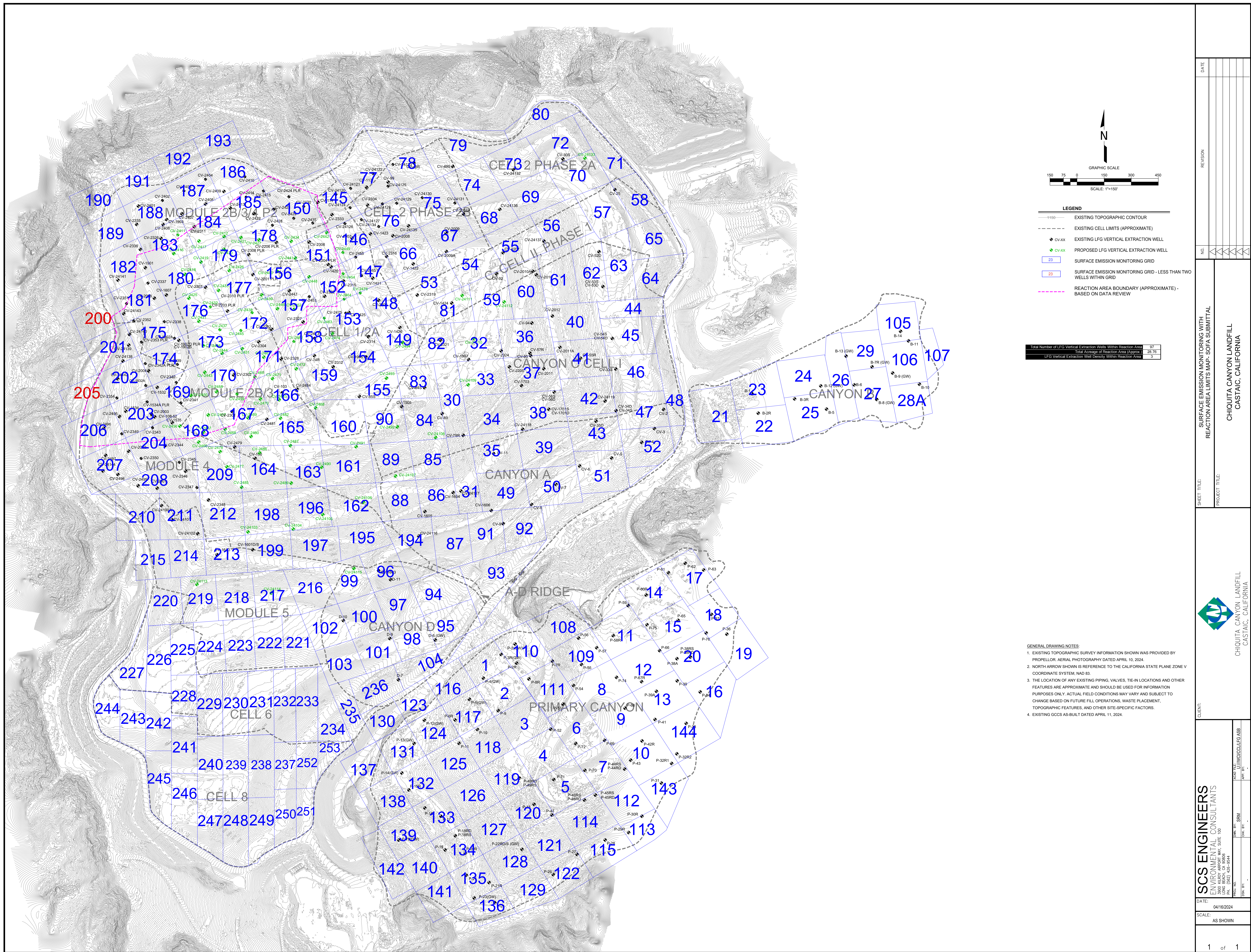
Bill Haley, PE
Project Director
SCS Engineers

Srividhya Viswanathan, PE
Vice President
SCS Engineers

cc: Robert Dick, PE, BCEE, SCS Engineers
Pablo Sanchez Soria, PhD, CIH, CTEH
Neal Bolton, PE, Blue Ridge Services, Inc.
Angie Perez, PhD, CIH, CTEH
Srividhya Viswanathan, PE, SCS Engineers
Patrick S. Sullivan, BCES, CCP, SCS Engineers

Attachment A
Proposed Overall GCCS Site Plan





Attachment B
Proposed Well Schedule

2024 LFG WELL DRILLING SCHEDULE																	
CHIQUITA CANYON LANDFILL, CASTAIC, CA																	
#	Well ID	Coordinates ³		Elevations		Depth to Base (ft)	Clearance Above Base >=15 ft.	Bore Depth ⁴ (ft)	Bore Diam. (in)	Casing size and Material Type ⁴	Perforated pipe (ft)	Solid Pipe ² (ft)	Gravel Pack (ft)	Depth to Top of Gravel Pack (ft)	Depth to Bottom of shallow Gravel Pack (ft)	Shallow Soil Backfill(ft)	Centralizers
		Northing	Easting	Surface	Base ¹												
1	CV-2401	1981918.267	6365410.820	1352	1283	69	17	52	36	8" CARBON STEEL	20	33	24	28	52	23	0
2	CV-2402	1981949.502	6365544.096	1360	1297	63	16	47	36	8" CARBON STEEL	25	23	29	18	47	13	0
3	CV-2403	1982002.248	6365663.255	1364	1305	59	17	42	36	8" CARBON STEEL	20	23	24	18	42	13	0
4	CV-2404	1982066.566	6365782.382	1369	1310	59	17	42	36	8" CARBON STEEL	20	23	24	18	42	13	0
5	CV-2406	1981815.941	6365548.148	1382	1250	132	30	102	36	8" CARBON STEEL	70	33	74	28	102	23	1
6	CV-2407	1981875.887	6365651.136	1387	1269	118	26	92	36	8" CARBON STEEL	60	33	64	28	92	23	0
7	CV-2408	1981929.433	6365782.798	1378	1265	113	31	82	36	8" CARBON STEEL	50	33	54	28	82	23	0
8	CV-2409	1981999.282	6365884.764	1381	1273	108	31	77	36	8" CARBON STEEL	45	33	49	28	77	23	0
9	CV-2410	1982080.558	6366000.616	1366	1316	50	18	32	36	8" CARBON STEEL	10	23	14	18	32	13	0
10	CV-2411	1981758.730	6365629.668	1385	1225	160	23	137	36	8" CARBON STEEL	105	33	109	28	137	23	2
11	CV-2412	1981749.304	6365885.804	1385	1193	192	25	167	36	8" CARBON STEEL	135	33	139	28	167	23	4
12	CV-2413	1981907.595	6365919.589	1381	1245	136	24	112	36	8" CARBON STEEL	80	33	84	28	112	23	1
13	CV-2414	1981967.930	6366007.370	1385	1275	110	28	82	36	8" CARBON STEEL	50	33	54	28	82	23	0
14	CV-2415	1982001.469	6366103.279	1368	1300	68	26	42	36	8" CARBON STEEL	20	23	24	18	42	13	0
15	CV-2416	1981655.349	6365607.103	1382	1195	187	20	167	36	8" CARBON STEEL	135	33	139	28	167	23	4
16	CV-2417	1981724.493	6365746.684	1387	1203	184	22	162	36	8" CARBON STEEL	130	33	134	28	162	23	4
17	CV-2418	1981540.108	6365669.325	1382	1145	237	25	212	36	8" CARBON STEEL	180	33	184	28	212	23	6
18	CV-2419	1981608.358	6365757.877	1387	1161	226	24	202	36	8" CARBON STEEL	170	33	174	28	202	23	6
19	CV-2420	1981684.455	6365884.354	1383	1168	215	28	187	36	8" CARBON STEEL	155	33	159	28	187	23	5
20	CV-2421	1981743.846	6365978.848	1382	1188	194	22	172	36	8" CARBON STEEL	140	33	144	28	172	23	4
21	CV-2422	1981876.310	6366051.965	1386	1245	141	29	112	36	8" CARBON STEEL	80	33	84	28	112	23	1
22	CV-2423	1981901.144	6366161.460	1380	1275	105	23	82	36	8" CARBON STEEL	50	33	54	28	82	23	0
23	CV-2424	1981969.891	6366244.235	1350	1301	49	17	32	36	8" CARBON STEEL	10	23	14	18	32	13	0
24	CV-2425	1981407.656	6365														

1. Base grades titled "CCLF liner limit with floor elevations 20230110" and obtained from Tetra Tech on October 2023.
2. Includes 3 of solid pipe stickup above grade.
3. The Horizontal Coordinates are based on California State Plane Zone 5.
4. If drill cutting temperatures are consistently greater than 150, contractor shall inform Site and Design Engineer for change in well casing materials.

2024 LFG WELL DRILLING SCHEDULE																	
CHIQUITA CANYON LANDFILL, CASTAIC, CA																	
#	Well ID	Coordinates ³		Elevations		Depth to Base (ft)	Clearance Above Base >=15 ft.	Bore Depth ⁴ (ft)	Bore Diam. (in)	Casing size and Material Type ⁴	Perforated pipe (ft)	Solid Pipe ² (ft)	Gravel Pack (ft)	Depth to Top of Gravel Pack (ft)	Depth to Bottom of shallow Gravel Pack (ft)	Shallow Soil Backfill(ft)	Centralizers
		Northing	Easting	Surface	Base ¹												
36	CV-2437	1981233.265	6365861.478	1371	1068	303	26	277	36	8" CARBON STEEL	245	33	249	28	277	23	9
37	CV-2438	1981328.093	6366040.691	1374	1067	307	30	277	36	8" CARBON STEEL	245	33	249	28	277	23	9
38	CV-2439	1981426.235	6366094.001	1374	1074	300	23	277	36	8" CARBON STEEL	245	33	249	28	277	23	9
39	CV-2440	1981556.729	6366180.008	1376	1125	251	24	227	36	8" CARBON STEEL	195	33	199	28	227	23	7
40	CV-2441	1981630.234	6366280.123	1381	1152	229	22	207	36	8" CARBON STEEL	175	33	179	28	207	23	6
41	CV-2442	1981771.361	6366454.012	1396	1210	186	29	157	36	8" CARBON STEEL	125	33	129	28	157	23	3
42	CV-2443	1980997.934	6365778.807	1358	1091	267	30	237	36	8" CARBON STEEL	205	33	209	28	237	23	7
43	CV-2444	1981103.358	6365874.702	1364	1072	292	25	267	36	8" CARBON STEEL	235	33	239	28	267	23	9
44	CV-2445	1981229.645	6365978.426	1371	1061	310	28	282	36	8" CARBON STEEL	250	33	254	28	282	23	10
45	CV-2446	1981350.110	6366180.731	1374	1070	304	27	277	36	8" CARBON STEEL	245	33	249	28	277	23	9
46	CV-2447	1981449.332	6366247.407	1382	1082	300	28	272	36	8" CARBON STEEL	240	33	244	28	272	23	9
47	CV-2448	1981526.446	6366356.092	1392	1106	286	24	262	36	8" CARBON STEEL	230	33	234	28	262	23	9
48	CV-2449	1981661.234	6366543.058	1399	1145	254	32	222	36	8" CARBON STEEL	190	33	194	28	222	23	7
49	CV-2450	1980869.189	6365701.336	1354	1092	262	30	232	36	8" CARBON STEEL	200	33	204	28	232	23	7
50	CV-2451	1981128.434	6365985.988	1366	1058	308	21	287	36	8" CARBON STEEL	255	33	259	28	287	23	10
51	CV-2452	1981348.223	6366272.978	1394	1070	324	27	297	36	8" CARBON STEEL	265	33	269	28	297	23	10
52	CV-2453	1981417.004	6366357.183	1393	1074	319	27	292	36	8" CARBON STEEL	260	33	264	28	292	23	10
53	CV-2454	1981543.821	6366544.547	1402	1098	304	32	272	36	8" CARBON STEEL	240	33	244	28	272	23	9
54	CV-2455	1981635.910	6366614.251	1404	1130	274	27	247	36	8" CARBON STEEL	215	33	219	28	247	23	8
55	CV-2456	1980700.408	6365641.165	1354	1076	278	31	247	36	8" CARBON STEEL	215	33	219	28	247	23	8
56	CV-2457	1980761.530	6365797.719	1367	1052	315	28	287	36	8" CARBON STEEL	255	33	259	28	287	23	10
57	CV-2458	1980890.277	6365843.893	1370	1060	310	28	282	36	8" CARBON STEEL	250	33	254	28	282	23	10
58	CV-2459	1980876.915	6365968.548	1375	1054	321	29	292	36	8" CARBON STEEL	260	33	26				

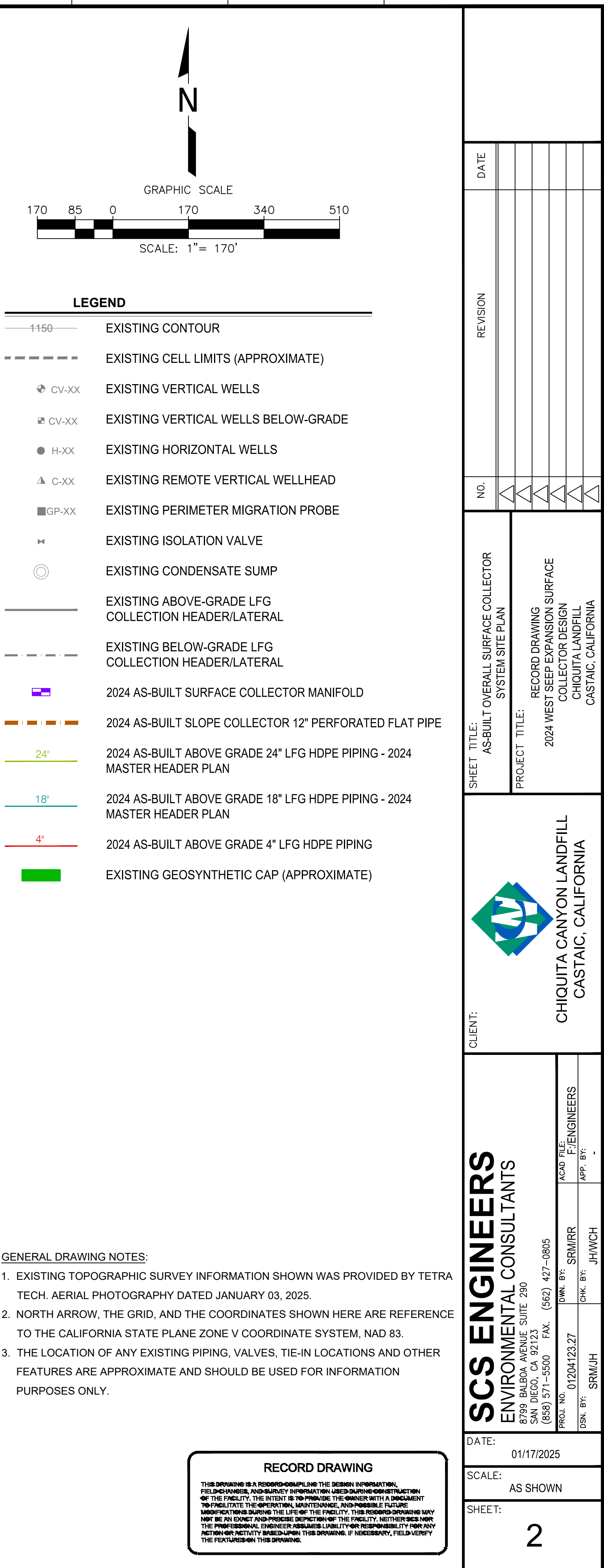
1. Base grades titled "CCLF liner limit with floor elevations 20230110" and obtained from Tetra Tech on October 2023.
2. Includes 3 of solid pipe stickup above grade.
3. The Horizontal Coordinates are based on California State Plane Zone 5.
4. If drill cutting temperatures are consistently greater than 150, contractor shall inform Site and Design Engineer for change in well casing materials.

#	Well ID	Coordinates ³		Elevations		Depth to Base (ft)	Clearance Above Base >=15 ft.	Bore Depth ⁴ (ft)	Bore Diam. (in)	Casing size and Material Type ⁴	Perforated pipe (ft)	Solid Pipe ² (ft)	Gravel Pack (ft)	Depth to Top of Gravel Pack (ft)	Depth to Bottom of shallow Gravel Pack (ft)	Shallow Soil Backfill(ft)	Centralizers
		Northing	Easting	Surface	Base ¹												
106	CV-24107	1980423.678	6366835.204	1339	1050	289	32	257	36	8" CARBON STEEL	225	33	229	28	257	23	8
107	CV-24108	1980637.016	6367056.869	1368	1060	308	31	277	36	8" CARBON STEEL	245	33	249	28	277	23	9
108	CV-24109	1980928.855	6367236.733	1389	1077	312	30	282	36	8" CARBON STEEL	250	33	254	28	282	23	10
109	CV-24110	1981184.762	6367269.199	1398	1087	311	29	282	36	8" CARBON STEEL	250	33	254	28	282	23	10
110	CV-24111	1981422.941	6367203.612	1403	1090	313	31	282	36	8" CARBON STEEL	250	33	254	28	282	23	10
111	CV-24112	1981387.327	6367436.266	1391	1097	294	32	262	36	8" CARBON STEEL	230	33	234	28	262	23	9
112	CV-24113	1979823.296	6365735.633	1240	1120	120	23	97	36	8" CARBON STEEL	65	33	69	28	97	23	0
113	CV-24114	1979775.834	6366147.202	1216	1031	185	28	157	36	8" CARBON STEEL	125	33	129	28	157	23	3
114	CV-24115	1979911.902	6366604.241	1240	1036	204	27	177	36	8" CARBON STEEL	145	33	149	28	177	23	4
115	CV-24116	1980091.199	6366963.376	1250	1108	142	25	117	36	8" CARBON STEEL	85	33	89	28	117	23	1
116	CV-24117	1980346.201	6367212.078	1305	1065	240	28	212	36	8" CARBON STEEL	180	33	184	28	212	23	6
117	CV-24118	1980683.144	6367538.235	1305	1073	232	25	207	36	8" CARBON STEEL	175	33	179	28	207	23	6
118	CV-24119	1980838.506	6367995.160	1274	1107	167	25	142	36	8" CARBON STEEL	110	33	114	28	142	23	3
119	CV-24120	1981982.673	6366504.473	1344	1265	79	22	57	36	8" CARBON STEEL	25	33	29	28	57	23	0
120	CV-24121	1982016.466	6366585.870	1342	1255	87	25	62	36	8" CARBON STEEL	30	33	34	28	62	23	0
121	CV-24122	1982099.082	6366709.653	1320	1245	75	28	47	36	8" CARBON STEEL	15	33	19	28	47	23	0
122	CV-24123	1982148.673	6366820.321	1308	1225	83	21	62	36	8" CARBON STEEL	30	33	34	28	62	23	0
123	CV-24124	1981908.818	6366583.285	1369	1220	149	27	122	36	8" CARBON STEEL	90	33	94	28	122	23	2
124	CV-24125	1982028.268	6366793.409	1335	1210	125	28	97	36	8" CARBON STEEL	65	33	69	28	97	23	0
125	CV-24126	1981821.499	6366553.844	1388	1210	178	26	152	36	8" CARBON STEEL	120	33	124	28	152	23	3
126	CV-24127	1981842.920	6366645.709	1382	1200	182	30	152	36	8" CARBON STEEL	120	33	124	28	152	23	3
127	CV-24128	1981929.897	6366762.144	1363	1185	178	26	152	36	8" CARBON STEEL	120	33	124	28	152	23	3
128	CV-24129	1981933.790	6366841.109	1355	1170	185	28	157	36	8" CARBON STEEL	125	33	129	28	157	23	3
129</																	

1. Base grades titled "CCLF liner limit with floor elevations 20230110" and obtained from Tetra Tech on October 2023.
2. Includes 3' of solid pipe stickup above grade.
3. The Horizontal Coordinates are based on California State Plane Zone 5.
4. If drill cutting temperatures are consistently greater than 150, contractor shall inform Site and Design Engineer for change in well casing materials.

4

APPENDIX E
SURFACE COLLECTOR TYPICAL DETAILS





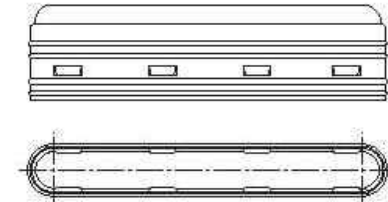
RECORD DRAWING

THIS DRAWING IS A RECORD COMPILING THE DESIGN INFORMATION, CHANGES, AND SURVEY INFORMATION USED DURING CONSTRUCTION OF THE FACILITY. THE INTENT IS TO PROVIDE THE OWNER WITH A DOCUMENT TO FACILITATE THE OPERATION, MAINTENANCE, AND POSSIBLE FUTURE MODIFICATIONS DURING THE LIFE OF THE FACILITY. THIS RECORD DRAWING MAY NOT BE AN EXACT AND COMPLETE REPRESENTATION OF THE FACILITY. NEITHER THE PROFESSIONAL ENGINEER ASSUMES LIABILITY OR RESPONSIBILITY FOR ANY ACTION OR ACTIVITY BASED UPON THIS DRAWING. IF NECESSARY, FIELD VERIFY THE FEATURES ON THIS DRAWING.





SECTION 3

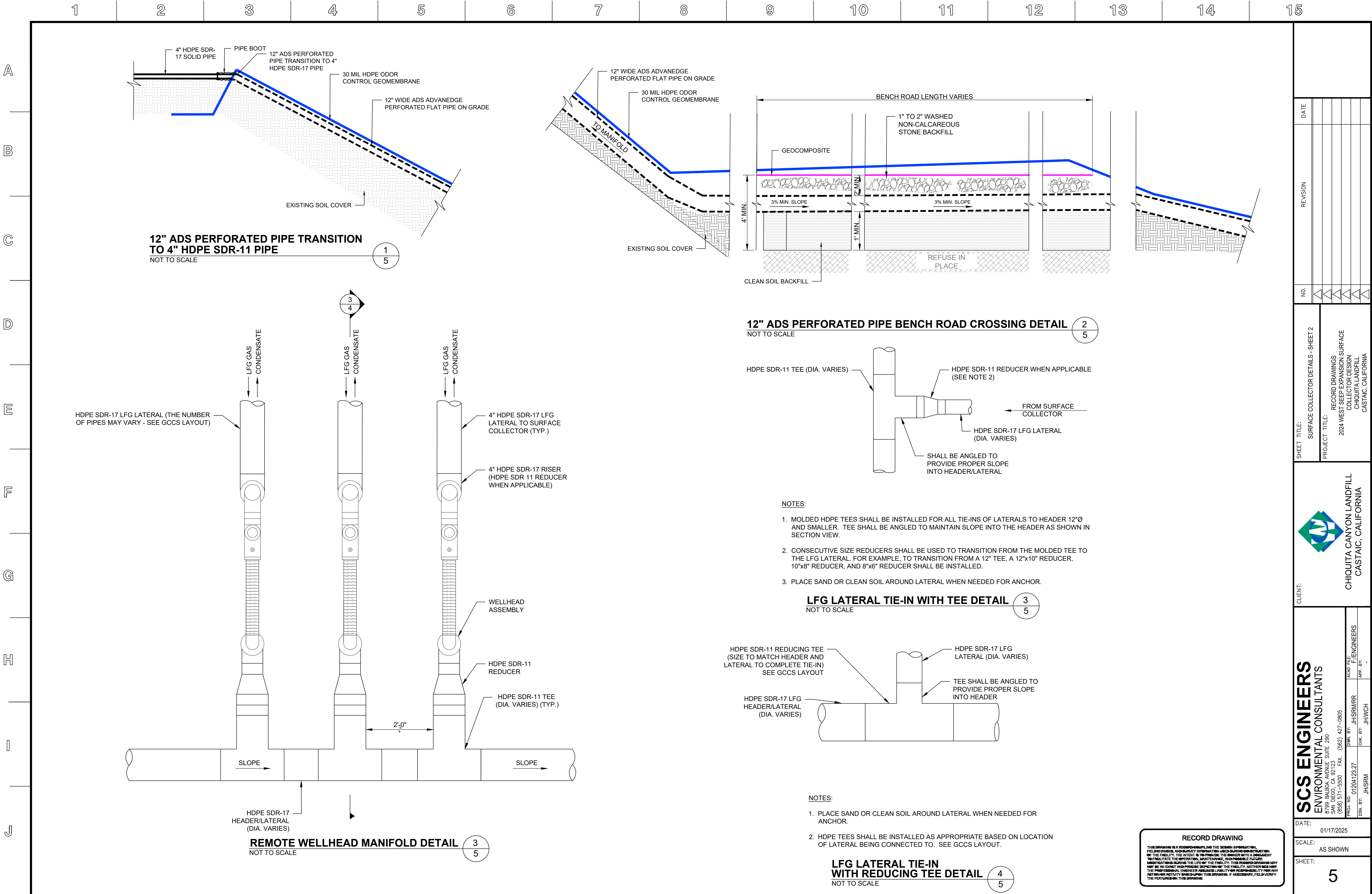


A large roll of grey, textured fireproofing material, likely mineral wool or fiberglass, with a black strap or fastener visible on the side.

$$\frac{1}{4}$$


THIS DRAWING IS A RECORD COMPILING THE DESIGN INFORMATION, FIELD CHANGES, AND SURVEY INFORMATION USED DURING CONSTRUCTION OF THE FACILITY. THE INTENT IS TO PROVIDE THE OWNER WITH A DOCUMENT TO FACILITATE THE OPERATION, MAINTENANCE, AND POSSIBLE FUTURE MODIFICATIONS DURING THE LIFE OF THE FACILITY. THIS RECORD DRAWING MAY NOT BE AN EXACT AND PRECISE DEPICTION OF THE FACILITY. NEITHER THE PROFESSIONAL ENGINEER ASSUMES LIABILITY OR RESPONSIBILITY FOR ANY ACTION OR ACTIVITY BASED UPON THIS DRAWING. IF NECESSARY, FIELD VERIFY THE FEATURES ON THIS DRAWING.

DATE:	01/17/2025
SCALE:	AS SHOWN
EET:	4



APPENDIX F
VIAFLEX ABSOLUTE BARRIER X60BCS MATERIAL SPECIFICATION

TECHNICAL DROP-IN SPECIFICATION

Absolute Barrier® X-Series & XT-Series 7-Layer Co-extruded Gas/VOC HDPE Barrier

The following technical drop-in specifications are provided as guidelines to be customized and finalized by the design engineer for preparing specific project specifications. This information is provided for reference purposes only and is not intended as a warranty or guarantee. Viaflex Inc. assumes no liability in connection with the use of this information. Please visit the Viaflex website at www.viaflex.com for current product specification sheets.

Index

Description

1. General
2. Related Work
3. Reference Standards
4. Quality Assurance
5. Manufactures Qualifications
6. Installer Qualifications
7. Warranties

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2. RLC Materials
3. Seaming Materials
4. Ballast System

Submittals

1. Pre-Installation Requirements
2. Post-Installation Requirements

Construction

1. Shipping, Handling & Storage
2. Subgrade Preparation
3. RLC Placement
4. Field Seams
5. Repair Procedures
6. Ballasting

Table 1: Required RLC Properties

7 LAYER CO-EXTRUDED GAS/VOC HDPE BARRIER GEOMEMBRANE SPECIFICATION

The 7-layer laminated membrane consists of very flexible, linear, low-density polyethylene (LLDPE) and an inner core of chemically resistance EVOH barrier resin. The 7-layer laminated geomembranes serve as covers for the repelling of water and infiltration of oxygen into the landfill as well as containment of methane/H₂S and other harmful VOC gases into the environment. The inner core of the barrier layer is designed specifically to act as a barrier to VOCs such as radon, methane, and hydrocarbons. As a cover, they can repel liquids to prevent leakage into the landfill, prevent leachate buildup, and provide a barrier to harmful methane and other VOC migration out of the landfill into the environment. It is of great importance that the 7-layer laminated reinforced geomembrane be free from defects and installed without damage.

A. DESCRIPTION

1. GENERAL:

The purpose of this specification is to provide details of Manufacturing Quality Control (MQC), Manufacturing Quality Assurance (MQA), Construction Quality Control (CQC), and Construction Quality Assurance (CQA) for the manufacture and pre-assembly of geomembrane products. The Contractor shall furnish all labor, material, and equipment to install the 7-layer co-extruded HDPE barrier geomembrane including all necessary and incidental items as detailed or required to complete the installation in accordance with the Contract Drawing and these Specifications

2. RELATED WORK:

Related Contract Work is described in the following section of the specification as approved by the CQA Engineer.

3. REFERENCE STANDARDS:

ASTM D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.

ASTM D5994 Standard Test Method for Measuring Core Thickness of Textured Geomembranes.

ASTM D7466 Standard Test Method for Measuring Asperity Height of Textured Geomembranes.

ASTM D6693 Standard Test Method for Determining Tensile Properties of Non-Reinforced Polyethylene and Non-Reinforced Flexible Polypropylene Geomembranes.

ASTM D1004 Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.

ASTM D4218 Standard Test Method for Determining Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique.

ASTM D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.

ASTM D3895 Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry.

ASTM D5885 Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry.

4. QUALITY ASSURANCE:

Quality Assurance during installation of 7-layer co-extruded HDPE barrier geomembrane will be provided by the Owner as described in the accompanying Project CQA Manual.

5. MANUFACTURERS QUALIFICATIONS:

- a. The Manufacturer shall have previously demonstrated his ability to produce the required 7-layer co-extruded HDPE barrier geomembrane by having successfully manufactured a minimum of 10,000,000 ft² of 7-layer co-extruded HDPE barrier geomembrane (or similar material).
- b. Manufacturer must be ISO 9001 certified

1. INSTALLER QUALIFICATIONS:

The 7-layer co-extruded HDPE barrier geomembrane Installer shall have installed a minimum of 500,000 ft² of HDPE Geomembrane (or similar material).

7. WARRANTIES:

The manufacturer of the 7-layer co-extruded HDPE barrier geomembrane will warrant the material to the installer on a pro rata basis for up to 20 years after the final acceptance of the work, based on thickness, the application and location of the installation. This warranty shall include but not be limited to defects related to workmanship and manufacturing.

B. MATERIALS

1. GENERAL:

The materials supplied under these Specifications shall consist of first-quality products designed and manufactured specifically for the purpose of this work, which shall have been satisfactorily demonstrated, by prior use, to be suitable and durable for such purposes.

2. 7-LAYER CO-EXTRUDED GAS/VOC HDPE BARRIER GEOMEMBRANE MATERIALS:

- a. 7-layer co-extruded Gas/VOC HDPE barrier geomembrane shall be manufactured to meet the following requirements:
 1. Provide finished product free from holes, pin holes, bubbles, blisters, excessive gels, undispersed resins and/or carbon black, or contamination by foreign matter.
2. 7-layer co-extruded Gas/VOC HDPE barrier geomembrane shall be a High-Density Polyethylene Geomembrane with an EVOH inner core as well as containing carbon black and stabilizers for resistance to degradation
- b. 7-layer co-extruded Gas/VOC HDPE barrier geomembrane shall be a High-Density Polyethylene Geomembrane with an EVOH inner core as well as containing carbon black and stabilizers for resistance to degradation. b. Approved 7-layer Co-extruded HDPE Barrier Geomembrane:
 1. Absolute Barrier X40BAL Absolute Barrier X60BAL Absolute Barrier X60BCSAs manufactured by Viaflex of Sioux Falls, SD.
 2. Equal material, as approved by the Engineer.

C. SUBMITTALS

The Contractor shall submit the following to the CQA Engineer:

1. PRE-INSTALLATION REQUIREMENTS:

Prior to 7-layer co-extruded Gas/VOC HDPE barrier geomembrane installation the Contractor shall submit the following:

- a. Certificate of Conformance and Sample: Prior to shipping to the site, the Contractor shall submit a certificate or affidavit signed by a legally authorized official of the Manufacturer for the 7-layer co-extruded Gas/VOC HDPE barrier geomembrane attesting that the 7-layer co-extruded Gas/VOC HDPE barrier geomembrane meets the physical and manufacturing requirements stated in these Specifications. The Contractor shall also submit a sample of the 7-layer co-extruded Gas/VOC HDPE barrier geomembrane to be used (sample may be of different color). The sample shall be labeled with the product name and be accompanied by the Manufacturer's specifications.
- b. Shipping, Handling, and Storage Instructions: The Manufacturer's plan for shipping, handling, and storage will be submitted for review.
- c. Installation Procedures:
Submit installation procedures for carrying out the work. Installation procedures to be addressed shall include but not be limited to material installation, repair, and protection to be provided in the event of rain or strong winds. With regard to protection, the Contractor shall provide a plan of sufficiently anchoring the 7-layer co-extruded Gas/VOC HDPE barrier geomembrane to satisfy the Contractor's Performance Warranty. This plan shall be approved by the Engineer prior to construction.
- d. Furnish copies of the delivery tickets or other approved receipts as evidence for materials received that will be incorporated into the construction.

2. POST-INSTALLATION REQUIREMENTS:

Upon completion of the 7-layer co-extruded Gas/VOC HDPE barrier geomembrane installation, the Contractor shall submit the following:

- a. Completed material performance warranty.

D. SITE PREPARATION AND INSTALLATION

1. Installation shall be in done in accordance with the Manufacturers Geomembrane Installation Guidelines.

TABLE 1:

Required 7 layer co-extruded Gas/VOC HDPE barrier geomembrane properties 40 mil

PROPERTY	TEST METHOD	IMPERIAL UNITS	METRIC UNITS	IMPERIAL MIN. ROLL AVERAGES	METRIC MIN. ROLL AVERAGES
Thickness	ASTM D5199	mils	mm	40	1.02
Weight		lbs/msf	g/m ²	203	991
Tensile Strength	ASTM D6693	lbs	N/cm	60	105
Tensile Elongation	ASTM D6693	%		12	
Tear Resistance	ASTM D1004	lbs	N	28	125
Puncture Resistance	ASTM D4833	lbs	N	72	320
Standard OIT	ASTM D3895	min		100	
High Pressure HPOIT	ASTM D5885	min		400	
Carbon Black	ASTM D4218	%		2	
Benzene Permeance	See Note ²	2.83 x 10 ⁻¹⁰ m ² /sec or 1.45 x 10 ⁻¹³ m/s			
Toluene Permeance	See Note ²	3.94 x 10 ⁻¹⁰ m ² /sec or 5.83 x 10 ⁻¹⁴ m/s			

Ethylbenzene Permeance	See Note ²	$3.09 \times 10^{-10} \text{ m}^2/\text{sec}$ or $1.34 \times 10^{-14} \text{ m/s}$
M & P-Xylenes Permeance	See Note ²	$2.91 \times 10^{-10} \text{ m}^2/\text{sec}$ or $1.52 \times 10^{-14} \text{ m/s}$
O-Xylene Permeance	See Note ²	$2.76 \times 10^{-10} \text{ m}^2/\text{sec}$ or $1.37 \times 10^{-14} \text{ m/s}$
Methane Permeance	ASTM D1434	$< 3.70\text{E}^{-13} \text{ m/s}$
Trichloroethylene (TCE)	See Note ²	$1.92 \times 10^{-10} \text{ m}^2/\text{sec}$ or $4.20 \times 10^{-15} \text{ m/s}$
Perchloroethylene (PCE)	See Note ²	$1.81 \times 10^{-10} \text{ m}^2/\text{sec}$ or $4.18 \times 10^{-15} \text{ m/s}$

TABLE 2:

Required 7 layer co-extruded Gas/VOC HDPE barrier geomembrane properties 60 mil

PROPERTY	TEST METHOD	IMPERIAL UNITS	METRIC UNITS	IMPERIAL MIN. ROLL AVERAGES	METRIC MIN. ROLL AVERAGES
Thickness	ASTM D5199	mils	mm	60	1.52
Weight		lbs/msf	g/m ²	302	1474
Tensile Strength	ASTM D6693	lbs	N/cm	90	158
Tensile Elongation	ASTM D6693	%		12	
Tear Resistance	ASTM D1004	lbs	N	42	187
Puncture Resistance	ASTM D4833	lbs	N	108	480
Standard OIT	ASTM D3895	min		100	
High Pressure HPOIT	ASTM D5885	min		400	
Carbon Black	ASTM D4218	%		2	
Benzene Permeance	See Note ²	3.40 x 10 ⁻¹⁰ m ² /sec or 1.21 x 10 ⁻¹³ m/s			
Toluene Permeance	See Note ²	4.72 x 10 ⁻¹⁰ m ² /sec or 4.86 x 10 ⁻¹⁴ m/s			
Ethylbenzene Permeance	See Note ²	3.70 x 10 ⁻¹⁰ m ² /sec or 1.11 x 10 ⁻¹⁴ m/s			
M & P-Xylenes Permeance	See Note ²	3.50 x 10 ⁻¹⁰ m ² /sec or 1.27 x 10 ⁻¹⁴ m/s			
O-Xylene Permeance	See Note ²	3.31 x 10 ⁻¹⁰ m ² /sec or 1.14 x 10 ⁻¹⁴ m/s			
Methane Permeance	ASTM D1434	< 2.46 x 10 ⁻¹³ m/s			
Trichloroethylene (TCE)	See Note ²	2.30 x 10 ⁻¹⁰ m ² /sec or 3.50 x 10 ⁻¹⁵ m/s			
Perchloroethylene (PCE)	See Note ²	2.17 x 10 ⁻¹⁰ m ² /sec or 3.48 x 10 ⁻¹⁵ m/s			

TABLE 3:

Required 7 layer co-extruded Gas/VOC HDPE barrier geomembrane properties 60 mil textured two-sided

PROPERTY	TEST METHOD	IMPERIAL UNITS	METRIC UNITS	IMPERIAL MIN. ROLL AVERAGES	METRIC MIN. ROLL AVERAGES
Core Thickness	ASTM D5994	mils	mm	57	1.45
Asperity Height	ASTM D4766			16	0.41
Weight		lbs/msf	g/m ²	317	1548
Tensile Strength	ASTM D6693	lbs	N/cm	90	158
Tensile Elongation	ASTM D6693	%		12	
Tear Resistance	ASTM D1004	lbs	N	42	187
Puncture Resistance	ASTM D4833	lbs	N	90	400
Standard OIT	ASTM D3895	min		100	
High Pressure HPOIT	ASTM D5885	min		400	
Carbon Black	ASTM D4218	%		2	
Benzene Permeance	See Note ²	3.40 x 10 ⁻¹⁰ m ² /sec or 1.21 x 10 ⁻¹³ m/s			
Toluene Permeance	See Note ²	4.72 x 10 ⁻¹⁰ m ² /sec or 4.86 x 10 ⁻¹⁴ m/s			
Ethylbenzene Permeance	See Note ²	3.70 x 10 ⁻¹⁰ m ² /sec or 1.11 x 10 ⁻¹⁴ m/s			
M & P-Xylenes Permeance	See Note ²	3.50 x 10 ⁻¹⁰ m ² /sec or 1.27 x 10 ⁻¹⁴ m/s			
O-Xylene Permeance	See Note ²	3.31 x 10 ⁻¹⁰ m ² /sec or 1.14 x 10 ⁻¹⁴ m/s			
Methane Permeance	ASTM D1434	< 2.46E ⁻¹³ m/s			
Trichloroethylene (TCE)	See Note ²	2.30 x 10 ⁻¹⁰ m ² /sec or 3.50 x 10 ⁻¹⁵ m/s			
Perchloroethylene (PCE)	See Note ²	2.17 x 10 ⁻¹⁰ m ² /sec or 3.48 x 10 ⁻¹⁵ m/s			

Notes:

1. The Engineer may allow alternates to these requirements.
2. Aqueous Phase Film Permeance
 - a. Permeation of Volatile Organic Compounds through EVOH Thin Film Membranes and Coextruded LLDPE/EVOH/LLDPE Geomembranes, McWatters and Rowe, Journal of Geotechnical and Geoenvironmental Engineering© ASCE/September 2015. (Permeation is the Permeation Coefficient adjusted to actual film thickness - calculated at 1 kg/m³.) The study used to determine PCE and TCE is titled: Evaluation of diffusion of PCE & TCE through high-performance geomembranes by Di Battista and Rowe, Queens University 8 Feb 2018.

APPENDIX G
GEOSYNTHETICS SPECIFICATIONS AND
CONSTRUCTION QUALITY ASSURANCE REQUIREMENTS

SECTION 02771
HIGH DENSITY POLYETHYLENE GEOMEMBRANE

1.0 GENERAL

1.1 Summary

- A. This Section sets forth the requirements for the High-Density Polyethylene (HDPE) geomembrane.
- B. The Contractor shall assure that the Engineer, or the Engineer's designated representative, shall at all times have safe access to the work for the purpose of monitoring, observation, and QC implementation.
- C. An independent engineering firm under contract to the Owner, (CQA Consultant) will conduct Construction Quality Assurance (CQA) monitoring, observation, and documentation. The Contractor shall coordinate and cooperate with the Engineer during all sampling, testing, and certification required by these Technical Specifications.
- D. The Owner will directly purchase the HDPE geomembrane material and will contract directly with the "Geosynthetics Contractor" to install the geomembrane and other liner related geosynthetics for this project. The Contractor will be responsible for overall project coordination and integration. Direct Payment for liner related geosynthetic materials and the Geosynthetics Installation Contractor will be the only responsibility of the Owner with regard to the work.

1.2 Work Included

- A. The specified geomembrane shall be furnished and installed as shown on the Drawings and as required herein for proper installation and functioning of the composite liner system for solid waste and leachate containment.
- B. The acceptance and approval of the geomembrane is a phased process that includes manufacturer's certifications, manufacturer's quality control testing, conformance testing, and destructive seam testing. It is a requirement of these Specifications that the manufacturer's certification(s), and quality control test results for the geomembrane, raw resin, and extrudate rod or bead shall be received (by official submittal), reviewed, and approved by the CQA Consultant prior to shipment of these materials to the site.

1.3 Quality Control

- A. The number of resin lots utilized in the production of the geomembrane must be minimized each lot (i.e. resin lot associated with the geomembrane) contains a minimum of 40 rolls of finished product.
- B. Use adequate numbers of skilled workman who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- C. The manufacturer will not charge any time or material expenses to the Owner, related to a plant visit by the Engineer, the CQA Monitor or designed representative to visit the plant during manufacturing.
- D. Render assistance as necessary for CQA Monitor to collect product samples.

1.4 Responsibilities of the General Contractor

- A. The Earthwork Contractor will be responsible for overall project scheduling, coordination, support (such as restroom facilities), related earthwork, such as grade preparation, anchor trench excavation and backfill, surveying and staking, protection of the geomembrane after

installation, and all other work not directly related to geomembrane installation as necessary to provide a seamless construction project.

- B. The Geosynthetics installations schedule shall be incorporated into the General Contractors Schedule to provide seamless project scheduling.
- C. The Contractor shall coordinate the work so as to minimize the number of mobilizations required by the Geosynthetics Contractor. See Section 01010 Coordination regarding mobilizations. The General Contractor will be required to pay for excessive Geosynthetic Contractor mobilizations per Section 01010.

1.5 Responsibilities of the Geosynthetic Contractor

- A. The Owner will pay the Geosynthetics Contractor and supplier directly for the liner materials associated with this project. The Geosynthetics Contractor will be responsible for superintendence, quality control, routing of submittals, scheduling, coordination of shipping, and otherwise interact with the Earthwork Contractor as is typical for a landfill liner installation project.
- B. The geosynthetic materials will be sole sourced for this project unless they are not readily available from the sole source provider described herein. In cases where geosynthetic materials are not available from the sole source supplier, they will be recommended by the Geosynthetics Contractor and paid directly by the Owner.
- C. The Geosynthetics Contractor will be responsible for coordinating with Owner and General Contractor to ensure that adequate materials are ordered to account to lap and scrap, process submittals, provide their own quality control, and install the geosynthetics as is typically done on a liner project.
- D. The Geosynthetics Contractor shall provide the quantities to the Construction Quality Assurance (CQA) Manager for verification prior to placing the order.
- E. Geosynthetics submittals shall be submitted directly to the CQA Manager and a copy provided to the General Contractor as a courtesy.
- F. The Geosynthetics Contractor shall be responsible for unloading and stockpiling the geomembrane materials.

1.6 Responsibilities of the Geomembrane Supplier

- A. The Geomembrane Supplier will be responsible for coordinating with the Geosynthetics Contractor regarding material quantities, submittals, shipping method and schedule, manufacturing and delivery schedule.
- B. The Geomembrane Supplier will bill the Owner directly for the ordered materials, sales tax, and shipping.

1.7 Submittals Required

- A. The Contractor shall thoroughly review the Specifications and identify all required project submittals. The submittals listed below are intended as a general summary of the submittal items contained in this Section. This submittal list does not release the Contractor from the responsibility of identifying and providing all information requested.
 - 1. Manufacturer's certified quality control test results as specified herein.
 - 2. Manufacturer's and Contractor's quality control program including shipping, handling, storage, and installation.
 - 3. Installation drawings/panel layout.
 - 4. Samples of geomembrane material.
 - 5. Interface shear strength laboratory test reports/samples.
 - 6. Certified conformance and destructive seam test results.

7. Warranties as specified herein.
8. Geomembrane installer's subgrade certification.
9. Contractor's daily documentation.
10. Quality Control (QC) and Installer's Qualification/Resumes.
11. Record Drawings.

1.8 Warranty

- A. Installation: Provide an installation warranty for geomembrane material in compliance with the conditions of the Contract. Provide a minimum of 2 years non-pro rate warranty for the installation against defects.

2.0 PRODUCTS

2.1 Geomembrane Resin

- A. General
 1. Resin for the geomembrane shall be virgin, first quality high density polyethylene (HDPE) resin produced in North America and compounded and manufactured specifically for the purpose of producing HDPE geomembranes for landfill liners. There shall be no intermixing with other resin types. Reclaimed polymer shall not be added to the geomembrane resin. The manufacturer may recycle edge trim from the roll being produced. Edge trim shall be returned immediately to the process but shall not exceed 2 percent of the total resin required. Edge trim that has been stored and edge trim from other manufacturing lines shall not be recycled.
- B. Physical Properties
 1. HDPE resin shall meet the following minimum specifications:

Table 02771-1
Properties for HDPE Resin

Test	Test Method	Unit	Requirements
Density ¹	ASTM D1505	g/cc	0.932 min.
Resin Properties	ASTM D1248	% virgin polymers	97
Melt Flow Index	ASTM D1238 Condition E	g/10 min	<1.0
Notes:			
1. Base resin density without carbon black added.			

- C. Resin Manufacturer Certification and Testing
 1. One set of tests shall be performed per batch of resin. At a minimum, the geomembrane manufacturer shall sample and test each compartment of each rail car or truck to ensure that product purity was maintained during shipment. Certified test results shall be submitted to and approved by the CQA Consultant and/or Engineer at least 15 working days prior to shipping geomembrane to the site.

2.2 Geomembrane Rolls

- A. General
 1. Geomembrane rolls shall be new, first quality seamless high-density polyethylene (HDPE) manufactured in North America specifically for the purpose of this project. The geomembrane rolls shall have no holes, pinholes, bubbles, blisters, gels, nicks, cuts on liner edges, or contamination by foreign matter. Geomembrane shall be supplied in rolls;

folding shall not be permitted. All additives shall be thoroughly dispersed throughout the geomembrane.

B. Geomembrane

1. The 60-mil and 30-mil HDPE geomembrane shall be double sided textured.
2. Geomembrane shall have physical properties that equal or exceed the minimum average roll values specified in Table 02771-2, or the most recent GRI GM 13 values. The texturing shall be produced by the blown-film method, or approved equivalent, with the texturing uniformly distributed on the surface of the sheet.
3. Textured geomembrane, if produced by coextrusion secondary attachment, shall consist of textured material attached to a base sheet. The base sheet shall have physical properties that meet or exceed those specified in Table 02771-2. The coextruded secondary attachment sheet shall remain intact and shall be resistant to separation from the base sheet as a result of abrasion and contact with chemicals encountered in solid waste landfill applications. All work associated with secondary attachment shall be performed by the manufacturer of the base sheet.

TABLE 02771-2
Properties HDPE Geomembrane

Physical Property	Test Method	Unit	60 mil	30 mil	Frequency
Thickness mils (min. ave) • Lowest individual for 8 out of 10 values • Lowest of individual for any of the 10 values	ASTM D5994	mils	Nom. -5% -10 -15	Nom. -5% -10 -15	Per Roll
Asperity Height (min. ave.)	ASTM D7466	mils	18	16	Every 2 nd roll (1)
Density (min. ave.)	ASTM D792 ASTM D1505	g/cc	0.940	0.940	200,000 lbs
Tensile Properties (min. ave.) (2) • Tensile Strength at Yield • Tensile Strength at Break • Elongation at Yield • Elongation at Break	ASTM D6693 Type IV	lb/in lb/in % %	126 90 12 100	63 45 12 100	20,000 lbs
Tear Resistance (min. ave.)	ASTM D1004	lb	42	21	45,000 lbs
Puncture Resistance (min. ave.)	ASTM D4833	lb	90	45	45,000 lbs
Stress Crack Resistance (3)	ASTM D5397	hrs	500	500	Per GRI-GM10
Carbon black content (range)	ASTM D4218 (4)	%	2 to 3	2 to 3	20,000 lbs
Carbon black dispersion	ASTM D5596	N/A	Note 5	Note 5	45,000 lbs
Oxidative Induction Time (OIT) (min. ave.)(6) (a) Standard OIT ----- (b) High Pressure OIT	ASTM D3895 ASTM D5885	min. min	100 400	100 400	200,000 lbs
Oven Aging at 85 °C (6)(7) (a) Standard OIT (min. ave.) % retained after 90 days ----- (b) High Pressure OIT (min. ave.) % retained after 90 days	ASTM D5721 ASTM D3895 ASTM D5885	% %	55 80	55 80	Per each formulation
UV Resistance (8) a) Standard OIT (min. ave.) ----- (b) High Pressure OIT (min. ave.) - % retained after 1600 hrs (10)	ASTM D7238 ASTM D3895 ASTM D5885	 %	N.R. (9) 50	N.R. (9) 50	Per each formulation

Notes:

- (1) Alternate the measurement side for double sided textured sheet
- (2) Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction.
Yield elongation is calculated using a gage length of 1.3 inches
Break elongation is calculated using a gage length of 2.0 inches
- (3) P-NCTL test is not appropriate for testing geomembranes with textured or irregular rough surfaces. Test should be conducted on smooth edges of textured rolls or on smooth sheets made from the same formulation as being used for the textured sheet materials. The yield stress used to calculate the applied load for the SP-NCTL test should be the manufacturer's mean value via MQC testing.
- (4) Other methods such as D 1603 (tube furnace) or D 6370 (TGA) are acceptable if an appropriate correlation to D 4218 (muffle furnace) can be established.
- (5) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
9 in Categories 1 or 2 and 1 in Category 3
- (6) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.
- (7) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
- (8) The condition of the test should be 20 hr. UV cycle at 75 °C followed by 4 hr. condensation at 60 °C.
- (9) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
- (10) UV resistance is based on percent retained value regardless of the original HP-OIT value.

C. Quality Control – Minimum Lot/Batch

1. Geomembrane shall be monitored throughout the manufacturing process for product integrity and consistency. The manufacturer shall sample rolls for the following physical properties and at the minimum frequency or per batch of resin in accordance with GRI - GM13, whichever results in the greatest number of tests:
 - a. Geomembrane Density
 - b. Geomembrane Thickness
 - c. Carbon Black Content
 - d. Carbon Black Dispersion
 - e. Tensile characteristics (yield strength, elongation at yield, break strength, elongation at break)
 - f. Environmental Stress Cracking
 - g. Puncture resistance
 - h. Tear Resistance
 - i. Asperity Height
2. In order to minimize the number of conformance samples and tests, the minimum batch or lot size allowed for geomembrane rolls furnished on this project will be 75,000 square feet.
3. Certified test results shall be submitted to and approved by the CQA Consultant at least fifteen (15) working days prior to geomembrane delivery to site. The Contractor shall submit a list that indicates date of production, plant location, resin batch number, manufacturing line number, identification number, and square footage of each geomembrane roll. Rolls shall be listed in the order of production with the status of the roll (rejected or approved for shipment). All rolls shall be included in the list whether or not approved for shipment to the project. This information will be used by the CQA Consultant to affix rolls to a specific 100,000 square foot, or smaller, lot for conformance testing per applicable portions of this Section.

D. Roll Identification

1. Each roll shall be labeled or tagged with the roll identification number, product identification number, name of manufacturer, date and location of production, product type and grade, lot number, and physical dimensions. The label or tag information shall be affixed or attached to the roll at all times during deployment of the roll.

E. Warranty

1. The geomembrane manufacturer shall furnish a written liner warranty on a pro-rata basis for a period of five years. The warranty shall be against manufacturing defects or workmanship and against deterioration due to ozone, ultraviolet light rays, and/or other normal weather aging.
2. The warranty shall be limited to replacement of material only and shall not cover installation of said material. It shall not cover damage due to vandalism, acts of animals, earthquakes, and other unusual acts of God.

F. Quality Control (QC) Program

1. The geomembrane manufacturer and the Contractor, each, shall submit a complete description of their quality control program, as applicable, for manufacturing, handling, installing, testing, repairing, and providing a completed lining in accordance with requirements of these Technical Specifications. The description shall include, but not be limited to:
 - a) Polymer resin supplier.
 - b) Product identification.

- c) Acceptance testing.
- d) Fabrication and production testing.
- e) Installation testing.
- f) Documentation of changes.
- g) Alterations and repairs.
- h) Retests and acceptance.

G. Interface Shear

1. The Owner and CQA Consultant shall provide for direct shear testing for interface strength in accordance with ASTM Standard D5321 "Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic Friction by the Direct Shear Method." Issues and procedures related to soil preparation shall be governed by ASTM D3080 "Standard Method for Direct Shear Test of Soils Under Consolidated Drained Conditions."
2. The laboratory testing equipment shall be capable of providing the following:
 - a. Total strain of at least 2 inches.
 - b. Constant rate of strain.
 - c. Test sample size shall be 12-inches by 12-inches.
 - d. Means of producing and maintaining "saturated" conditions.
3. The CQA Consultant shall obtain samples of geosynthetic materials used for the project and appropriate soil samples and shall arrange for shipment of the samples to an independent Geosynthetic Accreditation Institute (GAI)-approved testing laboratory for direct shear testing. Procedures presented in section 7.5.2 of ASTM D3080 shall be used to prepare soil test specimens for direct placement in the shear box, compacted and moisture conditioned as specified in Section 02205, Table 02205-2, for low-permeability material. Shearing shall take place once the sample is fully consolidated.
4. Testing at each of the normal stresses shall be undertaken on individual samples and multi-stage testing of the sample will not be allowed. The normal stress shall be applied in a single increment. Shearing shall take place at a constant strain rate of 0.04 inch/min. (1.02 millimeter /min). All tests shall be run until a constant shear stress is achieved and in no case shall a test be terminated at total strain of less than 1-inch.
5. Testing frequency shall be 1/300,000 square feet with a minimum of two tests for each configuration and shall be performed and shall meet the requirements in Table 02771-3.

**Table 02771-3
Interface Shear Testing**

Test No.	Test Configuration	Pre-Soak	Minimum Acceptable Large Displacement Interface Shear Strength	
			Normal Stress (lb/ft ²)	Shear Stress (lb/ft ²)
1	Gravel Drainage Layer	48 Hours		
	16 oz/sy Non-woven Geotextile		3,000	824
	60 mil DST HDPE Geomembrane		6,000	1,588
2	60 mil DST HDPE Geomembrane	48 Hours	12,000	2,737
	Geosynthetic Clay Liner			
	Compacted Low Permeability Soil			
3	Geosynthetic Clay Liner (Internal)	Saturated		

Notes:

1. Large-displacement shear strength results shall be reviewed by the geotechnical engineer of record for compliance with the project requirements. Based on this review, lower shear strengths may be acceptable if analysis using the actual data indicate the interim waste fill will meet applicable Title 27 CCR stability requirements that are described in the Cell 7 Stability Report.
2. Submerged condition shall be maintained during shearing.

2.3 Extrudate Rod or Bead

A. General

1. The extrudate rod or bead shall be high-density polyethylene (HDPE) and shall be of the same formulation and same supplier as the resin used to produce the geomembrane. All additives shall be thoroughly dispersed throughout the extrudate rod or bead. There shall be no contamination by foreign matter in the extrudate rod or bead.

B. Physical Properties

1. The extrudate rod or bead shall meet the following specifications:

Test	Test Method	Units	Requirement
Density	ASTM D-1505	g/cc	0.940 (minimum)
Carbon Black Content	ASTM D-4218	%	2 to 3
Melt Flow Index	ASTM D-1238, Condition E	g/10 min	>1.0
ASTM - ASTM International			

C. Manufacturer Certification and Testing

1. One set of tests shall be performed per batch of extrudate rod or bead. Certified test results shall be submitted to and approved by the CQA Consultant and/or Engineer at least fifteen (15) working days prior to shipping the extrudate rod or bead to the site.

3.0 EXECUTION

3.1 Shipping, Handling, and Storage

A. General

1. Geomembrane shall be shipped, stored, and handled in accordance with the manufacturer's recommendations and as specified herein. The Contractor shall be completely responsible for shipping, handling, and storage of all geomembrane. The geomembrane rolls shall be delivered to the site only after the CQA Consultant and/or Engineer receives and approves, in writing, the submittal information required in these Technical Specifications.

B. Shipping

1. The Contractor shall notify CQA Consultant, Engineer, and Owner at least twenty-four (24) hours prior to scheduled delivery of materials on site. All deliveries shall be made

during normal working hours, Monday through Friday, unless specifically authorized by the Owner. Geomembrane delivered to the site shall be inspected for damage and unloaded and stored with minimal handling.

2. Subsequent to delivery, the CQA Consultant shall complete a surface observation of all rolls for defects or damage. Damaged rolls shall be separated from undamaged rolls until proper disposition of material is determined by CQA Consultant or the Engineer. The CQA Consultant will be the final authority on the determination of damage.

C. Handling

1. No hooks, tongs, or other sharp tools or instruments shall be used for handling geomembrane. Contractor shall use cloth chokers and spreader bars for loading and unloading and spreader bars and roll bars for deployment. Geomembrane shall not be folded or dragged along the ground.

D. Storage

1. Geomembrane shall be protected from soil, mud, dirt, debris, puncture, cutting, or other damaging or deleterious conditions. Geomembrane rolls shall not be stored on wooden pallets. Geomembrane shall not be stacked more than three (3) rolls high. Storage shall be in accordance with the manufacturer's recommendations.

3.2 Supporting Surface

A. Acceptance of Supporting Surface

1. No geomembrane shall be installed until the underlying surface or geosynthetic has been inspected and approved for geomembrane installation by the CQA Consultant. The Contractor shall correct all deficiencies found in the subgrade/underlying geosynthetics prior to deployment of the geomembrane at no additional cost to the Owner. In addition, the geomembrane installer shall inspect the subgrade and shall certify, in writing, that the subgrade is acceptable for geomembrane installation. The Contractor shall maintain responsibility for subgrade maintenance in accordance with the Specification requirements until completion of the liner installation.

B. Maintenance

1. The Contractor shall maintain the suitability and integrity of the GCL until installation of the geomembrane is completed and accepted by the CQA Consultant. The subgrade shall be maintained in a condition that minimizes desiccation and provides for a firm and unyielding condition. Water conditioning or placement of tarps shall be employed to prevent drying of the subgrade and/or saturation due to precipitation. Maintenance of the subgrade shall include non-work hours and weekends as required by weather conditions.

3.3 Geomembrane Installation

A. Installation Submittals

1. The Contractor shall submit the following:
 - a. Installation drawings.
 - b. Description of installation procedures including subgrade maintenance.
 - c. Schedule for performing/completing the work.
2. Installation drawings shall show a field panel lining sheet layout with proposed size, number, position, and placement sequence of all sheets and indicating the location of all field seams and anchors. Installation drawings shall also show complete details and/or methods for anchoring the liner at its perimeter, making field seams and making anchors/seals to pipes and structures penetrating the liner.
3. A field panel (sheet) is an area of geomembrane that is to be seamed in the field (i.e., a field panel is a roll or a portion of roll cut in the field). The geomembrane installer shall assign each panel over 25 square feet an identification code that shall be agreed to and used by the CQA Consultant/Engineer and the Contractor. The Contractor shall

locate the code with roll number near the middle of the panels less than 50 feet in length and at both ends of panels over 50 feet in length.

B. Material Inspection

1. Prior to installation, the Contractor shall visually inspect all geomembrane for imperfections, faulty or suspect areas and possible damage. All such defective geomembrane shall be marked, repaired, and/or tested. Geomembrane that cannot be repaired shall be removed from the work area and replaced at no additional cost to the Owner. Contractor shall inspect and replace faulty material that requires more than one patch per 2,000 square feet of geomembrane deployed at no additional cost to the Owner.

C. General

1. The Contractor shall thoroughly review the manufacturer's recommendations for proper installation procedures of the specified material. The Contractor shall consult with the manufacturer's representatives regarding site specific and environmental impacts that may affect the installation. Such items as adequate or allowable slack, timing of anchor completion to minimize creep, and temperature considerations shall be reviewed, and appropriate action shall be taken by the Contractor to assure intimate contact between subgrade and geomembrane upon placement of overlying material.
2. The number of panels deployed on one day shall be limited to the number of panels that can be seamed or tack welded on the same day.
3. Repair damage to subsurface or GCL prior to deployment of geomembrane. All particles in excess of 0.3-inch projecting diameter shall be removed.
4. Contractor shall use equipment that does not damage geomembrane or the supporting subgrade surface.
5. All personnel working on geomembrane shall wear shoes that do not damage the geomembrane. No personnel shall be allowed to engage in activities that could damage the geomembrane.
6. Clamps and other metal tools used in the work area shall have rounded edges with no sharp corners. Clamps and other metal tools shall not be tossed or thrown.
7. Panels shall be unrolled using a method that protects geomembrane from scratches and crimps and protects the low permeability soil subgrade from damage.
8. Contractor shall minimize wrinkles, especially differential wrinkles between panels.
9. Contractor shall place adequate temporary hold-downs to prevent uplift by wind. Hold-downs shall not damage geomembrane and shall be continuous along edges to minimize risk of wind flow under panels.
10. Contractor shall protect geomembrane in heavy traffic areas using geotextile, extra geomembrane (sacrificial), or other suitable materials. Material used for protection shall be temporary and shall not be used as any part of the permanent installation.
11. Contractor shall not allow vehicle traffic on geomembrane surface.
12. Refer to Section 02205 for specifications related to placement of overlying soils.

D. Weather Conditions

1. Temperature
 - a. Ambient temperature, measured 6 inches above geomembrane surface, shall be logged every 2 hours. Geomembrane shall be deployed between ambient temperatures of 40 degrees F to 105 degrees F and when the relative humidity is less than 80 percent. Deployment of geomembrane below 40 degrees F shall only be allowed after it has been verified that the material can be seamed according to these Technical Specifications, and is approved by the Engineer. When the temperature is below 50 degrees F, preheating by hot air device 1 inch in front of the extruder shall be provided. Special test welds may be required to verify that weather conditions are not adversely impacting seam quality.

2. Precipitation/Moisture
 - a. The geomembrane shall not be deployed during precipitation, in the presence of excessive moisture, or in areas of ponded water. Exceptions to these restrictions may be granted with approval of the CQA Consultant and/or Engineer and on condition that adequate steps (such as shelters) are taken by the Contractor to produce high quality seams meeting the requirements of this Section.
3. Wind Protection
 - a. The geomembrane shall not be deployed in the presence of excessive winds. The Contractor shall protect the geomembrane against adverse effects of high winds (such as uplift). Sandbags may be used for this purpose. Sandbags shall be sufficiently close knit to preclude fines from working free of the bottom, sides, or seams. Paper bags, whether or not lined with plastic, shall not be permitted. Burlap bags, if used, shall be lined with plastic. Sandbags shall contain not less than 40, nor more than 60, pounds of sand having 100 percent passing a #8 screen. Sandbags shall be tied closed after filling, using only plastic ties. Metal or wire ties shall not be allowed. Sandbags that are split, torn, or otherwise losing their contents shall be immediately removed from the work area and replaced and any spills immediately cleaned up.
- E. Miscellaneous Liner Details
 1. Installation of the liner system includes construction of various terminations, anchors, and other appurtenances as indicated on the Plans. All work associated with, and required for, the completion of these items is to be considered as included in the Contractor's lump sum price.

3.4 Seams

- A. General
 1. Seams shall be oriented vertically up and down the slopes; not horizontally across the slopes. No horizontal seams shall be allowed on slopes. For the purposes of these Specifications, benches are included as part of the slope.
 2. Each seam shall be numbered and seam numbering system compatible with the panel numbering system shall be used. The number of field seams in corners, off-shaped geometric locations, and outside corners shall be minimized.
 3. Panels shall be overlapped as recommended by the manufacturer or as indicated on the Plans. Only procedures that do not damage the geomembrane and that are not detrimental to seam weld material shall be used to temporarily bond adjacent panels together.
 4. All edges, laps, junctions, and all tie-ins to existing liner systems shall be welded, whether or not a specific note or detail on the drawings indicates a weld.
- B. Physical Properties
 1. Geomembrane seams shall be tested in accordance with ASTM D-6392 and shall meet or exceed the following minimum requirements:

Test	Test Method	Requirement 60-mil Geomembrane	Requirement 30-mil Geomembrane
<u>Hot Wedge Seams</u>			
Shear Strength (ppi)	ASTM D6392	120	57
Shear Elongation (%)		50	50
Peel strength (ppi)		91	45
Peel Separation (%)		25	25
<u>Extrusion Fillet Seams</u>			
Shear Strength (lb/in)	ASTM D6392	120	57
Shear Elongation (%)		50	50
Peel strength (lb/in)		78	39
Peel Separation (%)		25	25

C. Seam Preparation

1. The following steps shall be followed in preparing seams:
 - a. Clean surface of grease, moisture, dust, dirt, debris or other foreign material.
 - b. Clean surface of oxidation by disc grinder or equivalent not more than 1 hour before seaming (not required for wedge welding).
 - c. Use No. 80 grit sandpaper for disc grinder.
 - d. All areas where grinding is evident shall be repaired with a method approved by the Engineer.
 - e. Cover with single extrudate any bead grooves.
 - f. Use soft bristle brush after grinding, if brushing required.
 - g. Do not use wire brush after grinding.
 - h. Cut wrinkles and "fish-mouths" along ridge.
 - i. Overlap and seam wrinkles and fish-mouths.
 - j. Patch wrinkles and fish-mouths where overlap is less than three (3) inches.
 - k. Use firm, dry substrate (piece of geomembrane or other material) directly under seam overlap where subgrade is soft.
 - l. Use plywood or other firm material under seam overlap when welding over anchor trench.

D. Extrusion Welding

1. As necessary, welding apparatus shall be purged of heat-degraded extrudate before welding if extruder is stopped for longer than 3 minutes. All purged extrudate shall be disposed of off the geomembrane. Extrudate rod shall be removed from welder when welder is idle for over 2 hours.
2. Each extruder shoe shall be inspected daily for wear to ensure that its offset is the same as the liner thickness. Worn shoes, damaged or misaligned armature brushes, nozzle contamination, or other worn or damaged parts shall be repaired or replaced prior to further usage.
3. Stop-start welding shall be avoided. Existing welds or welds more than 5 minutes old shall be ground 2 inches back from point of stoppage or 2 inches on each side of identified leaks before welding. Weld shall be restarted 2 inches on each side of identified leaks or 2 inches back from point of stoppage.
4. No equipment will be allowed to commence welding on liner until the trial weld, made by that equipment, has been approved by the Engineer.
5. Components shall be mounted on a mobile unit for interface extrudate welding. The following accessories shall be included as a minimum:
 - a. Variable speed control.
 - b. Wheels with non-skid surface on HDPE.
 - c. Directional control.

- d. Automatic hot air system for preheating welding surfaces.
 - e. Extruder system with appropriate die.
 - f. Four adjustable contact pressure rollers.
- 6. The "hot air system" shall be tested and set up using scrap material each day prior to commencing seaming. Hot air velocity shall be adjusted to account for wind effects. Contact pressure rollers shall be adjusted to prevent surface ripples in sheet.
- E. Hot Wedge Welding
 - 1. Welding apparatus shall be an automated vehicular mounted device equipped with gauges giving applicable temperatures. The welding apparatus shall be equipped with a temperature gauge.
 - 2. A smooth insulating plate or fabric shall be placed beneath to hold welding apparatus after usage. Protective fabric or piece of geomembrane shall be placed beneath hot welding apparatus when resting on geomembrane.
 - 3. Moisture build up between sheets shall be prevented.
 - 4. No equipment will be allowed to commence welding on liner until the trial seam, made by that equipment, has been approved by the Engineer. All welding conducted at the Contractor's discretion, prior to trial seam results, shall be at the Contractor's risk. Trial seam failures shall be tracked as outlined under "Trial Seams".
 - 5. A minimum of one spare operable welding apparatus shall be maintained for each three seaming teams.
 - 6. An electric generator shall be provided that is capable of providing a constant voltage for the anticipated combined line load. The electric generator shall generally be located outside the liner limit. Protective lining and splash pads large enough to catch spilled fuel shall be placed under electric generator when located on the liner.
- F. Trial Seams
 - 1. Trial seams shall be demonstrated on pieces of geomembrane liner to verify adequate seaming conditions. Trial seams shall be conducted on each piece of equipment in service, at the following frequency:
 - a. At beginning of each seaming shift (5 hours maximum start of day and mid-day).
 - b. Any time a piece of equipment is shut down for more than 30 minutes.
 - c. At least one per shift for each welding technician performing seaming.
 - d. As weather conditions dictate, and at CQA Monitor and/or Engineer's request.
 - 2. Welding technicians shall not change parameters (temperature, speed, wheel adjustment) without successfully performing another trial weld.
 - 3. Trial weld shall be constructed adjacent to the area to be seamed. Trial welds shall be in contact with subgrade or geotextile (same condition as the liner to be seamed).
 - 4. The trial weld sample shall be at least 3-feet long and 12-inches wide with the seam centered lengthwise. Two 1-inch wide specimens shall be cut by the Contractor in the presence of the CQA Monitor and/or Engineer and the specimens obtained near each opposite end of trial weld seam. Specimens shall be quantitatively tested first, for peel adhesion, and then for bonded seam strength (shear).
 - 5. Seam breaks will be analyzed for shear and peel strength in accordance with the requirements of GRI Test Method GM19 Table 1(a). A trial weld passes when both test specimens pass peel and shear tests.
 - 6. Testing shall be repeated in it's entirely if one or more of the specimens fails the peel or shear tests. If trial weld testing fails, the seaming apparatus and operator shall not be used for welding until deficiencies or conditions are corrected and two consecutive successful field test seams are achieved (two specimens in peel and two specimens in shear). All weld seams made by seaming apparatus prior to failure of trial weld shall be checked. Starting back from last seam made, check seams at minimum 10-foot

intervals until two consecutive seam tests pass. Seam shall be reconstructed to the satisfaction of the CQA Monitor and/or Engineer.

G. Repairs

1. Holes smaller than 1/4-inch shall be repaired by extrusion welding. The surface of the geomembrane shall be ground to a minimum 1 inch around hole immediately before welding. Seams shall be vacuum tested after each welding. Result of test, date of test, and name of quality control technician shall be marked on the geomembrane adjacent to the seam.
2. Holes larger than 1/4-inch, tears, blisters, undispersed raw material, and contamination by foreign matter shall be patched. Patches shall be round or oval in shape and made of the same material as the geomembrane. Patches shall extend a minimum of 6 inches beyond the edge of defect and shall be a minimum of 12 inches in diameter. Edge of the patch shall be beveled. Patch shall not be cut with repair sheet in contact with geomembrane. Patch shall be welded to the geomembrane with an approved method and vacuum tested. Result of test, date of test, and name of quality control technician shall be marked on the patch.
3. Contractor's daily documentation of non-destructive testing shall be provided to the CQA Consultant and/or Engineer's on-site representative. The documentation shall identify seams that were repaired and retested successfully.

3.5 Construction Quality Control (QC)

A. General.

1. Contractor shall designate a full-time Quality Control (QC) Technician to be responsible for supervising and/or conducting the construction QC program. The QC Technician shall have quality control experience on a minimum of five million square feet of HDPE geomembrane. The QC Technician shall not be replaced without written authorization by the Owner

B. Visual Inspection

1. All seams shall be visually evaluated by the Contractor as the installation progresses and again at completion of the installation. Defective and questionable sections shall be clearly marked and repaired as necessary.

C. Vacuum Box Testing

1. The continuity of extruded field seams, beads, and patches shall be tested over their entire length using vacuum box test units. The vacuum test shall be performed concurrently with seaming work, not at completion of seaming.
2. The vacuum box shall be an American Vacuum Seam Tester, Series A100 as manufactured by American Parts and Service Company, Alhambra, California, or an approved equal. The vacuum box assembly shall consist of the following:
 - a. Rigid housing.
 - b. Transparent viewing window.
 - c. Soft rubber gasket attached to bottom of housing.
 - d. Porthole or valve assembly.
 - e. Vacuum gage.
3. A vacuum pump and tank equipped with pressure controller and pipe connections, rubber pressure/vacuum hose with fittings and connections, clean, dry, soft rags, plastic bucket and applicator, water, and detergent to produce soapy solution shall also be provided.
4. The vacuum testing procedure shall be as follows:
 - a. Clean window, gasket surfaces, and check for leaks.
 - b. Energize vacuum pump and reduce tank pressure to approximately 5 psi.

- c. Wet a strip of geomembrane weld approximately 12-inches by 30-inches (length of box) with soapy solution.
 - d. Place box over wetted area and compress.
 - e. Close bleed valve and open vacuum valve.
 - f. Ensure that a leak-tight seal is created.
 - g. For a period of not less than 15 seconds, examine length of weld through viewing window for presence of soap bubbles.
 - h. If no bubbles appear after 15 seconds, close vacuum valve and open bleed valve, move box over next adjoining area with minimum 3-inch overlap of previous test section and repeat process.
 - i. Areas where soap bubbles appear shall be marked, repaired, and retested.
5. The following procedures shall be used at locations where seams cannot be vacuum tested:
- a. Where possible and/or required, cap-strip seams with same geomembrane.
 - b. If seam is accessible to testing equipment prior to final installation, vacuum test seam prior to final installation.
 - c. Seaming and cap-stripping operations shall be observed by the CQA Monitor and/or Engineer for uniformity and completeness.
- D. Air Pressure Testing
- 1. The Contractor shall test all dual-hot wedge seams in the HDPE lining by using the air pressure test that consists of inserting a needle with gauge in the air space between welds. Air shall be pumped to 35 psi within the weld void and held for at least 5 minutes. If the pressure loss exceeds 2 psi within the weld void during air pressure testing, the outside weld edge (not free edge) shall be sprayed with a soap solution and visually examined for bubbles. If no bubbles appear, the problem is with the inside weld and the seam is acceptable. If any bubbles appear, the defect shall be repaired by extrusion welding and tested by vacuum box and/or spark detector.
 - 2. If pressure loss is not more than 2 psi, the opposite end of the seam will be punctured to release the air. If a blockage is present, it will be located and tests on both sides of the blockage will be completed. All penetration holes created during testing shall be sealed by patching and extrusion welding.
 - 3. Equipment shall be as follows:
 - a. Air pumps equipped with pressure gauge capable of generating and sustaining a pressure at 35 psi and mounted on cushion to protect geomembrane.
 - b. Rubber hose with fittings and connections.
 - c. Sharp hollow needle or other pressure feed device approved by the Engineer.
 - 4. The air pressure testing shall be as follows:
 - a. Seal both ends of the seam to be tested.
 - b. Insert a needle or other approved pressure feed device into tunnel created by double hot wedge seaming and insert a protective cushion beneath air pump above geomembrane.
 - c. Pressurize air chamber to 40 psi, and sustain pressure for a minimum of 5 minutes.
 - d. Demonstrate air test seam continuity by puncturing end opposite pressure-feed device.
 - e. If loss of pressure exceeds 2 psi or does not stabilize, locate faulty area and repair as appropriate.
 - f. Retest failed areas as appropriate.
 - g. Remove approved pressure feed device and patch.
- E. Spark Testing

1. If a fillet weld is used to weld seams, the Contractor may, in lieu of vacuum box testing, test seams and repairs in the geomembrane by using a high voltage spark detector, similar to Tinker and Razor Holiday Detector (Model AP-W). The setting of the detector shall be 20,000 volts. All seams to be tested shall be provided with 24-30 gauge copper wires properly embedded in the seams and grounded. All spark testing shall be done in the presence of the CQA Monitor and/or Engineer. All defective areas shall be marked for repair.
- F. Final Seam Inspection
1. For final seaming inspection, seams and surface of geomembrane shall be checked for defects, holes, blisters, undispersed raw materials and signs of contamination by foreign matter. The geomembrane surface shall be brushed, blown, and/or washed if dirt inhibits inspection. CQA shall decide if cleaning of geomembrane surface and welds is needed to facilitate inspection. The Contractor shall distinctively mark, preferably with paint, repair areas and indicate required type of repair.

3.6 Construction Quality Assurance Testing

- A. Conformance and destructive seam testing will be conducted by an independent testing laboratory certified by the GAI. Test results of the independent testing laboratory will be considered final. All costs associated with conformance and destructive seam testing sampling, shipping, and testing by the independent testing laboratory will be borne by the CQA Consultant.

3.6.1 Conformance Sampling, Testing and Reporting

- A. The GAI lab shall obtain all conformance samples directly from the manufacturing plant. Conformance samples shall be taken and tested at a rate of one per lot, or one per 100,000 square feet, whichever results in the greater number of tests. Interface shear strength testing shall be conducted at the rate specified in Table 02771-3.
- B. Samples shall be taken across the entire width of the roll and shall not include the first three (3) feet. Unless otherwise specified, samples shall be 3 feet long by the roll width. The CQA Monitor and/or Engineer shall mark the machine direction on the samples with an arrow, and the geomembrane manufacturer's roll identification number.
- C. At a minimum, conformance tests will include determination of the following characteristics for the HDPE:
1. Thickness (ASTM D5994)
 2. Tensile characteristics (yield strength, elongation at yield, break strength, elongation at break) (ASTM D6693 Type IV)
 3. Puncture resistance (ASTM D4833).
 4. Tear Resistance (ASTM D1004)
 5. Density (ASTM D1505/D792)
 6. Carbon black content (ASTM D4218)
 7. Carbon Black Dispersion (ASTM D5596)
 8. Asperity Height (ASTM D7466)
 9. Interface shear (ASTM D5321)
- *Where optional procedures are noted in the test method, the requirements of the Project Specifications shall prevail.
- D. A conformance sample that yields any tested property less than the specified average minimum roll property will be recorded as a failure. The portion of the manufactured lot represented by the failing conformance sample/test will be considered non-conformant with the Project Specifications and the material rejected for use on the project.
- E. The minimum number of specimens tested will be determined in accordance with ASTM Standards. Certified test results of the independent laboratory shall be submitted for approval by the CQA Consultant and/or Engineer following the requirements set forth in

these Specifications. Final approval of the geomembrane shall be contingent upon certification of test results that meet or exceed the requirements of these Technical Specifications.

3.6.2 Destructive Seam Testing

- A. The Contractor shall visually inspect, mark and repair suspicious-looking welds before release of a section to the CQA Monitor and/or Engineer for destructive seam testing. The Contractor shall provide the CQA Monitor with a minimum of one destructive sample per 500 linear feet of seam length for destructive seam testing. Destructive seam testing will be performed by the GAI certified, independent testing laboratory, and all testing costs will be paid by the Contractor. The section shall be selected by the CQA Monitor and the Contractor shall not be informed in advance of the sample location. Samples shall be cut as seaming and non-destructive testing progresses and prior to completion of liner installation. Samples shall be marked with consecutive number and location seam number. Contractor shall record, in written form, the date, time, location, seam number corresponding roll number, welding apparatus identification number, and ambient temperatures at time seam was welded. This information shall be delivered to the Engineer with the destructive samples. The CQA Monitor and/or Engineer shall observe acquisition of all destructive samples. The Contractor shall immediately repair holes in geomembrane resulting from obtaining destructive samples and vacuum test patches.
- B. The size of destructive samples shall be as follows:
 - 1. Two 1-inch wide by 12-inch long (plus seam width) for field testing
 - 2. One 12-inch wide by 36-inch long for laboratory testing
- C. The sample shall be cut into three equal parts and distributed as follows:
 - 1. Independent Lab
 - 2. Contractor
 - 3. Engineer (Archive)
- D. The destructive seam testing will be as follows. The two 1-inch wide samples shall be tested in the field for peel adhesion and bonded seam strength (shear) by the Contractor and shall pass the strength requirements established in Section 3.4.2. If one or both of the samples fails in either peel or shear, the Contractor can, at his/her discretion, either: (1) reconstruct or cap strip the seam between passed test locations or, (2) take another test sample 10 feet from the point of the failed test and repeat this procedure.
- E. If the second test passes, the Contractor shall reconstruct or cap strip the seam between the two passed test locations.
- F. If subsequent tests fail, the procedure is repeated until the length of the poor quality seam is established. Repeated failures indicate that either the seaming equipment and/or operator is not performing properly, and appropriate action shall be taken.
- G. Once the field tests have passed, the lab sample shall be recovered from between passing field sample locations for testing by the independent testing laboratory.
- H. All specimens of a field weld sample tested by the independent testing laboratory shall pass. If any specimen fails, the entire sample shall be considered as a failure and the field weld shall be rejected. In this event, the field seam(s) shall be rejected as being nonconformant with the Technical Specifications and corrective measures shall be implemented.
- I. For destructive samples that have failed, corrective measures shall include a rerun of the weld test using the same sample. If the second test passes, the CQA Monitor and/or Engineer may assume an error was made in the first test and the field seam may be accepted. If the second test fails, the Contractor shall reconstruct or cap strip the field seam between any two previous passed seam locations that include the failed seam or

- shall go on both sides of the failed seam location (10-feet minimum), take another sample each side and test both in the independent laboratory.
- J. If both samples pass, the Contractor shall reconstruct or cap strip the field seam between the two passing locations. If either fails, the Contractor shall repeat the process of taking samples for testing by the independent testing laboratory. In all cases, acceptable field seams must be bounded by two passed test locations. In cases involving more than 50 feet of reconstructed or cap stripped seam, the reconstructed or cap stripped seam shall also be tested. The results of the independent testing laboratory governs seam acceptance. In no case shall field testing of installed seams be used for final acceptance.
 - K. Testing shall include peel and shear strength (ASTM D-6392). At least five specimens each shall be tested for peel and shear. Minimum test values are presented in section 3.4 of these Technical Specifications.
 - L. The Contractor's laboratory test results shall be presented to the CQA Consultant and Engineer for comments.

3.7 As-Built Drawing

- A. In addition to providing survey data from which final pay quantities shall be verified, the Contractor shall submit information required in the preparation of the record drawings for the containment system. This data shall include sub drain/LCRS locations and elevations, LCRS gravel surface area, anchor trenches, termination locations, destructive seam test locations, protective cover layer limits, and other such information to accurately document the as-constructed condition of all elements of the composite liner installation.
- B. The survey and record drawing requirements for this project may necessitate that the Contractor be prepared to perform survey work on a daily basis during the liner installation phase of the work to accurately document the as-built condition of the various components of the system.

4.0 MEASUREMENT AND PAYMENT

NOT USED

END OF SECTION 02771

SECTION 02772 GEOTEXTILES

1.0 GENERAL

1.1 Summary

- A. This section describes the general requirements for the manufacture, supply, installation, and quality control (QC) of geotextiles.
- B. Nonwoven geotextile installation described within this specification will be performed by a Geosynthetics Installer. Coordination of the work with other portions of the work described in other specifications, installation of minor amounts of geosynthetics related to the subdrain trench (that doesn't require sewing), and processing submittals and overall responsibility for the work will be the responsibility of the General Contractor.
- C. The Owner will pay the Geosynthetics Installer directly for this project. Direct Payment will be the only responsibility of the Owner with regard to the work. The Geosynthetics Installer shall be responsible for coordinating shipping of the liner materials to the site and including that cost in their unit prices. The Owner will pay for the shipping directly. The General Contractor will be responsible for all coordination, superintendence, quality control, routing of submittals, scheduling, and otherwise interact with the Geosynthetics Installer as is typical for a landfill liner-installation project.
- D. The nonwoven geotextile materials will be sole sourced for this project unless they are not readily available from the sole source provider described herein. Direct payment for the sheet goods, shipping, and related sales tax will be the only responsibility of the Owner with respect to the geotextile materials. The General Contractor will be responsible for coordination, superintendence, quality control, routing of submittals, scheduling, and otherwise interact with the geosynthetics manufacturer and Geosynthetics Installer as is typical for a landfill liner installation project. The Geosynthetics Installer will be responsible for coordinating with Owner and General Contractor to ensure that adequate materials are ordered to account for lap and scrap, process submittals, provide their own quality control, and install the geosynthetics as is typically done on a liner project.

1.2 Quality Control (QC) Testing

- A. Quality Control (QC) is the responsibility of the Contractor and shall consist of manufacturer's certification, manufacturer's quality control testing, installation quality control, conformance testing including direct shear testing for interface shear strength, and destructive seam testing. All QC sampling and testing shall be performed in accordance with these Specifications and all costs associated with quality control, conformance, and destructive seam testing shall be borne by the Contractor. The Contractor shall submit, for approval by the Engineer, a breakdown of costs for the specified testing.

1.3 Qualifications

- A. The Contractor shall be experienced in the installation of geotextiles. In the event the Contractor is not experienced, a representative of the geotextile manufacturer shall be on-site to train the Contractor, at no additional cost to the Owner.

1.4 Submittals

- A. Manufacturing Quality Control Certificates
 - 1. A copy of the manufacturer's quality control program shall be submitted to the Construction Manager a minimum of seven (7) calendar days prior to geotextile shipment to the site. Quality control testing shall be performed by the manufacturer in accordance

with the specifications and as approved by the CQA Consultant. Prior to delivery, the following shall be submitted to the CQA Consultant and Engineer for review:

- a. Copies of quality control certificates issued by the manufacturer. The quality control certificates shall include:
 - i. Roll numbers and identification
 - ii. Sampling procedures
 - iii. Results of quality control tests verifying that each of the properties listed in Table 02772-1 is met. The manufacturer quality control tests to be performed include the tests specified in Section 2.3 of this specification.
 - iv. Certificate stating the name of the manufacturer, product name, style number, chemical composition of the filaments or yarns, and other pertinent information to fully describe the geotextile.
 - v. Certificate stating that the finished geotextile meets MARV or MaxARV requirements of the specification as evaluated under the manufacturer's quality control program. A person having legal authority to bind the manufacturer shall attest to the certificate.
 - vi. Either mislabeling or misrepresentation of materials shall be reason to reject those geotextile products.
- b. Conformance Testing Results
- c. Installer Qualifications

2.0 PRODUCTS

2.1 Materials

- A. The geotextiles shall conform to Table 02772-1.
- B. Geotextile cushions and filters shall be non-woven, needle-punched polyester or polypropylene fabric free from needles or other foreign material.
- C. Workmanship and Appearance
 1. The finished geotextile shall have good appearance qualities. It shall be free from such defects that would affect the specific properties of the geotextile, or its proper functioning.
 2. General manufacturing procedures shall be performed in accordance with the manufacturer's internal quality control guide and/or documents.

2.2 Delivery, Storage, and Handling

- A. Each geotextile roll shall be wrapped with a material that will protect the geotextile, including the ends of the roll, from damage due to shipment, water, sunlight, and contaminants. The protective wrapping shall be maintained during periods of shipment and storage.
- B. Geotextile labeling, shipment, and storage shall follow ASTM D4873.
- C. Handling, storage, and care of the geotextile following transportation to the site shall be the responsibility of the Contractor. The Contractor shall be liable for all damage to the materials incurred prior to final acceptance of the liner system by the CQA Consultant.
- D. Conform to the manufacturer's requirements to prevent damage to geotextile.
- E. Delivery
 1. Deliver materials to the site only after the CQA Consultant and the Owner approves required submittals.
 2. Geotextile rolls delivered to the project site shall be only those indicated on Geotextile manufacturing quality control certificates.

3. All rolls of geotextile delivered to the site shall be labeled at the factory with the following:
 - a. Manufacturer's name
 - b. Product identification and thickness
 - c. Roll number
 4. Separate rolls without proper documentation and store until the CQA Consultant approval is received.
 5. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.
- F. Storage
1. The Contractor shall be responsible for storage of the geotextile at the site after the material is delivered. The geotextile shall be stored off the ground and out of direct sunlight, and shall be protected from mud, dirt, dust, and any additional storage procedures required by the Geotextile manufacturer.
 2. During storage, geotextile rolls shall be elevated off the ground and adequately covered to protect them from the following: site construction damage, precipitation, extended ultraviolet radiation including sunlight, chemicals that are strong acids or strong bases, flames including welding sparks, temperatures in excess of 160 degrees Fahrenheit (71 degrees Celsius), and any other environmental condition that may damage the property values of the geotextile.
- G. Handling
1. Precautions shall be taken to prevent damage to underlying materials during placement of the geotextile.
 2. After unwrapping the geotextile from its cover, the geotextile shall not be left exposed for a period in excess of 15 days.
 3. The Contractor is responsible for storage, and transporting material from storage area to liner facility.
- H. Damaged Geotextile
1. Each roll shall be visually inspected when unloaded to determine if any packaging or material has been damaged during transit.
 2. Geotextile damage will be documented by the CQA Consultant.
 3. Damaged geotextile shall be repaired, if possible, in accordance with these specifications or shall be replaced at no additional cost to the Owner.
 4. Separate damaged rolls from undamaged rolls and store at locations designated by the Owner until proper disposition of material is determined by the CQA Consultant.
 5. The Owner will be the final authority regarding damage.

2.3 Source Quality Control

- A. Conformance Testing
1. The Contractor shall obtain all conformance samples directly from the manufacturing plant, under the observation of the CQA Consultant, or as approved by the Engineer. The Contractor will obtain one conformance sample at a frequency of one per 100,000 square feet or per lot, whichever results in the greater number of samples. Test specimens will be obtained from each conformance sample. The minimum number of specimens tested per conformance sample for each tested geotextile property will be determined in accordance with ASTM D4759. The samples will be forwarded to an independent testing laboratory for the conformance tests listed in Table 02772-1.

2. The average value will be calculated from the specimen test values of each conformance sample and compared to the minimum average roll value of the tested geotextile property.
 3. A conformance sample that yields any tested property less than the specified average minimum roll property will be recorded as a failure and all geotextile rolls in that lot represented by that conformance sample will be rejected for use on the project. At the Contractor's option, additional conformance samples representing that lot may be tested to evaluate the physical properties of other rolls within the lot and to isolate the nonconforming materials. If only one conformance test fails, the roll that yielded the failure will be rejected and subsequent conformance samples from the same 100,000 square feet or lot will be obtained. If subsequent conformance samples fail the entire lot or 100,000 square feet represented by the test will be rejected for use on the project. If subsequent conformance tests pass, only the rolls which yielded a failure will be rejected for use on the project.
 4. The minimum number of specimens tested will be determined in accordance with ASTM standards. Certified test results of the independent laboratory shall be submitted for approval by the CQA Consultant following the requirement set forth in these specifications. Final approval of the geotextile shall be contingent upon certification of test results which meet or exceed the requirements of these specifications.
- B. MQC Sampling, Testing, and Acceptance
1. Geotextiles shall be subject to sampling and testing to verify conformance with this specification. Sampling shall be in accordance with the most current modification of ASTM D4354, using the section titled, "Procedure for Sampling for Purchaser's Specification Conformance testing." In the absence of purchaser's testing, verification may be based on manufacturer's certifications as result of testing by the manufacture quality assurance samples obtained using the procedure for Sampling the Manufacturer's Quality Assurance (MQA) Testing. A lot size shall be considered to be the shipment quantity of the given product or a truckload of the given product, whichever is smaller.
 2. Testing shall be performed in accordance with the method referenced in this specification for the indicated application. The number of specimens to test per sample is specified by each test method. Geotextile product acceptance shall be based on ASTM D4759. Product acceptance is determined by comparing the average test results of all specimens within a given sample to the specification MARV. Refer to ASTM D4759 for more details regarding geotextile acceptance procedures.
- C. MQC Retest and Rejection
1. If the results of any test do not conform to the requirements of this specification, retesting to determine conformance or rejection should be done in accordance with the manufacturing protocol set forth in the manufacturer's quality manual.
- D. Plant Inspection
1. A representative of the Owner, CQA Consultant, or Engineer may visit the manufacturing plant at any time during the project to observe and inspect the manufacturing process and quality control monitoring, sampling and testing. The Contractor shall notify the CQA Consultant and/or Engineer at least five (5) working days prior to the start of manufacturing. The Engineer will notify the Contractor at least 48 hours in advance of all visits. The Contractor shall be responsible for making all necessary arrangements for the visits with the manufacturer. All costs of travel, lodging and meals incurred by the Owner, CQA Consultant, or Engineer will be borne by the respective party. The purpose of the manufacturing plant inspection will be to observe the manufacturing process and

the quality control procedures instituted at the manufacturing plant and not for monitoring or observing conformance sampling.

2. It is also a requirement of these Project Specifications that conformance sampling will be performed at the manufacturing plant. Costs associated with conformance sampling at the manufacturing plant shall include travel and per diem expenses incurred by the Owner, CQA Consultant, or Engineer in the performance of such testing and all costs for transporting the samples to the independent testing laboratory shall be borne by the contractor.
3. Sampling for conformance testing and interface shear testing shall be performed by GAI accredited independent laboratory under supervision of the CQA Consultant.

2.4 Warranty

- A. The geotextile manufacturer shall furnish a written warranty on a prorata basis for a period of five (5) years. The warranty shall be against manufacturing defects of workmanship and against deterioration due to ozone, ultraviolet and/or other normal weather aging.
- B. The warranty shall be limited to replacement of material only and shall not cover installation of said material. It shall not cover damage due to vandalism, acts of animals, earthquakes, and other unusual acts of God.

3.0 EXECUTION

3.1 Installation

- A. Geotextile seams shall be continuously sewn or heat bonded. Geotextile seams shall be overlapped a minimum of six (6) inches prior to joining. Horizontal seams shall only be allowed on slopes where the seams are located on the lower one third of the slope on alternating panels and shingled downward.
- B. The geotextile shall be installed to the lines and grades as shown on the contract drawings and as described herein.
- C. The geotextile shall be rolled down the slope in such a manner as to continuously keep the geotextile in tension by self-weight. The geotextile shall be securely anchored in an anchor trench where applicable, or by other approved or specified methods.
- D. The geotextile shall be seamed using heat seaming or stitching methods as recommended by the manufacturer and approved by the CQA Consultant. Sewn seams shall be made using polymeric thread with chemical resistance equal to or exceeding that of the geotextile. All sewn seams shall be continuous. Seams shall be oriented down slopes perpendicular to grading contours unless otherwise specified. For heat seaming, fusion welding techniques recommended by the manufacturer shall be used.
- E. Seams for the non-woven geotextile shall be overlapped a minimum six (6) inches and shall be leistered with appropriate leistering equipment. The Contractor can reduce overlap distance if seams are sewn, with approval of the CQA Consultant.

3.2 Protection

- A. The Contractor shall examine the entire geotextile surface after installation to ensure that no potentially harmful foreign objects are present. Such foreign objects shall be removed and damaged geotextile shall be repaired or replaced at no cost to the Owner.
- B. Use care not to damage underlying materials during installation.
- C. Prevent the geotextile from accumulating excessive dust.
- D. The Contractor shall be responsible for field handling, storing, deploying, seaming or connecting, temporary restraining (against wind), anchoring, and other aspects of geotextile

installation. Specifically, the Contractor shall follow the guidelines in ASTM D4873 regarding the placement, handling and storage of geotextiles.

- E. The Contractor shall accept and retain full responsibility for all materials and installation and shall be held responsible for any defects in the completed system.
- F. No equipment shall operate directly on the geotextile.
- G. The geotextile shall be handled in such a manner as to ensure that it is not damaged in any way. Should the Contractor damage the geotextile to the extent that it is no longer usable as determined by these specifications or by the CQA Consultant, the Contractor shall replace the geotextile at his own cost.
- H. In the presence of wind, all geotextiles shall be weighted by sandbags or approved equivalent. Such anchors shall be installed during placement and shall remain in place until replaced with cover material.
- I. The Contractor shall take necessary precautions to prevent damage to adjacent or underlying materials during placement of the geotextile. Should damage to such material occur due to the fault of the Contractor, the latter shall repair the damaged materials at his own cost and to the satisfaction of the CQA Consultant.
- J. During placement of the geotextile, care shall be taken not to entrap soil, stones or excessive moisture that could hamper subsequent seaming of the geotextile as judged by the CQA Consultant.
- K. The geotextile shall not be exposed to precipitation prior to being installed.
- L. The Contractor shall not use heavy equipment to traffic above the geotextile without approved protection.
- M. The geotextile shall be covered as soon as possible after installation and approval. Installed geotextile shall not be left exposed for more than 14 days.
- N. Material overlying the geotextile shall be carefully placed to avoid wrinkling or damage to the geotextile.

3.3 Repairs

- A. Repair holes or tears in geotextiles with a patch from the same geotextile material with a minimum seam overlap of 2-ft in all directions. If tear exceeds 50 percent of the roll width, remove and replace the roll. No patches will be allowed within one (1) inch of a panel edge.
- B. Remove any soil or other material which may have penetrated the torn geotextile.
- C. Notify the CQA Consultant of all repairs.

3.4 Acceptance

- A. The Contractor retains all responsibility for geotextile installation until acceptance by the Owner.
- B. The Owner accepts geotextiles when all the following have been completed:
 - 1. The installation is complete.
 - 2. Tests, if required, verify product requirements.
 - 3. Documentation of installation is complete including the CQA Consultant's final report.
 - 4. Verification of the adequacy of all seams and repairs, including associated testing, is complete.
 - 5. Written certification documents have been received by the CQA Consultant and the Owner.

Table 02772-1
Non-woven Geotextile Properties

Fabric Property	ASTM Test Method	Units	Frequency	Values		
				Filter ⁽¹⁾	Cushion ⁽¹⁾	Cushion ⁽¹⁾
Mass Per Unit Area ⁽⁴⁾	D5261	oz/yd ²	100,000 ft ²	8	12	16
Grab Tensile Strength ⁽⁴⁾	D4632	lbs	100,000 ft ²	220	300	370
Grab Tensile Elongation	D4632	percent	100,000 ft ²	N/A	50	50
Trap Tear Strength	D4533	lbs	100,000 ft ²	90	115	145
CBR Puncture Strength	D6241	lbs	100,000 ft ²	500	800	900
Apparent Opening Size (AOS) (O ₉₅) ^{(2),(4)}	D4751	US Sieve Size	100,000 ft ²	80	N/A	N/A
Permittivity ^{(2),(4)}	D4491	sec ⁻¹	100,000 ft ²	1.2	N/A	N/A
UV Resistance ⁽³⁾	D7238	percent	Per each formulation	70	70	70

Notes:

- (1) All values are minimum average roll values (MARV) except UV resistance which is a minimum average value.
- (2) Applicable only to the geotextile filter.
- (3) Evaluation to be on a 2.0 inch strip tensile specimens after 500 hours exposure.
- (4) Conformance Testing required per Specification 02772, section 2.3(A).

4.0 MEASUREMENT AND PAYMENT

NOT USED

END OF SECTION 02772

APPENDIX H
GEOMEMBRANE COVER OPERATIONS AND MAINTENANCE PLAN,
DATED MAY 9, 2025



May 9, 2025

Mr. Steve Cassulo
Chiquita Canyon Landfill
29201 Henry Mayo Drive
Castaic, CA 91384

**Subject: Compliance Order Milestone 2A-1 (Formerly Mitigation Measure #2A)
Operations and Maintenance Plan, Chiquita Canyon Landfill, Castaic,
California**

Dear Mr. Cassulo,

On behalf of Chiquita Canyon, LLC (Chiquita), Tetra Tech and SCS Engineers hereby submit this Operations and Maintenance Plan for the existing 30-mil High Density Polyethylene (HDPE) geosynthetic cover (also referred to as a geomembrane cover) installed over portions of the reaction area at the Chiquita Canyon Landfill (Landfill), pursuant to Milestone 2A-1 (formerly referred to as Mitigation Measure #2A) of the June 6, 2024 Compliance Order issued by the Los Angeles County Department of Public Health, Solid Waste Management Program, acting as the Local Enforcement Agency (LEA).

Chiquita installed approximately 44.6 acres of geosynthetic cover in accordance with Milestone 2A-1 of the June 6, 2024 Compliance Order as of December 27, 2024. Additionally, as of January 3, 2025, approximately 1.3 acres of geosynthetic cover were installed over the disposal area in accordance with the west toe drain workplan. See **Attachment 1** for approximate limits of geosynthetic cover installed as of January 10, 2025, and **Attachment 2** for the technical data sheet for the geosynthetic cover material.

Chiquita submitted a Final Completion Report for its installation of the geosynthetic cover to the LEA on January 17, 2025.¹ The LEA, in collaboration with the California Department of Resources Recycling and Recovery (CalRecycle), conditionally approved the Final Completion Report on April 9, 2025, contingent on Chiquita submitting an Operations and Maintenance Plan providing the information requested by the LEA. Per the LEA's conditional approval, Tetra Tech and SCS prepared, on behalf of Chiquita, this Operations and Maintenance Plan to ensure the continuous seal around the vertical landfill gas (LFG) wells are in good repair and not compromised and to include a plan to be implemented in the event of geomembrane deterioration and/or damage.

In addition, Chiquita and contractor personnel are implementing the air monitoring and maintenance procedures described in the *Revised Geomembrane Cover Monitoring and Maintenance Plan*, attached as an appendix to Chiquita's *Revised Cover Installation Plan*,

¹ See Final Completion Report of Milestone 2A-1 (Formerly Mitigation Measure #2A), Chiquita Canyon Landfill, Jan. 17, 2025, available at <https://chiquitacanyon.com/odor-mitigation/>.



submitted to the U.S. Environmental Protection Agency (US EPA) in December 2024 pursuant to the Unilateral Administrative Order, EPA Docket No. RCFA 7003-09-2024-0001 and CERCLA 106-09-2024-05, and approved by US EPA in January 2025. This monitoring and maintenance plan can be found on Chiquita's Odor Mitigation website, available at <https://chiquitacanyon.com/odor-mitigation/stipulated-order-for-abatement/>. This O&M plan incorporates this monitoring and maintenance plan by reference.

Vertical LFG Well Seals

Chiquita performs visual inspections of the geosynthetic cover including the LFG well seals, in accordance with Chiquita's April 16, 2024 Second Revised Written Plan for documenting and tracking cover issues (approved by the LEA on May 2, 2024); Milestone 2B of the LEA's June 6, 2024 Compliance Order; and Conditions 30 and 101 of the South Coast Air Quality Management District (SCAQMD)'s Stipulated Order (most recently modified on April 16, 2025). These logs are collected and submitted to the LEA on a weekly basis and to the South Coast AQMD on a monthly basis, and are posted on Chiquita's Odor Mitigation website.

Additionally, every well within the reaction area is monitored and the data collected is evaluated to determine if any atmospheric intrusion is occurring, which might indicate a leak in the area around the well. If the data indicates possible intrusion, additional inspections of the penetration in the area are performed as not all leaks may result in emissions. This additional evaluation enables discovery of non-emissions based liner issues. Repairs performed are noted by repair personnel.

During these routine inspections, if a seal is found to be leaking either through a visual inspection or from audible noise (which can be a result of possible LFG or vacuum leaks), it will be assessed and repairs will be made in accordance with the following:

LFG Well Seal Adjustment:

- Some LFG well seals may need adjustment so that they remain sealed to the well casing while also allowing for movement caused by settlement. LFG well seals may need to be tightened or adjusted downwards so that they properly seal and are positioned to prevent stress to the LFG well seal.

LFG Well Seal Replacement:

- If an LFG well seal is found to have deteriorated or torn due to the conditions in the area or due to stress, it will be repaired in accordance with the geomembrane replacement or repair plan as outlined below.

Geomembrane Replacement

Chiquita performs visual inspections of the geosynthetic cover in accordance with Chiquita's April 16, 2024 Second Revised Written Plan for Documenting and Tracking Cover Issues; Milestone 2B of the LEA's June 6, 2024 Compliance Order; and Conditions 30 and 101 of the South Coast AQMD Stipulated Order (most recently modified on April 16, 2025). Chiquita promptly repairs



any cover issues identified during these inspections. Chiquita maintains a log documenting the results of these inspections and actions taken to repair the damage. These logs are collected and submitted to the LEA on a weekly basis and to the South Coast AQMD on a monthly basis, and are posted on Chiquita's Odor Mitigation website.

Chiquita visually inspects the geosynthetic cover, including connection points, seams, and seals, for deterioration and/or damage. Portions of the geomembrane shall be repaired when they show signs of deterioration and/or damage.

The geomembrane used to replace the deteriorated/damaged geomembrane shall have a minimum nominal thickness of 30 mils and be made of High Density Polyethylene, consistent with the cover material described in the technical data sheet included as Attachment 2.

Repairs to the geosynthetic cover shall be made in accordance with the following:

Temporary Repairs:

- When deteriorated/damaged geomembrane is discovered, it shall be temporarily sealed with flex tape until the permanent repair can be made.

Permanent Repairs:

- Prior to permanent repairs being performed, an organic vapor analyzer will be used to determine emissions levels. Once the permanent repair has been made the geosynthetic cover shall be tested for any methane leaks using the organic vapor analyzer. If the testing results upon completion of the repairs indicate the methane concentration has returned to compliance, the patch will be determined to be complete. If monitoring indicates a leak is still present, additional repairs will be implemented until compliance is achieved.
- Holes or tears smaller than 1/4-inch shall be repaired by extrusion welding. The surface of the geosynthetic cover shall be ground to a minimum 1 inch around hole, cleaned, and dried immediately before welding.
- Holes or tears larger than 1/4-inch shall be patched. Patches shall be round or oval in shape and made of the same material as the geosynthetic cover. Patches shall extend to a minimum of 6 inches beyond the edge of the defect and shall be a minimum of 12 inches in diameter. The edge of the patch shall be beveled. The patch shall not be cut while in contact with the geosynthetic cover. Clean and dry all surfaces at the time of repair. The patch shall be extrusion welded to the geosynthetic cover
- Areas of the geosynthetic cover with large defects where the preceding methods are not appropriate shall be removed and replaced. Replacement geomembrane shall be dual-hot wedge seamed where possible.



Sincerely,

A handwritten signature in black ink, appearing to read 'Julie H'.

Julie Hauenstein, P.E.
Project Manager
Tetra Tech
(909) 835-8167

A handwritten signature in black ink, appearing to read 'Bill Haley'.

Bill Haley, P.E.
Project Director
SCS ENGINEERS
(858) 524-9525

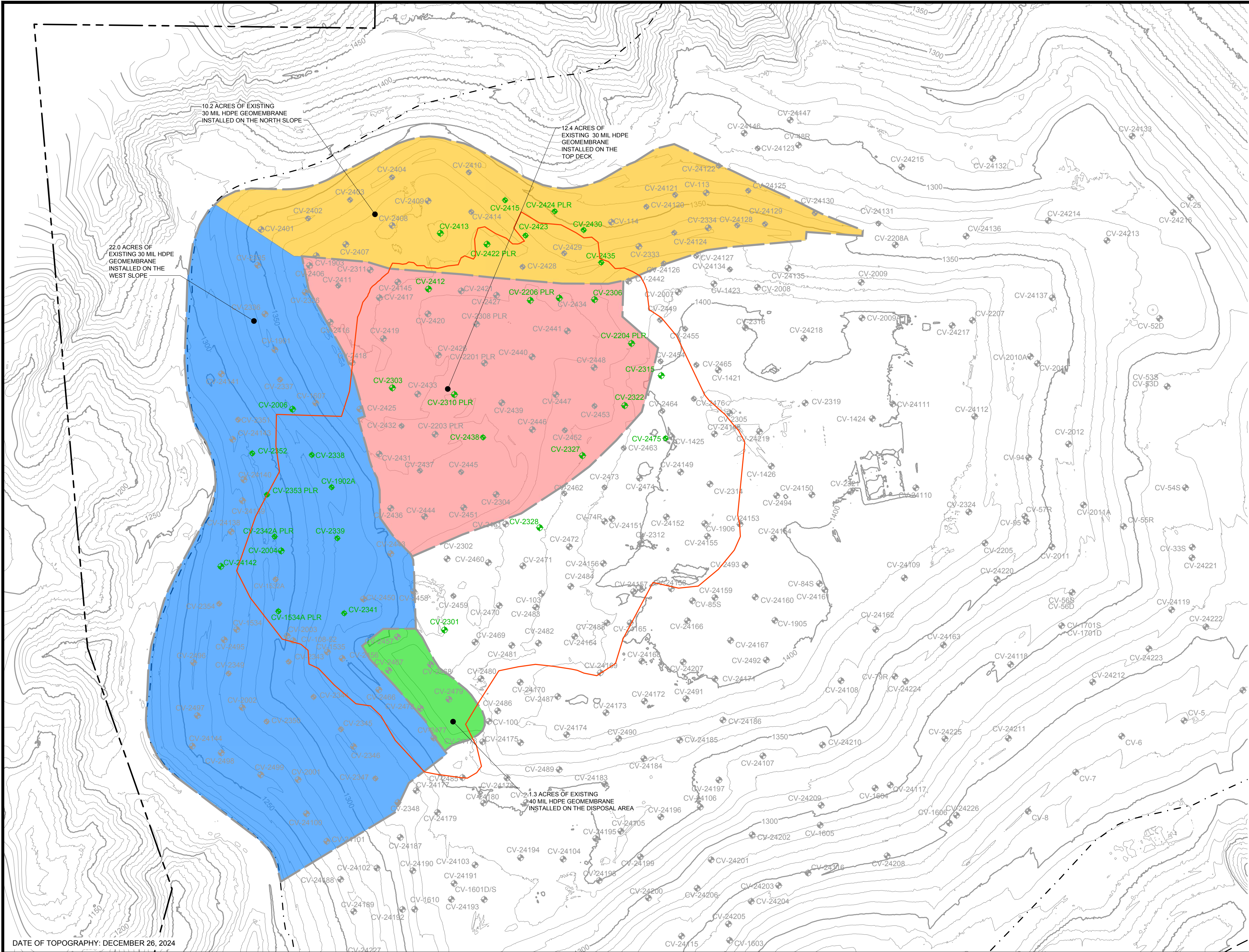
Attachments:

1. Figure illustrating the approximate limits of the Geomembrane Cover installed as of January 10, 2025
2. 30 mil HDPE Geomembrane Technical Data Sheet

cc: John Perkey, Waste Connections
Mark Adams, Waste Connections
Kate Logan, Waste Connections
Nicole Ward, Waste Connections
Amanda Froman, Waste Connections
Robert Ragland, Los Angeles County Department of Public Health
Liza Frias, Los Angeles County Department of Public Health
Nichole Quick, M.D., Los Angeles County Department of Public Health
Shikari Nakagawa-Ota, Los Angeles County Department of Public Health
Ken Habaradas, Los Angeles County Department of Public Health
Karen Gork, LEA
Eric Morofuji, LEA
Renee Jensen, LEA Counsel
Blaine McPhillips, Senior Deputy County Counsel
Emiko Thompson, Los Angeles County Department of Public Works
Alex Garcia, Los Angeles County Department of Regional Planning
Ai-Viet Huynh, Los Angeles County Department of Regional Planning
Wes Mindermann, CalRecycle
Janelle Heinzler, CalRecycle
Todd Thalhamer, CalRecycle
Jeff Lindberg, California Air Resources Board
Jack Cheng, South Coast Air Quality Management District
Larry Israel, South Coast Air Quality Management District
Enrique Casas, Los Angeles Regional Water Quality Control Board
Joel Jones, United States Environmental Protection Agency
Linda Lye, California Environmental Protection Agency

Attachment 1

**Figure illustrating the approximate limits of the Geomembrane Cover
installed as of January 10, 2025**



- NOTES:
- EXISTING LINER LIMITS PER JANUARY 10, 2025 AERIAL PHOTO.
 - LIMIT OF SETTLEMENT AS OF JANUARY 3, 2025.
 - WELLS SHOWING SIGNS OF A REACTION AS OF JANUARY 10, 2025 DATA PER SCS ENGINEERS. A REACTIVE WELL IS A VERTICAL WELL THAT EXHIBITS ALL OF THE FOLLOWING CHARACTERISTICS:
 - LANDFILL GAS (LFG) WELLHEAD TEMPERATURES IN EXCESS OF APPROXIMATELY 160 DEGREES FAHRENHEIT.
 - POOR GAS QUALITY (DEFINED AS METHANE LEVELS OF LESS THAN 30 PERCENT) IN CONJUNCTION WITH METHANE-TO-CARBON DIOXIDE (CH4:CO2) RATIOS LESS THAN 1.0.
 - THE CONCENTRATION OF HYDROGEN (H2) IN THE LFG MEASURED GREATER THAN 2 PERCENT BY VOLUME.

- LEGEND**
- PROPERTY BOUNDARY
 - PERMITTED LIMIT OF REFUSE
 - EXISTING LIMIT OF LINER
 - LIMIT OF SETTLEMENT
 - 2024 MAJOR CONTOUR
 - 2024 MINOR CONTOUR
 - EXISTING VERTICAL WELL
 - EXISTING VERTICAL WELL - PRESSURIZED LEACHATE RELEASE
 - EXISTING VERTICAL WELL - REACTIVE
 - EXISTING HORIZONTAL WELL

DATE OF TOPOGRAPHY: DECEMBER 26, 2024

NO.	REVISION DESCRIPTION	BY:	

TETRA TECH
21700 Copley Drive, Suite 200
Diamond Bar, CA 91765
TEL 909.860.7777 FAX 909.860.8017



CHIUQUITA CANYON LANDFILL			
APPROXIMATE LIMITS OF GEOSYNTHETIC COVER			
DESIGNED BY :	J.M.H	FILE : FIGURE 1 - APPROXIMATE LIMITS OF GEOSYNTHETIC COVER.dwg	
DRAWN BY :	J.S.C	DATE : 01-2025	SCALE: AS SHOWN
CHECKED BY :	A.N.P	DATE : 01-2025	FIGURE 1
APPROVED BY :	J.M.H	DATE : 01-2025	

P:\Waste Connectors\Chiquita\Ode Control\CAD\Sheets\Figures\FIGURE 1 - APPROXIMATE LIMITS OF GEOSYNTHETIC COVER.dwg 1/17/2025 5:43 PM

Attachment 2
30 mil HDPE Geomembrane Technical Data Sheet

PROPERTY ⁽¹⁾	TEST METHOD	FREQUENCY	UNIT Imperial	1084228
SPECIFICATIONS				
Thickness (Nominal ±10%) (11)	ASTM D5994	Every roll	mils	30
Asperity Height (min. avg.)	ASTM D7466	Every roll	mils	16
Resin Density	ASTM D1505	Certified	g/cc	> 0.932
Melt Index - 190°C/2.16 kg (max.)	ASTM D1238	Certified	g/10 min	1.0
Density	ASTM D792	One per batch	g/cm ³	≥ 0.940
Carbon Black Content	ASTM D4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D5596	Every 10 rolls	Category	Cat. 1 & Cat. 2
OIT - Standard (min. avg.)	ASTM D8117	Per formulation	min	100
Tensile Properties (min. avg) (2)	ASTM D6693	Every 5 rolls		
Strength at Yield			lbs/in	63
Elongation at Yield			%	12
Strength at Break			ppi	45
Elongation at Break			%	100
Tear Resistance (min. avg.)	ASTM D1004	Every 10 rolls	lbf	21
Puncture Resistance (min. avg.)	ASTM D4833	Every 10 rolls	lbf	45
Dimensional Stability	ASTM D1204	Certified	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D5397	One per batch	hr	500
Oven Aging - % retained after 90 days	ASTM D5721	Per formulation (5)		
HP-OIT (min. avg.)	ASTM D5885		%	80
UV Resistance - % retained after 1,600 hr	ASTM D7238	Per formulation (5)		
HP-OIT (min. avg.)	ASTM D5885		%	50
SUPPLY SPECIFICATIONS(Roll dimensions may vary ±1%)				
Roll Dimension - Width	-		ft	22.5
Roll Dimension - Length	-		ft	830
Area (Surface/Roll)	-		ft ²	18675
Color (one side) (4)	-			White

NOTES

1. Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.
4. Black or grey spots may be visible on the textured surface. Smooth edge may not have the same consistent shade of color as the membrane itself. The colored layer may cause the carbon black content results to be higher than 3%.
5. Certified by core (black) formulation on geomembrane roll or molded plaque.
11. The minimum average thickness is ±10% of the nominal value.

* All values are nominal test results, except when specified as minimum or maximum.

* The information contained herein is provided for reference purposes only and is not intended as a warranty or guarantee. Final determination of suitability for use contemplated is the sole responsibility of the user. SOLMAX assumes no liability in connection with the use of this information.

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.

APPENDIX I
ETLF OPERATIONS HEALTH AND SAFETY PLAN VERSION 2.2



ETLF Operations HASP

Chiquita Canyon ETLF Response
Castaic, California

August 14, 2024

Version 2.2

Required Approval			
Incident Commander	David Matthews	Date	8/22/24
(signature)	David Matthews		
CCL District Manager:	Steve Cassulo	Date:	8/22/24
(signature)	Steven J Cassulo		
CCL Assistant District Manager:	Nicole Ward	Date:	8/22/2024
(signature)	Nicole Ward		

Emergency Contact Information

Chiquita Canyon Landfill	
Site Address:	29201 Henry Mayo Drive, Castaic, CA 91384
Site Emergency Contact:	Steve Cassulo (661) 371 - 9214
Alternate Site Contact:	Nicole Ward (661) 425 - 4619
Chiquita Canyon Landfill	
Local Emergency Response:	911
Medical Facility:	Henry Mayo Newhall Hospital (661) 200 - 2000
Medical Facility Address:	Henry Mayo Newhall Hospital, 23845 McBean Parkway, Valencia, CA 91355

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1.0 Introduction

Chiquita Canyon, LLC's ("CCL") priority is the protection of human health, safety, and the environment. This plan identifies potential hazards to the extent possible based on available information at the Chiquita Canyon Landfill (the Landfill) located at 29201 Henry Mayo Drive, Castaic, CA 91384, and describes precautions that workers need to follow for all activities while in Elevated Temperature Landfill (ETLF) operation areas. The ETLF operation areas of the Landfill are defined as areas of the Landfill affected by the ETLF reaction (Appendix B at the end of this plan), surrounding ETLF support areas (e.g., laydown yards), associated leachate collection/storage tanks, and leachate tank farms.

This plan is a living document that will be updated as conditions change, new information becomes available, and as the ETLF operation area evolves. Updates made to this plan will be documented and provided to ETLF operation area workers during safety briefings.

Table 1 Project Organization

Project Role	Name	Company	Phone Number
CCL ETLF Project Team Leader	Dave Matthews	CCL	(330) 635-4885
CCL District Manager	Steve Cassulo	CCL	(661) 371-9214
CCL Assistant District Manager	Nicole Ward	CCL	(661) 425-4619

1.1 Scope of Work

In the ETLF operation areas, the potential hazards described herein have been identified. All work conducted in these areas performed by any CCL employees or contractors shall follow the protocols outlined here in and all applicable safety plans for the ETLF operation areas and the Landfill. Work performed in the ETLF operation areas will also conform to CCL's Injury and Illness Prevention Program (IIPP) as mandated by California Senate Bill 198 and Enforced by Cal-OSHA under the General Industry Safety Orders Section 3203.

1.2 Amendments to the ETLF Operation Areas Health and Safety Plan

This Health and Safety Plan is based on information available at the time of preparation. Unexpected conditions may arise which necessitate changes to this plan. Unplanned activities and/or changes in the hazard status should initiate a review of major changes in this plan. Amendments must be approved by the incident management team prior to implementation.

All notes, documentation, and records must NOT be discarded after their use. Documents are to be submitted to designated personnel for record retention.

2.0 Code of Safe Practices

This plan was developed for CCL and their contractors working within the ETLF operation area and provides area-specific procedures to prevent incidents at the Landfill. Beyond these documents, addressing worker health and safety within the ETLF operation areas, is an ongoing process that involves hazard identification, hazard analysis, hazard control, hazard re-evaluation, and the participation and training of ETLF operation area personnel.

The active involvement of every employee is encouraged through hazard reviews and regularly scheduled safety briefings (e.g., toolbox meetings, tailgate meetings, etc.). Contractors and individual work groups are responsible for holding safety meetings or attending ETLF Operation Area safety meetings if not conducting their own. The supervisor or designee of a work group will conduct the safety briefing. Employee involvement is the cornerstone of incident prevention. Additionally, every employee is required to look out for their coworkers when they do not seem focused on the work at hand, and to adhere to the following principles.

- Do not dismiss the importance of situational awareness and the practice of good common sense when working in the ETLF Operation Area. Be consistent and take personal responsibility for your own safety and those you work with.
- Be aware of the dangers with each task being worked on. Remember and follow safety procedures and safe work practices developed to protect us. Wear the proper Personal Protective Equipment (PPE), do not take short cuts, and do not become complacent or let your guard down by developing a false sense of security while at work.
- There are a number of planning processes that take place prior to the execution of a given task, including job hazard analysis, that must be completed by the worker or work group.
- Supervisory personnel or safety representatives will conduct visual work area inspections, which are intended to verify that established plans and procedures are followed, changes in conditions are identified, the effectiveness of controls is assessed, and new hazards are identified and communicated to all employees.

Contracts for operation, maintenance, monitoring, and construction activities for various environmental control systems within the ETLF Operation Area will include a requirement that safety procedures, as set forth in this plan, Landfill health and safety plans, and the Contractor's health and safety plans will be followed by those involved in the work. CCL is committed to providing a healthy and safe work environment for everyone conducting work activities at the Landfill.

2.1 Contractor Management

It is the policy of CCL to select, contract with, and oversee contractors with the same priority and emphasis on safety that we practice with our employees. Contractors are contractually obligated to comply with CCL, state and federal health and safety regulations. The purpose of the contractor safety management program is to verify that CCL continues to improve contractor health, safety, and environmental performance, and to establish a standard for evaluation/selection and development of our contractors.

This program applies to any contractor that has a contractual relationship with CCL at the Landfill. General requirements for contractor selection and involvement at the Landfill are provided herein.

2.2 Contractor Selection and Approval Requirements

CCL will obtain prequalification submittals (e.g., health and safety plan)) from qualified candidates for each contract. A safety review of the contractors will be performed by CCL Management. The scope of the review will be commensurate with the hazards and risk exposure involved, and a determination will be made as to whether or not the contractor's safety program meets or exceeds CCL's safety program. The selected contractor will be required to conform to CCL's health and safety programs for work performed at the Landfill and the ETLF Operation Area. If a contractor's safety program is deemed insufficient or has a "Not Qualified" safety status, it will not be utilized by CCL at the Landfill.

Contractors will be required to follow or implement the work practices and systems described below while performing work related to the ETLF operation areas:

- The contractor safety program must meet or exceed the CCL safety program.
- CCL management will conduct periodic safety surveys of contractors. Safety discrepancy observations will be reported to the appropriate contractor representative for immediate correction.
- There is a requirement for each contractor to use/provide and maintain their own safety program (job hazard analysis, inspections, operating procedures, safety standards) in addition to the CCL program. The safety program must be readily available for review by ETLF operation area personnel.
- Attend a ETLF operation area orientation and pre-job kick-off meeting provided by CCL prior to any work beginning.
- Participate in regularly scheduled safety meetings.

- Verify that personnel have the required training and competency for their work.
- Comply with the CCL permit process for high-hazard work, including hot work and confined space entry.
- Report all injuries, spills or releases and property damage incidents immediately to CCL and site safety.
- Comply with safety rules, including speed limits.
- Conduct equipment inspections.
- Wear the required PPE.

3.0 ETLF Operation Area Emergency Response Plan (EAP)

CCL will oversee the management of the ETLF Operation Area Emergency Response Plan procedures within the landfill by implementing the CCL Emergency Response Plan. Initial Emergency Response Plan procedures within the ETLF operation areas are provided within this section. These procedures will be implemented at the ETLF operation areas whenever there is an imminent or actual emergency situation and CCL will notify personnel by radio, telephone, horn or other notification system. An air horn positioned within the landfill will serve as the primary notification, with other methods employed if needed based on a specific work task. An air horn alert will be one of two types:

1. **EVACUATION:** Three short blasts three times will signal an evacuation of the landfill.
2. **STOP WORK:** One long blast will signal landfill wide stop work. All workers will remain in place until notified further.

CCL employees and contractors must evacuate the ETLF operation area when an emergency occurs in accordance with the Landfill's Emergency Response Plan or any ETLF operation area specific instructions. When an evacuation is ordered, CCL employees and contractors will gather at designated evacuation muster points.

This is an active landfill. Access and bench roads on the Landfill can and will change to accommodate work areas, waste disposal and working face areas. This may require different routes for traveling to the main office muster point. CCL employees and contractors will verify that they know how to quickly and safely depart and leave the ETLF operation Area.

Personnel entering/exiting the ETLF operation areas must be accounted for via QR code or other method to assist with accountability ETLF operation areas in the event of an emergency. At the muster point (or alternate gathering point) the CCL manager or contractor supervisor will account for personnel under their authority.

Any injury or illness must be reported, as soon as it is safe to do so, to a CCL site representative, and the onsite safety representative. The CCL site representative and the onsite safety representative, in the case of an injury or suspected injury (even if it is perceived as minor), will notify the Incident Commander as soon as practical (see Emergency Telephone Numbers on the cover). If the incident is serious (i.e., fatality, amputation, work-related inpatient hospitalization, or loss of an eye, or any serious degree of permanent disfigurement), notify the Incident Commander immediately. The Incident Commander will notify the District Manager's office and implement the landfill EAP.

Equipment involved in serious-injury accidents should not be moved until the CCL Canyon Incident Commander can inspect the accident scene. However, equipment may be moved if doing so is necessary to remove victims or prevent further equipment damage.

If CCL determines that the ETLF operation area and/or the landfill has had a release, fire, or explosion that could threaten human health, the District Manager or alternates will call **9-1-1** and contact the Los Angeles Fire and Sheriff's Departments immediately. The Incident Commander and/or District Manager or alternates will coordinate with local agencies to determine if a local evacuation is necessary and implement the landfill Emergency Response Plan.

After the emergency is over, CCL will provide for the cleanup, treatment, storage, and disposal of the recovered waste, liquid and affected soils and water. Solid waste, such as affected soil and sorbent pads, will be placed in a roll-off bin for profiling and disposal at an off-site treatment, storage, and disposal facility. Based on the results of the profiling, disposal onsite may be possible.

3.1 Medical Facility Contact and Location Information

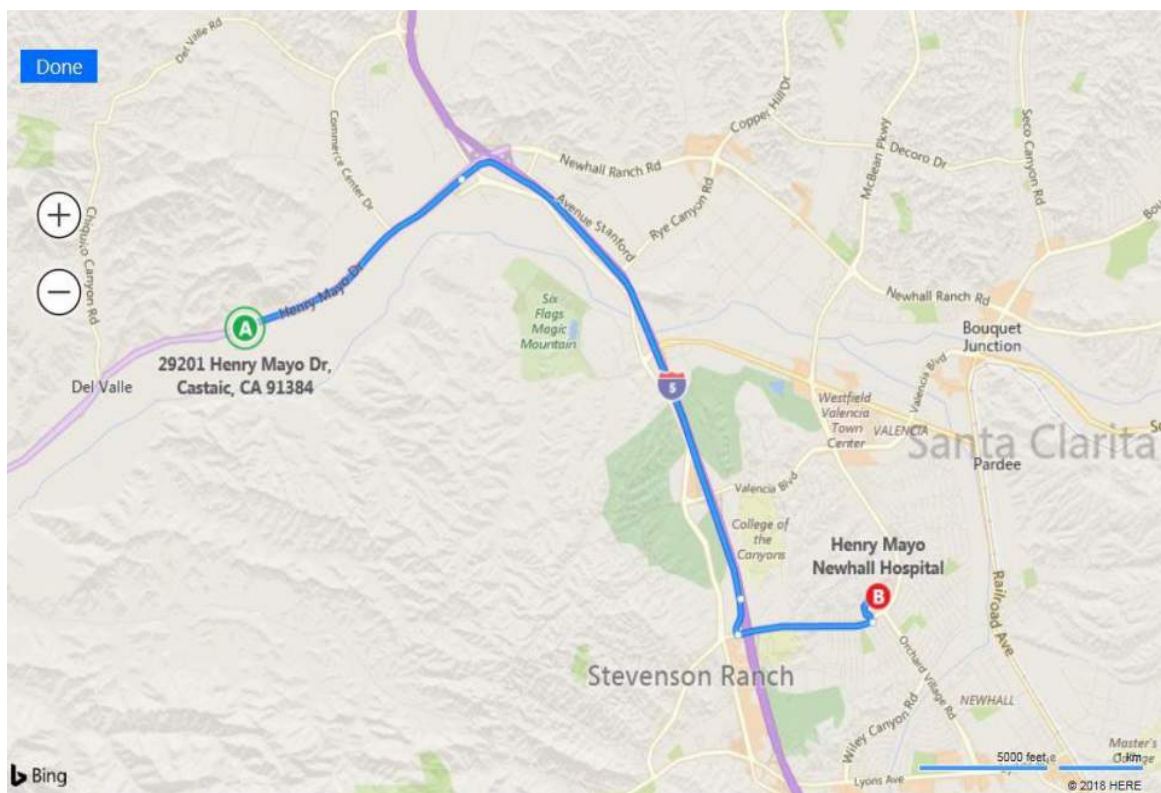
The nearest medical facility is located at the Henry Mayo Newhall Hospital 23845 McBean Parkway, Valencia, CA 91355.

Figure 1. Map and Directions to Nearest Medical Facility

A 29201 Henry Mayo Dr, Castaic, CA 91384

↑	1. Depart CA-126 / Henry Mayo Dr toward Wolcott Way	2.0 mi
	2. Take ramp right for I-5 South toward Los Angeles ▲ Moderate Congestion	4.0 mi
↘	3. At exit 168 , take ramp right for McBean Pkwy toward California Institute of the Arts / Hospital	0.3 mi
↙	4. Bear left onto McBean Pkwy	1.0 mi
↙	5. Turn left onto road	262 ft
↙	6. Turn left onto road	0.2 mi
↘	7. Turn right onto road	161 ft
	8. Arrive on the left	

B Henry Mayo Newhall Hospital



3.2 Employee Alarm System

If an incident or emergency occurs requiring an alarm. Employees or contractors may initiate an alarm by calling one or more of the site emergency contacts on the second page of this document. Call 911, as appropriate, to report fires and other emergencies.

3.3 Rescue and First Aid

Stop and/or suspend work when an injury, accident or a site condition that is deemed unsafe occurs. CCL employees and contractors are encouraged to raise any safety concerns with the site safety representative in a timely manner and to suspend work if they feel conditions have become unsafe.

First aid will be provided on a voluntary basis within the scope of the provider's training. First aid kits and fire extinguishers are available in each CCL work truck. Automated External Defibrillators (AEDs) are located in the office and maintenance office.

Safety showers and eyewashes (portable) are located throughout the facility where splash and chemical exposure to leachate and other chemical exposures may occur.

4.0 ETLF Operation Area Hazards

The primary hazards associated with the ETLF Operation Area are related to the elevated temperatures and pressures that are present, the occurrence of rapid waste decomposition and settlement, worker exposure to leachate, and leachate vapors. As a safety practice, a buddy system, or regular check-ins, will be used for personnel working in the ETLF Operation Area or for after-hours work within the ETLF Operation Area.

No drinking alcohol or use of illegal drugs will be allowed in ETLF operation areas. Anyone reporting to work under the influence of alcohol and/or illegal drugs will be subject to disciplinary action, which may include immediate discharge. Any person bringing illegal drugs onto CCL premises will be subject to immediate discharge. Employees under a physician's care and/or taking prescribed narcotics must notify the Project Manager, the safety representative, or their supervisor.

Eating, drinking, with the exception of water or other hydrating drinks (e.g., Gatorade), smoking is not allowed in the ETLF Operation Area. Within the ETLF operation areas, locations where adequate sanitation can be maintained will be provided.

No horseplay or practical jokes are permitted while working ETLF operation areas.

4.1 Chemical Hazards

The following chemical hazards should be considered before performing any task or work at the Landfill. The analysis will depend on a thorough understanding of the ETLF Operation Areas physical

and chemical characteristics, and the task(s) being performed. When handling or in proximity to liquid chemicals or vapors, additional PPE (e.g., glasses and face shield) may be required. See the CCL Canyon Landfill Personal Protective Program for more information.

4.1.1 Unidentified Chemical Hazards

The disposal of residential and commercial waste results in the creation of potential chemical hazards that may not be possible to identify during work activities. Residential and commercial waste may include containers which are partially full, or contain residues, of discarded chemicals, biohazards, flammable materials, and other hazards that, while not willingly accepted by CCL, may have been improperly discarded in received waste. Labels on these containers may have degraded or been removed, and the contents may leak. Generally, these items will be covered by soil or other barrier, but certain activities such as drilling or digging may uncover these hazards. Avoid interaction with unidentified containers and standing liquids to reduce exposure risk posed by these substances and contact CCL with any concerns prior to proceeding with work.

4.1.2 Landfill Gas

Landfill gas (LFG) varies from one area to another. LFG consists primarily of methane (about 55 percent) and carbon dioxide (about 45 percent). Other components that may be present include water vapor, nitrogen, carbon monoxide, hydrogen sulfide, and other toxic compounds. LFG is flammable and potentially explosive. LFG gas within the ETLF Operation area may contain elevated concentrations of hydrogen.

4.1.3 Elevated Hydrogen

As mentioned, LFG from the ETLF operation areas may have an elevated hydrogen content. When working near LFG, flammability must be monitored to reduce the risk of explosion.

4.1.4 Methane

Methane gas is produced at landfills from the decomposition of waste. Methane is a colorless, odorless, flammable, and potentially explosive gas. The flammable range of methane is 5 to 15 percent by volume. Methane is a simple asphyxiant as it is capable of displacing oxygen. Personnel must wear a 5-Gas monitor when working in any area where gas may be present.

4.1.5 Hydrogen Sulfide (H₂S)

Hydrogen sulfide is colorless with a strong “rotten egg” odor which can diminish over time due to nasal fatigue.¹ As a result, odor is not an appropriate warning property for the presence of hydrogen sulfide. Hydrogen sulfide is highly flammable, acts directly on the nervous system and can result in death or permanent injury following short exposure to quantities near the Immediately Dangerous to

¹ The ability to smell hydrogen sulfide returns following removal from the source of exposure.

Life or Health (IDLH) of 100 ppm. The concentration of hydrogen sulfide varies by area but may be present up to 200 parts per million (ppm), which exceeds the IDLH concentration of 100 ppm. Hydrogen sulfide can accumulate in low areas such as sumps, holes, ditches, or depressions. Hydrogen sulfide is a primary hazard in confined space entry and tank headspaces, and other areas where leachate may be confined. Personnel must wear their 5-Gas monitor when working in any area where hydrogen sulfide gas may be expected to present a hazard.

4.1.6 Benzene

Benzene is a known human carcinogen and can result in detrimental effects to the blood-forming (hematopoietic) system during prolonged exposures. Benzene is present in leachate vapor and is a minor component (< 0.1 % by weight) of leachate and may represent an increased hazard when total VOCs increase, particularly when total VOCs are greater than the site action level in Table 2. When leachate is confined in a tank, pipe, or other enclosed space benzene vapor concentrations may be present within the enclosed space at concentrations above occupational exposure limits. During and following drilling of well boreholes in or near the reaction area, benzene vapor may be emitted into the vicinity until final well completion at concentrations greater than the Cal/OSHA Short Term Exposure Limit of 5 ppm. Work should be conducted in accordance with all applicable requirements of Cal/OSHA Title 8 § 5218 – Benzene when benzene may be present greater than occupational exposure limits.

4.1.7 Hydrogen Peroxide

The hazards associated with the use of hydrogen peroxide (especially highly concentrated solutions) are well documented. Peroxide reactions can be exothermic and generate high temperatures. Contamination of concentrated peroxide causes the possibility of an explosion. Readily oxidizable materials or alkaline substances containing heavy metals may react violently. Solvents (acetone, ethanol, glycerol) will detonate on a mixture with peroxide of over 30% concentration, the violence increasing with concentration. Concentrated peroxide may decompose violently in contact with iron, copper, chromium, most other metals or their salts, and dust (which frequently contain rust). Mixtures of alcohols with concentrated sulfuric acid and strong hydrogen peroxide can cause explosions. Mixtures of ethyl alcohol with concentrated hydrogen peroxide form powerful explosives. Consult the Safety Data Sheet (SDS) in Appendix C for additional information.

4.1.8 Leachate/LFG Condensate

Leachate is any liquid that has come in contact with waste. Once liquid percolates through waste, it reacts with the products of decomposition, chemicals, and other materials to produce leachate. LFG condensate is produced when LFG cools and moisture condenses from the vapor phase to the liquid phase. Risks from waste leachate and condensate are due to its high organic contaminant concentrations and high ammonia nitrogen. Some of these compounds may cause damage to skin and eyes on contact, be absorbed through the skin, or be carcinogenic. Leachate from the reaction

area is known to contain carcinogenic chemicals such as benzene and other organic compounds, metals such as arsenic, and other hazardous organic and inorganic compounds. Methane and hydrogen sulfide may also be dissolved in the leachate or condensate and could pose a hazard in poorly ventilated areas. Bacteria and other microorganisms may be present in leachate which could result in infection of open wounds or other illness.

Workers should avoid direct contact with leachate and condensate. Where there is a risk of splashing, spilling, or spraying of leachate or condensate, appropriate measures should be taken to avoid contact with skin and eyes. If skin contact occurs, rinse with copious amounts of water for at least 15 minutes. Remove any contaminated clothing and discard. The portable eye wash station has a movable shower head to allow for rinsing for 15 minutes. Workers should verify that contaminated PPE and clothing are properly decontaminated and/or disposed and should avoid contact with those items. Consult with site safety.

4.1.9 Volatile Organic Compounds (VOCs)

Volatile Organic Compounds (VOCs) are a broad class of chemicals which are contained in leachate and leachate vapor. The health effects and occupational exposure limits for these compounds vary by the individual chemicals within the mixture and may present a relatively low hazard (e.g., isopropyl alcohol) or a higher hazard (e.g., benzene). Due to the complex mixture of VOCs in leachate vapor, the probability that transient short-term adverse health effects will develop such as dizziness, nausea, headaches, and other symptoms increases as VOC concentrations increase. When measuring these compounds as total VOCs it can be difficult to identify the quantity of a specific hazardous component in the field without more specialized equipment than a 5-gas meter. While there is no established exposure limit for the mixture of VOCs in leachate vapor at CCL, analysis of VOC mixture has been conducted and action levels in Table 3 for VOCs has been established to reduce the probability that exposure limits for individual components of the VOC mixture would be exceeded.

4.1.10 Caustic Soda (Sodium Hydroxide)

Caustic soda is a sodium hydroxide solution which is strongly basic. Sodium hydroxide reacts rapidly and exothermically with organic and inorganic acids, with organic and inorganic acid anhydrides, including oxides of nonmetals such as sulfur dioxide, sulfur trioxide, phosphorus trioxide, phosphorus pentaoxide, and with organic and inorganic acid chlorides. Reaction with aluminum and zinc may produce hydrogen, a flammable gas. May initiate polymerization in polymerizable organic materials: a violent polymerization results. Contact can cause severe burns to eyes, skin, and mucous membranes. Use of appropriate chemical protective clothing, gloves, goggles and/or face shield are required when handling to protect skin and eyes. The solution must be handled in a manner that minimizes opportunity for spills, splashes, and pressurized release.

4.2 Physical Hazards

The following physical hazards should be considered before performing any task or work at the landfill by all employees and contractors in collaboration with site safety. Depending on the task(s) being performed, any or all these hazards may be present.

The high temperature and pressures increase the potential for hazardous conditions within the ETLF Operation Area. Personnel should carefully evaluate tasks to be performed to identify which hazards are present and which protective measures should be undertaken or in place.

WARNING: The potential for burns to the eyes, face, and hands, or the unexpected release of pressurized and hot gas or liquids, is a primary and ongoing consideration. The following items below should be addressed when working in the ETLF Operation Area.

4.2.1 High Temperature Gas

In addition to potential inhalation hazards normally associated with Landfill Gas (LFG), the ETLF Operation Area contains LFG with temperatures (>63 °C [145 °F]) that are much higher than normal. This hot gas presents a potential burn and/or scald hazard. Caution should be taken to avoid close proximity to pipes and valves that may release hot gas. LFG should be collected via system vacuum, when possible, to reduce or remove the hazard. Closing wells and allowing pressure to build can be detrimental to the exothermic ETLF Operation, and the removal of vacuum and introduction of pressure can actually provide a trigger, allowing the ETLF Operation to grow and temperatures to climb. When possible, LFG should be shut off or isolated to reduce or remove the hazard when conducting activities in the ETLF Operation Area. Venting should be avoided, as odors are typically a concern at the ETLF Operation Area.

4.2.2 High Temperature Liquid

Hot liquids (>63 °C [145 °F]) are also present in the ETLF Operation Area. Hot leachate presents a potential burn and/or scald hazard and has the potential to cause exposure to chemical constituents. Caution should be taken to avoid close proximity to pipes and valves that could release hot liquids. Leachate and LFG condensate should be shut off and drained, when conducting operations on pipes and wells within the ETLF Operation Area. In addition to high temperature, the ETLF Operation Area liquids may typically have elevated Biological and/or Chemical Oxygen Demand constituents, and the liquids may become more acidic (<6). Total Suspended Solids (TSS) may also increase, making the liquids more conductive to electricity. Some organic compounds may have highly elevated conductivity.

4.2.3 High Gas Pressure and Flow

Gas or liquids in LFG wells, sumps or piping systems can pose hazards related to the presence of higher pressures, flammable liquids/vapors. Any well, sump or conveyance line that has the potential to contain these hazards must be carefully evaluated before performing work. Do not open a well or pipe without following the safety procedures outlined in the applicable job hazard analysis or work plan. Because it may not be feasible to purge wells and piping of all flammable vapors or liquids, the applicable job hazard analysis or work plan must include documented procedures and the special equipment that is necessary to provide effective protection for workers. Air monitoring with a 5-gas meter should be conducted during these tasks. Any hot work (e.g., cutting/grinding/drilling) must be conducted under a hot work permit which includes monitoring for flammability. The presence of flammable gas or liquid presents additional hazards from fire, explosion, and increased temperatures.

4.2.4 Ground Subsidence (Settlement)

The subsidence or settlement of waste at the ETLF Operation Area must be closely monitored. Due to the rapid nature of the anaerobic decomposition associated with the ETLF Operation, large areas of subsidence are typical. Changes in grade due to subsidence may cause failure of installed conveyance systems such as gas collection or leachate piping. Some of these conditions may be visible from the surface, while others occur out of sight (below grade). When walking or driving across the surface of the ETLF Operation Area, personnel should always pay close attention, as underground voids or soft spots may be present and collapse which may cause vehicles to become stuck or represent a slip, trip, or fall hazard. In some cases, collapses may result in an individual becoming entrapped. When driving vehicles, or walking, stay on established roads whenever possible. If working out of sight of other workers, a buddy system must be used, or communication with regular check-ins.

4.2.5 Weather

Personnel should always maintain situational awareness of changing weather conditions. Additionally, a safety briefing should occur among workers if weather may present a hazard for work operations. The current weather for the Landfill can be accessed via the QR code below or other weather reporting system:



[Link to current weather](#)

The danger of lightning strikes increases when work occurs on the elevated surface of a landfill. Lightning can strike miles ahead of a storm when no rain is present. When a lightning strike is detected within 10-miles of the work area a 30-minute standdown will occur. The standdown will remain in effect until 30-minutes after the last detected lightning strike in a 10-miles radius of the work site. All personnel should seek shelter off the elevated surface of the landfill and remain inside a building (primary) or vehicle (secondary) until the danger passes. Do not take shelter near tall objects such as power lines, trees, antennas, or flare stacks.

4.2.6 *Thermal Stress*

Thermal stress (heat stress or cold stress) hazards and strategies for mitigating impact on worker safety and health can be addressed based on information obtained in the OSHA-NIOSH Heat App.

Workers who are exposed to extreme heat or work in hot environments may be at risk of heat stress. Exposure to extreme heat can result in occupational illnesses and injuries. Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat rashes. Heat can also increase the risk of injuries in workers as it may result in sweaty palms, fogged-up safety glasses, and dizziness. When temperatures exceed 80°F and 95°F additional heat stress management actions are required by Cal/OSHA [Title 8 § 3395](#).

In winter weather conditions, there is a potential for injury from cold, including dehydration, frostbite, heavy shivering, excessive fatigue, drowsiness, irritability, and euphoria. If workers show these symptoms, work must cease and affected personnel must rest in heated buildings or vehicles.

Supervisors or work team lead will be aware of weather conditions predicted for their shift, monitor conditions throughout the day, and consult the appropriate heat and cold stress management plan for additional details when necessary.

4.2.7 *Vehicular Hazards*

The maximum speed within the ETLF Operation Area and on the Landfill is 9 mph. Speed should be adjusted downward according to conditions, and all posted traffic control signs obeyed.

Be cautious of all motor vehicles. As a pedestrian, look 360° before walking to identify any moving vehicles in your nearby vicinity. Personnel must wear reflective safety gear as the outermost layer of clothing in ETLF operation areas, day or night.

Personnel are not permitted to operate a motor vehicle without seatbelts being properly worn. When operating a motor vehicle, look both ways before entering a roadway or crossing intersections. Look for pedestrians on or near roadways. Do not email or text while operating a motor vehicle. Driving at dusk and dawn or low light conditions decrease driver visibility and be aware that animals are much more active during these times. Driving on wet, snowy, gravel, or dirt roads warrant operation of the

vehicle at a conservative speed. Not all gravel road crossings are controlled crossings; some do not have stop signs. Drivers should follow posted speed limits of 9 miles per hour (MPH). Personnel must abide by client guidelines regarding driving while using cell phones. Under no circumstances are personnel permitted to text or email while driving. Personnel should pull over safely, away from traffic, to conduct cell phone or radio communications. Once you have secured your seatbelt, please adjust your window and driver mirrors. Do not block windows with contents such that your view is obstructed while driving.

Heavy Equipment: excavators, bulldozers, dump trucks, vacuum trucks, commercial pickup trucks, and other heavy machinery may be present at the Landfill or the ETFL operation areas during remediation activities. Stay outside of the boom radius of any lever-based heavy machinery. Heavy equipment has the right of way, always ensure operator eye contact prior to movement. Loaded haul equipment has the right-of-way over empty haul equipment.

4.2.8 Illumination

For areas where night operations will take place lighting must be used to ensure worker safety. All areas where tank gauging, leachate transfer, or other nighttime work activities are occurring, must be provided with adequate lighting.

4.2.9 Noise

The ETFL operation areas are considered non-traditional and often difficult to characterize noise exposures. Please keep hearing protection readily accessible. For work areas experiencing high noise levels (greater than 85 dB) and/or impact noise (greater than 140 dB), please utilize hearing protection. Tasks requiring hearing protection include pumping into and out of frac tanks, working in close proximity to fans, generators, and light plants, or work around running heavy equipment.

4.2.10 Slip, Trip, and Fall Hazards

Uneven and slick terrain provides an environment in which slips, trips, and falls should be considered. Be aware of your travel path prior to walking or changing directions. Search for any obstructions that may present a trip hazard. Equipment piping and truck piping are also known tripping hazards.

Treacherous footing on slopes (i.e., sandy soil/clay), heavy equipment, or snakes and other animals that could be present on slopes or in bushes all present hazards at the Landfill. Walking, driving, or operating heavy equipment on steep hills or uneven terrain can be dangerous. These areas should be avoided whenever possible. When it is necessary to walk or drive in such locations, great care should be taken. Move slowly and be aware of loose materials or holes that could be present. Sharp items or spilled materials may also exist and should be avoided. When traversing steep terrain, drive straight up or down slopes to reduce the possibility of roll over. Holes, pits, and ditches may be present. Falling or driving into these hazards can be avoided by becoming familiar with the Landfill. Tall

grass or vegetation can hide these features. Do not drive in areas with which you are not familiar. Discuss access routes and hazards with site personnel. A good rule of thumb for driving is: “When in doubt—get out.” To reduce the opportunity for slip, trip, and fall hazards:

- All material must be stored in a manner that will verify that the material is safe from unexpected movement, falling, rolling, blowing, or any other uncontrolled motion.
- Materials and supplies should be kept away from the edges of floors, stairways, and access/egress routes (36 inches minimum).
- Forms and scrap lumber with protruding nails and all other debris must be cleared from work areas, passageways, stairs, and in and around buildings or other structures.
- Tripping hazards, protruding nails, oil slicks, scrap materials, and other hazardous conditions occurring during the course of the job must be eliminated as work progresses.
- Tools and equipment should not be strewn about where they might cause tripping or falling hazards, and must, at the end of each workday, be collected and stored or disposed of as appropriate.
- Protruding reinforcing steel (rebar) must be properly capped or otherwise protected to prevent a hazardous condition.
- Everyone should keep the work area and other areas where people may walk clean and orderly.
- Trip hazards must be marked or removed.
- Employees must be informed of the hazards associated with walking on slippery and or uneven surfaces.
- When possible, pedestrian traffic will be redirected around potentially dangerous areas.
- Oil spills and slippery spots must be cleaned up immediately.
- Extra precautions should be taken when walking on steel decking during wet/icy weather conditions.
- Never walk on piping, never take dangerous shortcuts, and avoid jumping from elevated places.
- Use handholds and steps when mounting or dismounting equipment.

4.2.11 Electrical Hazards

The location of all electrical power lines should be determined before any digging or excavation is performed. The presence of overhead electrical power lines should be determined so that contact with tall equipment (loaders, track hoes, etc.) can be prevented. Contracted locater services should be used before excavating or drilling and/or physical protective measures (barriers or line covers) should be used to prevent damaging or striking power lines. Some of the most basic safety requirements when dealing with electrical hazards are as follows:

- Only qualified electricians are to perform installation and repairs to electrical systems.
- When working with electrical devices, know and use a lockout procedure, including those required by government regulations.
- If electrical cables must be laid on the ground, designate crossings and place a protective cover over the cable. Guard other areas so that vehicles do not run over the exposed cables.
- Use tools with a three-wire plug and make sure the connections are tight.
- Check tools, equipment, and cables frequently for safe conditions.
- Disconnect tools before making adjustments or repairs.
- Use caution when using power tools in a wet area; the potential for shock hazard is increased.
- Extension cords used with portable electrical tools and appliances will be of three-wire types. Grounds are never to be removed from an extension cord. Electrical and extension cords or cables are not to be laid on the floor in walkways, unless they have proper protection.
- Ground Fault Circuit Interrupters will be used with all extension cords.
- Temporary lights will be equipped with guards to prevent accidental contact with the bulb.
- Splices must have insulation equal to that of the cable.
- Unless working within a Panel box, they should be covered at all times.
- Access to electrical breakers or switches must be unobstructed (3 feet of clearance in front of breakers or switches are recommended).

- Portable ladders must be equipped with non-conductive side rails if used in areas where the employee or ladder could contact exposed energized parts.
- Covers must be installed on all junction boxes, outlets, fittings, and switches to prevent accidental contact with live parts.

When working in a confined space, enclosed space, or other tight area that contains exposed energized parts:

- Protective shields, barriers, and insulating materials will be provided and used to avoid inadvertent contact with energized parts.
- Doors and hinged panels must be secured to prevent swinging into an employee and causing contact with exposed energized parts.

4.2.12 Fire and Explosion Hazards

Fuel such as gasoline and diesel are present at the Landfill. The primary risk associated with these materials is fire. Leachate may also be flammable or produce flammable vapors. Keep all ignition sources away from flammable materials.

The nature of the ETFL operation area and the existence of an ignition source, fire, variable pressures, and variable unknown sources may create explosion hazards. Fire protection at work areas includes the following objectives:

- Preventing loss of life and personal property.
- Protecting property.
- Providing uninterrupted operations.
- Preventing inception of fire.

Containers with leachate or other flammable materials may explode when heated. Vapors may travel to sources of ignition and flash back. Some vapors are heavier than air and can spread along the ground and collect in low or confined areas (basins, drains, tanks) creating fire or explosion hazard. Refer to Table 3 for information regarding ETFL operation areas action levels for flammable atmospheres.

Due to the presence of potentially flammable vapors, grounding and bonding must be in place when loading and unloading trucks. All stationary tanks must be grounded and bonded as well. When loading highway tankers, tanks must be vented to prevent an increase in pressure. All equipment must be shut off and allowed to cool before fueling operations can begin.

Operations may include hot work (i.e. cutting or grinding). Due to the potential fire and explosion hazards of various present hydrocarbons and gases within tanks and connected systems, **WELDING, THE USE OF TORCHES, GRINDING, CUTTING, DRILLING, AND OTHER SIMILAR ACTIVITIES IS NOT PERMITTED WITHOUT A HOT WORK PERMIT**. Before air monitoring for hot work is started, a **qualified person** and other contractors or personnel involved shall discuss the planned project completely, including the type of hot work to be conducted, the hazards in the area, and the provisions of the permit. If hot work occurs, air monitoring for the hot work permit, to include at minimum, LEL monitoring (confirmed by VOC readings) will be performed to determine whether combustible vapors are detected at or near the relevant Action Levels.

Fire extinguishers should be placed in convenient conspicuous locations throughout the ETFL operation area and on heavy equipment; all fire extinguishers should be identified clearly. ABC dry powder fire extinguishers will be used unless a specific hazard calls for another type. Extinguishers should be recharged and inspected regularly, and tags indicating the date of recharge should be affixed. During cold weather, fire extinguishers should be protected from freezing. Workmen should be instructed in the operation of extinguishers, and in the selection of the proper type of extinguisher at initial assignment, and annually thereafter. Replace or recharge a fire extinguisher whenever it has been used. Although it may not be empty, the fire extinguisher may not work when needed a second time.

One source of fire hazard within our control is poor housekeeping. Regular cleanup of scrap material, oily rags, oil, grease cans, and other residue of construction operations will not only remove or reduce the fire hazard but will promote general safety at the same time. Clothing that has oil or paint stains will not be placed in confined spaces; it will be hung up in the open air. Oily rags and waste will not be allowed to accumulate or be stored in closed spaces but will be disposed of when no longer needed. Areas where combustibles are stored will not contain a heating source or, if heating is necessary, it will be placed so as to avoid overheating of these materials and will have adequate ventilation. Good housekeeping will remove part of the combustible materials' danger.

Metal refuse cans with self-closing or sealing lids should be provided in several convenient locations, and especially where oily waste is produced, such as in the maintenance areas.

Depending on the size of the job, and the particular fire hazards involved, periodic inspection of the jobsites is necessary by the supervisor. The following sources of fire danger should be checked regularly:

- Temporary heating devices.
- Electrical wiring and equipment.
- Storage of flammable liquids and materials.
- Extension cords.
- The vicinity of welding and cutting operations; a 30-minute fire watch is required after welding and cutting ceases.
- “No Smoking” enforcement in fire hazard areas.
- All places exposed to sparks and heat if refuse burning takes place.
- Compressors, engine generators, and other internal combustion engines and their fuel supplies.
- Explosive magazines (e.g., grounding and No Smoking signs).

4.2.13 Dust and Airborne Particles

At minimum, safety glasses must be worn within ETLF operation areas, unless inside a vehicle or structure. The Landfill and ETFL operation areas may include dusty conditions or particulate hazards from other sources. If dusty conditions are present, helmet-mounted goggles should replace safety glasses to further protect your eyes from particulate-induced eye injury. All eye protection must meet ANSI Standard Z87.1. Consult Section 6.0 along with the CCL Canyon Landfill Personal Protective Equipment program for additional details.

4.2.14 Elevated Work

While tank gauging or working at an elevation in excess of four feet, appropriate fall protection must be in place to prevent workers from falling from heights if a properly engineered railing is not in place. All work for tank gauging must utilize the provided stair systems or ladder for the manway. Walking from the top of a tank to the top of another tank is not permitted. Elevated work with ladders or fall protection must also be conducted with a spotting system in place.

4.2.15 Water Collection Areas

Low areas where water or waste collects and is held at a depth where workers could fall and become submerged should have fencing, barriers, or railings either temporary or permanently installed. These barriers must prevent workers from falling into the low areas or be placed at such a distance that workers cannot fall into the water hazard.

4.2.16 Equipment Operation Safety

Excavators, bulldozers, motor graders, wheel loaders, backhoes, trenchers, articulated dump trucks, scrapers, soil compactors, compact track loaders, or skid steers loaders forklifts, large trucks, and other vehicles are present at the Landfill. The use of heavy equipment on a jobsite is vital and necessary to the overall success of the Landfill, ETLF Operation Area, and construction projects. Operate only the equipment you are qualified to operate. Unauthorized or unwise use of heavy equipment can result in personal injury, loss of life, or severe loss to materials needed to complete work activities. In addition, trash trucks of various shapes and sizes arrive onsite to dump their loads. Loud noise, traffic conditions, weather and limited visibility can increase the threat of being run over or crushed by these vehicles.

Wear high-visibility vests or coats and coordinate with vehicle operators or spotters when working in the vicinity of these pieces of equipment. Heavy equipment hazards are especially present at or near a working face, earth moving activities, and within the ETLF Operation Area. When working in these areas, equipment operators must be notified. Before starting or moving equipment, walk all the way around it to make sure persons and equipment are clear. These vehicles should not be operated within 50 feet of a person on foot. The use of a second person (as a spotter) should be done when working in these areas. When equipment is being started up or run, no employee should be standing directly in front of or behind it.

Belts, pulleys, sheaves, gears, chains, shafts, clutches, drums, flywheels, and other reciprocating or rotating parts of equipment pose potential nip or pinch points. No guard, safety appliance, or device should be removed or made ineffective unless immediate repairs or adjustments are required, and then only after the power has been shut off and proper lockout/tag-out procedures have been implemented. Guards and devices must be replaced as soon as repairs and adjustments have been completed.

High-temperature lines and equipment may endanger employees or create a fire hazard. Exhausts from all equipment powered by steam or internal combustion engines must be properly released and located so as not to endanger workers or obstruct the view of the operator.

Platforms, foot walks, steps, and ladders used for access to equipment can present slipping and/or falling hazards. It is mandatory to have three (3) points of contact when climbing on or off equipment.

Equipment backing up or swinging loads, or buckets, booms, and counterweights, pose serious hazards to ground personnel. Eye contact must be made with the operator before approaching moving machinery or equipment.

Good housekeeping should always be practiced, especially in keeping walkways and vehicle cabs clean. Items brought on board (thermoses, lunch boxes, tools) must be properly secured to prevent injury or equipment damage.

Equipment malfunctions must be reported to a supervisor. Check all equipment before operating. When parking or servicing equipment, be sure that it is properly blocked to prevent movement, and that all raised attachments or boxes are blocked and/or pinned to prevent them from coming down.

No passengers, except for training or mechanical checks, are allowed on operating equipment. Those individuals must wear seat belts or other safety restraints.

When parking equipment, lower all attachments, such as dozer blades, rippers, or buckets, to the ground.

4.2.17 Equipment Repair Safety

Check tools before use. If they are not in a safe, operable condition, operators should adjust, repair, or replace them, as needed, to make them as safe as possible.

Block all elevated items being worked on that could fall or injure personnel. For example, when working on heavy equipment and changing cutting edges, such as for dozers or scrapers, be sure to block the apron so that it cannot come down. Don't assume the hydraulics will continue to hold it in position.

Check all the way around a piece of equipment before starting or moving it for a test run. Be sure all equipment and personnel are clear.

A "Do Not Operate" tag must be placed in the control area or, if not possible, other area where it can be easily seen. This will help to protect personnel from unexpected starting or movement by another person.

Place empty oxygen and acetylene bottles in a rack with caps in place and secure them with the chain provided in the rack. Shut off oxygen and acetylene bottles when not in use; roll up hoses and store them properly.

4.2.18 Ladder Safety

General Requirements

- Ladder rungs, cleats, and steps must be level, parallel, and uniformly spaced.
- Maintain ladders free of oils, grease, mud, and ice, or other slip hazards.
- Keep the area around the top and bottom of the ladder free of debris and other obstructions.
- Persons using a ladder should face the ladder and have both hands free when ascending or descending (three points of contact). Tools or other items should be carried in pockets or tool belts unless a hand line is used for raising or lowering the item.
- Ladders that are broken, weak, or have missing rungs must not be used. Unless repairs are made immediately, they must be tagged, “Dangerous – Do Not Use.” If the ladder is beyond repair, it should be removed immediately from the jobsite.
- Ladders must not be painted; doing so may hide defects.
- Metal ladders must not be used around electrical equipment.
- Ladders will be inspected prior to use.
- When storing ladders, verify that they are securely attached, hooked or supported. Use appropriate hooks, brackets, or storage systems that holds the weight of the ladder. This eliminates the risk of damage or injury from falling or moving ladders.

Straight Ladders

- Straight ladders must be secured from slipping by:
 - Cleating in front of them.
 - Securing/tying them off at the top.
 - Equipping them with safety feet.
- Straight ladders should be placed at an angle of inclination of 1-foot horizontal for each 4-foot vertical rise.
- Straight ladders should extend at least 3-feet above the platform to be reached. Both sides of the ladder must be resting on a support.

- The top of the ladder will be secured, or the ladder held in place by another person if there is a danger of slipping.
- Sections of ladders cannot be lashed together to increase overall length.

Step Ladders

- Planks must not be used on the top of step ladders.
- Stepladders must not be used as straight ladders. Leaning or resting a step ladder against a support is prohibited.
- A metal locking device or spreader should be used to hold the front and back section in an open position when in use.
- Climbing above the second tread from the top of a step ladder is prohibited.

4.2.19 Manual Lifting

The improper handling and storing of materials can result in injuries. Manual materials handling (i.e., lifting, carrying, pushing and pulling) is the most common cause of work-related injuries with the vast majority related to back injuries. Such injuries can range from relatively mild strains to major, permanently disabling injuries. Injuries to the back and abdominal muscles from lifting heavy loads are one of the most common injuries reported. The main hazards related to materials use, handling and storage involve:

- Improper manual lifting or carrying of heavy, large or un-wielding loads.
- Being struck by materials.
- Being caught in pinch points.
- Being injured or crushed by falling or improperly stored materials.

Before lifting, survey the path being traveled for obstructions and/or obstacles and be able to see above the load when moving an object. Inspect materials for slivers, jagged or sharp edges, burrs, and rough or slippery surfaces. Wipe off greasy, wet, slippery, or dirty objects before trying to handle them. Know the weight of the object being lifted; Get assistance for weights that are over 50 pounds.

Never bend from the waist when lifting. The back should be kept straight and the arms nearly parallel with the body. The knees should be bent to grasp the load with a firm grip. Lifting should be done by

straightening the legs, with the back remaining in a nearly vertical position. Do not twist your torso; instead, move your feet. The procedure for setting down the load is the reverse of lifting the load.

If the object is too bulky or too heavy to be handled by one person, two or more people should be assigned to the task. When two or more people carry one object, they should adjust the load so that it rides level, and each person carries an equal part of the load. In addition, both people should know the destination and path where the object is to be carried.

Stacking materials can be dangerous due to falling objects or collapsing loads. Safe work practices include:

- Observe height limitations for various materials.
- Conform that stacks are stable and self-supporting.
- Stack cartons and drums on a firm foundation.
- Stack pipe on solid, level racks and block to prevent rolling.
- Stack bags or bundled material in interlocking rows to keep secure.

4.2.20 Excavation Hazards

The Cal/OSHA standards for excavation safety (8 CCR Section 1539 through 1543) must be followed at all times during excavation activities. Excavations include “any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.” This standard applies regardless of the depth of the excavation, although many of the requirements do not apply until personnel enter or the depth exceeds 5-feet. Before excavating, check with local utilities for sewer line, telephone line, water line, natural gas or fuel lines, and electric line locations. Check with the CCL Operations for other buried utilities, piping, and other sub-surface hazards. All contractors performing excavations, must have an excavation safety plan in place and provide the plan to site safety.

4.3 Biological Hazards

Rodents, poisonous insects, snakes, other animals and/or plants are a natural part of any ecosystem. They are sometimes difficult to eliminate or avoid on some landfill sites because those sites are rural and remote. Employees should be aware of the potential for encountering these types of animals and plants. Where possible, nesting places should be removed or access to them should be limited. If several infestations occur, remedies should be discussed with the onsite safety representative. The following could be encountered in performance of the operation, maintenance, and monitoring functions of a project:

4.3.1 *Bees*

Areas known to contain bees will be identified and must be avoided. In particular, Africanized Bees are aggressive and unpredictable. They respond quickly and sting in large numbers; sense threats from people or animals 50 feet or more from the nest; sense vibrations from power equipment 100 feet or more from the nest. Swarms frequently to establish new nests; pursues an enemy 3 miles or more; and nest in small cavities and sheltered areas.

4.3.2 *Snakes*

Rattlesnakes are onsite and are poisonous. Not all rattlesnakes give audible warning before they strike. Extra caution should be taken if tools or other materials are dropped in highly vegetated areas, around rocks, into stockpiles of pipe or other objects, or when walking through highly vegetated areas where visibility (of the ground) is limited. The most active times for rattlesnakes are morning, late afternoon, and early evening; however, encounters could happen at any time of the day. Be aware of areas where snakes may be present. If a snake is identified, do not approach and notify others in the area of the hazard.

4.3.3 *Coyotes*

Coyotes are normally wary of humans and will tend to avoid people at any cost; however, coyote attacks can occur. If you see a coyote in your area but it is keeping its distance and not approaching you, leave the coyote alone and do not approach it. If a coyote does approach, you want to appear as threatening and dangerous as possible. Harass it by yelling, waving your arms, throwing objects, spraying it with water, and/or stomping your feet. Most coyotes will be deterred by this and leave you alone. If it does, then no further action is needed. If a coyote lunges at you, or there was an actual attack, move to safety and notify site safety.

4.3.4 *Mountain Lions*

If you encounter a Mountain Lion, remember the goals are to convince it that you are not prey and that you may be dangerous. Follow these safety tips:

- Do not approach a mountain lion. Most mountain lions will try to avoid a confrontation. Give them a way to escape.
- Do not run from a mountain lion. Running may stimulate a mountain lion's instinct to chase. Instead, stand and face the animal. Make eye contact. If you have small children with you, pick them up if possible so that they don't panic and run. Although it may be awkward, pick them up without bending over or turning away from the mountain lion.
- Do not crouch down or bend over. A human standing up is just not the right shape for a lion's prey. Conversely, a person squatting or bending over resembles a four-legged prey animal.

In mountain lion country, avoid squatting, crouching or bending over, even when picking up children.

- Do all you can to appear larger. Raise your arms. Open your jacket if you are wearing one. Again, pick up small children. Throw stones, branches, or whatever you can reach without crouching or turning your back. Wave your arms slowly and speak firmly in a loud voice. The idea is to convince the mountain lion that you are not prey and that you may be a danger to it.
- Fight back if attacked. A hiker in southern California used a rock to fend off a mountain lion that was attacking his son. Others have fought back successfully with sticks, caps, jackets, garden tools and their bare hands. Since a mountain lion usually tries to bite the head or neck, try to remain standing and face the attacking animal.

5.0 Air Monitoring

ETFL operation area characterization data has been reviewed to determine which hazardous compounds or materials may be present in potentially unsafe concentrations. Monitoring in the ETFL operation areas includes both Time-Weighted Average (TWA) exposure assessment sampling as well as direct reading monitoring equipment and will address both area and personal assessments to evaluate risk potential for the ETFL Operation Area as well as personnel activities. Sampling strategies will be designed for the individual tasks and identified in a sampling and analysis plan. Direct reading monitoring methods will generally be used for the following strategy elements:

- Employee evaluation processes for their own work activities in order to identify or detect changing conditions that may alter exposure potentials.
- Use of direct reading instruments/equipment to survey suspect areas by grab sampling techniques in order to detect changing exposure potential (e.g., variations in concentrations of vapors).
- Use of direct reading instruments/equipment to periodically survey areas by grab sampling techniques in order to detect changing exposure potential due to unrecognized condition changes.
- Use of direct reading instruments/equipment to survey suspect areas by grab sampling techniques in order to establish priorities for TWA sampling.
- Use of direct reading equipment to conduct permit surveys for go/no go determinations (e.g., confined space entry, Hot Work Permits, or emergency response activities).

Integrated (or TWA) sampling will be used for characterizing the average exposure risk over an extended period of time, when concentrations need measured with greater accuracy, or when no direct reading method exists.

5.1 Exposure Monitoring

Personal exposure sampling and monitoring will be done periodically for a given employee activity (as opposed to evaluating an area). Area or personal sampling will conform to EPA, NIOSH, OSHA, Cal/OSHA or other similarly recognized methods when available. Monitoring will be conducted in accordance with the equipment manufacturer's operating instructions. At a minimum, six personal exposure samples will be collected from the worst-case work activities. Sampling and monitoring results will be evaluated against appropriate ACGIH, Cal/OSHA, or US OSHA exposure limits.

Once at least six samples have been collected, the work process may be considered to be characterized. Monitored and sampled compounds include, but are not limited to, those found in Table 2. See the ETFL Operation Area Sampling and Analysis Plan for additional information.

Table 2 Air Sampling Compounds

Parameter	Cal OSHA-PEL	ACGIH TLV	NIOSH IDLH	Site Action Level	Monitoring Equipment
Oxygen (O ₂)	Accepted range = 19.5% to 23.5%	N/A	<19.5%	<19.5% >23.5%	5-gas personal monitor
% Lower Explosive Limit (%LEL)	N/A	N/A	100% of LEL	5%	5-gas personal monitor
Carbon Monoxide (CO)	25 ppm 8-hr TWA 200 ppm CEILING	25 ppm STEL	1,200 ppm	25 ppm	5-gas personal monitor CO Sensor
Hydrogen Sulfide (H ₂ S)	10 ppm 8-hr TWA 15 ppm STEL 20 ppm CEILING 50 ppm PEAK	1 ppm TWA 5 ppm STEL	100 ppm	0.5 ppm	5-gas personal monitor H ₂ S Sensor
Hydrogen	N/A	N/A	40,000 ppm (100% of LEL)	4,000 ppm (10% of LEL)	Hydrogen Analyzer or Gastec Tube Number 30
Hydrogen Peroxide	1 ppm	1 ppm	75 ppm	0.5	Gastec Tube Number 32
Benzene	0.5 ppm 8-hr TWA AL 1 ppm 8-hr TWA 5 ppm STEL	0.02 ppm TWA	500 ppm	0.25 ppm	UltraRAE with Benzene Sep Tube
Tetrahydrofuran	200 ppm 8-hr TWA 250 ppm STEL	50 ppm TWA 100 ppm STEL	2,000 ppm (10% of LEL)	25 ppm	PID/FID with an appropriate correction factor, Gastec Tube number 159, Draeger X-PID
Vinyl Chloride (Chloroethene)	0.5 ppm 8-hr TWA AL 1 ppm 8-hr TWA 5 ppm STEL	1 ppm TWA	N/A	0.25 ppm	PID/FID with an appropriate correction factor, Gastec Tube number 131L, Draeger X-PID
Tetrachloroethylene (Perchloroethylene)	25 ppm 8-hr TWA 100 ppm STEL 300 ppm CEILING	25 ppm TWA 100 ppm STEL	150 ppm	13 ppm	PID/FID with appropriate correction factor, Gastec Tube number 133M, Draeger X-PID
Trichloroethylene	25 ppm 8-hr TWA 100 ppm STEL 300 ppm CEILING	10 ppm TWA 25 ppm STEL	1,000 ppm	5 ppm	PID/FID with appropriate correction factor, Gastec Tube number 132M, Draeger X-PID
Volatile Organic Compounds (VOCs)	N/A	N/A	N/A	25 ppm	5-gas personal monitor

AL: California OSHA Action Level which, if exceeded, requires certain regulatory requirements be met.

PEL: Federal or state OSHA Permissible Exposure Limits are regulatory employee-exposure limits of a toxic material to which an average person in average health may be exposed on a day-to-day basis with no adverse health effects. PELs are based on specified lengths of time, typically 8 hours (see also Ceiling, TWA, and STEL).

TLV: Threshold Limit Values (TLV's) are guidelines (not standards) prepared by the American Conference of Governmental Industrial Hygienists, Inc. (ACGIH), to assist industrial hygienists in making decisions regarding safe levels of exposure to various hazards found in the workplace.

NIOSH IDLH: An atmosphere that is immediately dangerous to life or health (would cause irreversible adverse health effects or would impair an individual's ability to escape from a dangerous atmosphere).

TWA: Time-Weighted Averages are an average concentration over a certain period of time (e.g., 8-hour work period or 40-hour work week).

STEL: Short-Term Exposure Limit is the maximum average chemical concentration in which an employee can be exposed for up to 15 minutes. At no time can the employee exposure concentration exceed the "Ceiling" limit.

Ceiling: The maximum instantaneous chemical concentration in which an employee can be exposed to at any time.

Peak – Permitted to occur once over the course of 10-minutes so long as no other measurable exposure occurs.

%: Percent gas by volume.

% LEL: Percent of the lower explosive limit.

PPM: Parts per million.

Other hazards, not listed above, may also be present. Site management, and workers should continually evaluate their work location and job task for new potential sources of exposure and notify site safety with any questions, concerns, or needs for further exposure evaluation.

5.2 Personal 5-Gas Monitors and Hand-held Monitoring Equipment

As a safety practice, CCL requires workers to wear a personal 5-Gas monitor (e.g., Blackline G7 monitor or equivalent) when they conduct work within the ETLF Operation Area to detect the presence of landfill gas that may be toxic, asphyxiating and/or combustible. Due to the potential for exposure to hazardous atmospheric (airborne) conditions within the ETLF Operation Area and/or the Landfill, air monitoring is conducted by the 5-Gas monitor for oxygen (O₂), hydrogen sulfide (H₂S), carbon monoxide (CO), flammable atmospheres (lower explosive limit, LEL) and a photoionization detector (PID, for hazardous constituents) to protect employee health and safety. As a safety practice, air monitoring must be conducted for each lone worker and/or group using a personal 5-Gas monitor.

The audible alarm warning from the five-gas monitor prompts users to evaluate hazardous conditions that may not otherwise be apparent. When properly set up and used, the alarms within the monitor will sound if any of the values exceed the set points. The alarm will also sound if any of the sensors fail while the monitor is in use. For instructions on how to set alarms, review the manual, contact the manufacturer, or the safety representative in charge of equipment maintenance.

If the instrument low alarm/site action level is exceeded for any of the monitored gasses (O₂, H₂S, CO, LEL, and PID), first immediately egress the area and then evaluate the potential source from a safe location and allow the area to naturally ventilate, alter work practices, or implement engineering controls to reduce exposure below site action levels. Onsite management, including CCL and site safety, must be notified when exposure cannot be maintained below site action levels. Additionally, in the event of an alarm on the PID (Total VOCs), unless a monitor capable of measuring benzene is available, contact site safety to conduct further analysis of the hazard and vapor as VOCs may contain benzene which cannot be accurately measured with a 5-gas meter. For both high and low alarms, monitoring will be performed upon re-entry (upwind if possible) to confirm that concentrations in air are below site action levels. If alteration to work practices or implementation of additional exposure controls are unsuccessful, use of respiratory protection following a written respiratory protection program may be required. Table 3 below provides current set points for hand-held monitoring equipment.

Table 3. Personal 5-Gas Monitor Alarm Set Points

Chemical/ Parameter	Cal OSHA-PEL	ACGIH TLV	NIOSH IDLH	Site Action Level and Low Alarm Set Alarm Set Point)	High Alarm Set	Monitoring Equipment
Oxygen (O ₂)	Accepted range = 19.5% to 23.5%	N/A	<19.5%	<19.5%	>23.5%	5-gas personal monitor O ₂ Sensor
Lower Explosive Limit (LEL)	N/A	N/A	(100% of LEL)	5% of LEL	10% of LEL	5-gas personal monitor LEL Sensor
Carbon Monoxide (CO)	25 ppm 8-hr TWA 200 ppm CEILING	25 ppm STEL	1,200 ppm	25 ppm	100 ppm	5-gas personal monitor CO Sensor
Hydrogen Sulfide (H ₂ S)	10 ppm 8-hr TWA 15 ppm STEL 20 ppm CEILING 50 ppm PEAK	1 ppm TWA 5 ppm STEL	100 ppm	2.5 ppm	5 ppm	5-gas personal monitor H ₂ S Sensor
Benzene	0.5 ppm 8-hr TWA AL 1 ppm 8-hr TWA 5 ppm STEL	0.02 ppm TWA	500 ppm	0.25 ppm	2.5 ppm	UltraRAE with Benzene Sep Tube
Volatile Organic Compounds (VOCs)	N/A	N/A	N/A	25 ppm	50 ppm	5-gas personal monitor PID Sensor

Cal OSHA PEL - California Occupational Safety and Health Administration Permissible Exposure Limits are regulatory employee-exposure limits of a toxic material to which an average person in average health may be exposed on a day-to-day basis with no adverse health effects. PELs are based on specified lengths of time, typically 8 hours (see also Ceiling, TWA, and STEL).

ACGIH TLV - Threshold Limit Values (TLV's) are guidelines (not standards), to assist industrial hygienists in making decisions regarding safe levels of exposure to various hazards found in the workplace.

NIOSH IDLH - Then National Institute of Occupational Safety and Health Immediately Dangerous to Life and Health reflect levels in the atmosphere that are immediately dangerous to life or health (would cause irreversible adverse health effects or would impair an individual's ability to escape from a dangerous atmosphere).

AL: California OSHA Action Level which, if exceeded, requires certain regulatory requirements be met.

TWA - Time-Weighted Averages are an average concentration over a certain period of time (e.g., 8-hour work period or 40-hour work week).

STEL - Short-Term Exposure Limit is the maximum average chemical concentration to which an employee can be exposed for up to 15 minutes. At no time can the employee exposure concentration exceed the "Ceiling" limit.

Ceiling - The maximum instantaneous chemical concentration to which an employee can be exposed at any time.

Peak - Permitted to occur once over the course of 10-minutes so long as no other measurable exposure occurs.

%: Percent gas by volume.

LEL is the lowest concentration of a gas or vapor in air that is capable of producing a flash or fire.

PPM - Parts per million.

6.0 Hazard Analysis and PPE Assessment

A job hazard analysis is required for all work tasks performed at the ETLF Operation Area within the Landfill, to meet the requirements of this HASP. The job hazard analysis is designed to identify steps that involve potential hazards to employees and should be reviewed and understood (and signed to provide evidence of understanding) prior to the performance of any task. If additional steps or hazards are present, the hazard analysis should be revised (and the revision signed by all affected employees) to indicate that these items have been appropriately addressed and are understood before proceeding with the task. A copy of the most recent hazard analysis must be forwarded to the site safety manager and district manager for review and approval. As conditions change, an updated hazard analysis must be provided to the site safety manager prior to starting/resuming work.

For tasks where respiratory protection is required, site safety will verify that a respiratory protection program is in place (including the requirements for medical evaluation and fit testing) and is met, with assistance, as needed, from a Certified Safety Professional and/or Certified Industrial Hygienist.

6.1 Personal Protective Equipment Selection

Personal Protective Equipment (PPE) will be selected on the basis of the hazards to which the workers are exposed or potentially exposed within the ETLF operation area and are part of CCL's overall plan for employee safety. PPE is used as a last resort after hazard elimination, and engineering and administrative controls are addressed. PPE selections will be made with input from site safety, managers, supervisors, and workers. Additional PPE and other safety equipment may be required as set forth in the hazard analysis for a given task. Any downgrading of PPE must be approved by the Landfill safety representative, and if necessary, in collaboration with a Certified Industrial Hygienist.

Whenever practical, PPE will be assigned to individual workers for their exclusive use. Employees will be responsible for the PPE equipment assigned to them or used by them. PPE will be regularly cleaned, inspected, and stored according to instructions given during the training sessions or as directed by supervisors or managers. Defective or damaged PPE shall not be used. Employees must report any defective or damaged equipment to their supervisor for repair or replacement.

The following is the minimum PPE required in ETLF operation areas. Additional PPE and other safety equipment/measures may be required for tasks as set forth in the applicable job hazard assessment or specific plan.

Table 4 PPE Selection Matrix

Location/Task	Standard PPE					Task Specific PPE When Needed Based on JHA									
	Hardhat	Safety Toe Boots	High Visibility Reflective Vest	Safety Glasses with Side Shields	5 Gas Air Monitoring Device	Work Gloves	Hearing Protection	Chemical Goggles	Face Shield	Chemical Gloves	Flame Resistant Clothing	Chemical Body Protection	Chemical Boots	Fall Protection	Respirator
Offices/Non-Operational Areas															
Parking Lots and Traffic Areas			•												
Tank Farms/Leachate Collection															
General Work Area	•	•	•	•	•	•									
Gauging Tanks	•	•	•	•	•	•	•			•	•				•
Chemical Mixing	•	•	•	•	•	•	•	•	•	•	•	•	•		
Liquid Transferring	•	•	•	•	•	•	•	•	•	•	•	•	•		
Tank Inspections	•	•	•	•	•	•				•					
Sampling Tanks	•	•	•	•	•	•	•			•	•				•
Top Deck-Drilling															
Drill Operator	•	•	•	•	•	•	•			•					•
Drill Helper/QA	•	•	•	•	•	•	•			•	•				•
Equipment Operator	•	•	•	•	•	•	•			•					
Well Maintenance	•	•	•	•	•	•	•	•	•	•	•	•	•		•
General Work Area Personnel	•	•	•	•	•	•	•			•					

Hard hats should be compliant with Cal OSHA Title 8 Subchapter 7 Group 2 Article 10 3381.

Safety toe boots should be compliant with Cal OSHA Title 8 Subchapter 7 Group 2 Article 10 3385.

Flame-resistant clothing should be NFPA 2112 and CAT 2 rated.

Protective eye wear should be compliant with Cal OSHA Title 8 Subchapter 7 Group 2 Article 10 3382.

PPE Demarked as Task Specific should be used on a task specific basis as indicated by work plan or job hazard analysis.

Protective gloves should be compliant with Cal OSHA Title 8 Subchapter 7 Group 2 Article 10 3384.

Hearing protection is required to be worn at levels above 85 dBA or excessively loud equipment.

Goggles and face shield will be utilized based on specific tasks.

Compatible gloves include butyl rubber, natural rubber, neoprene, nitrile, and Viton.

Body Protection compatible chemical resistant materials include Tychem 2000 (QC), 4000 (SL), 5000 (CPF3), 6000 (F and FR), 9000 (BR), Responder CSM, 10000 (TK), 10000 FR

Fall protection should be utilized at heights above 4 feet where railings are not available with an approved weight-rated tie-off point.

Full-face supplied-air respirator with an assigned protection factor of 50. Workers should be fit-tested, medically cleared, and trained in accordance with their employer's respiratory protection program. Used for tasks where feasible engineering and administrative controls fail to prevent potentially harmful exposures.

6.2 Safety Boots/Shoes

Safety steel-toed boots/shoes that meet the requirements and specifications of ANSI Z41.1 must be worn while working in field locations. Boots/shoes must be in good repair and laced or fastened. Sandals and tennis-style shoes of any type shall not be worn while working on the Landfill. Chemical safety toed boots are required when there is a potential for chemical contact.

6.3 Safety/Hard Hats

Approved safety hats that meet requirements and specifications established in ANSI Z89.1 must be worn when in the ETLF Operational Areas. This is of particular importance during drilling operations where the potential for flying debris is likely.

Safety hats are not required to be worn in vehicles (passenger cars or trucks) or offices. Safety hats are not required in construction equipment with enclosed cabs. Safety hats must be worn in any construction equipment (i.e., loaders, bobcats, excavators, dump trucks, backhoes, etc.) that do not have enclosed cabs.

6.4 Eye Protection

At a minimum, safety glasses meeting ANSI Z87.1 with side shields must be worn in the field when working in ETLF operation areas. During night operations, clear safety glasses with side shields are required. Safety glasses must be worn by equipment operators, unless eye hazards are adequately controlled by other methods (e.g., enclosed cab) that are reviewed and determined acceptable by the District Manager or site safety representative.

Proper eye protection (goggles, safety glasses, face shield, etc.) must be worn when performing work with a recognized hazard to the eyes, such as wire brushing, hammering, buffing, chipping, grinding, welding, cutting wire rope, or working with rust, dirty chains, and cables, or handling chemicals. If the job could result in injury to the eyes, eye protection is required.

Welding goggles or a welding mask must be worn while helping or working within close range of welders. Goggles and/or face shield must be worn when a splash hazard exists from leachate or other chemical hazard as detailed in the task job hazard analysis.

Eye wash stations must be present in ETLF operation areas where leachate or chemical splash hazards are present. Portable eyewash stations should be inspected as per manufacturer recommendations.

6.5 Hand Protection

Selection of gloves will be based on tasks performed, conditions present, duration of use, and hazards and potential hazards identified. For example, when handling or working with glass bottles, cut and puncture resistant gloves must be used. Contractors working within the ETLF operation areas

will have a variety of gloves available for tasks requiring specific types of gloves (e.g., chemical protective gloves).

6.6 Hearing Protection

A high noise level is defined as an area where noise levels exceed, or may exceed, 85 A-weighted decibels (dBA). Earplugs or earmuffs must be worn in areas with high noise levels. Administrative control consisting of signage will be placed if required.

6.7 Safety Vests

High visibility safety vests, shirts or jackets are required anytime personnel are working on the Landfill and within the ETLF operation areas. This requirement also applies to equipment operators whose duties involve leaving the cab of their equipment and working in the ETLF Operation Area.

6.8 Clothing

- Long pants must be worn. Pants must cover the work boot top.
- Ragged clothing shall not be worn.

7.0 Training

Each contractor and their employees will only perform tasks that they have been properly trained to perform. A copy of each employee's training record must be available in the contractor's office and made available to the Landfill management and site safety as requested.

7.1 Hazardous Waste Operations and Emergency Response

All workers within ETLF operation areas must receive *Hazardous Waste Operations and Emergency Response* training consistent with [8 C.C.R. § 5192](#). This includes, but is not limited, to equipment operators, general laborers, and others exposed to hazardous substances, health hazards, or safety hazards, and their supervisors and management responsible for the operation area. These workers will meet the training requirements prescribed in [8 C.C.R. § 5192](#) that are commensurate with their involvement.

7.2 Chemical Hazard Communication

7.2.1 Identified Chemicals

All workers must receive training on identified chemical hazards they may encounter during their work when first assigned to a new area or task and as new chemical hazards are identified. The training for each chemical hazard must meet the requirements outlined in [8 CCR § 5194\(h\) – Hazard Communication Employee Information and Training](#). Chemicals workers may be exposed to depending on work area include, but are not limited to, those in Section 4.1.

7.2.2 Benzene

In addition to the training requirements in Section 7.0, All ETLF Operations workers must be provided with information and receive training on the hazards of benzene which meets the requirements of [8 CCR § 5218\(j\)\(3\)](#). Each worker who is potentially exposed above the action level must receive this information and training annually.

7.3 Personal Protective Equipment

Each employee who is required to use PPE or to implement any other established hazard control within the ETLF Operation Area will be trained in the following:

- Why and when PPE and hazard controls are necessary.
- What PPE is necessary and any alternative choices of equipment or hazard control.
- How to properly don, doff, adjust, and wear PPE and the use of other selected hazard control measures,
- The limitations of the PPE, and the proper care, maintenance, storage, useful life, and disposal of PPE/hazard controls and applicable safety equipment provided.

Training will typically be conducted by the contractors working in the ETLF Operation Area and will include an opportunity for employees to handle PPE or other hazard control measures. Each affected employee must demonstrate that they understand the training and are able to use the PPE/hazard control properly. The training will be documented through a written certification; the documentation will include the names of each employee trained, the date(s) of the training, and the subject matter covered.

If an employee who has been trained demonstrates a lack of knowledge or behavior that leads the supervisor to believe the employee does not fully understand the PPE/hazard control involved, that employee will be retrained. If there are changes within the ETLF Operation Area workplace or processes that change the exposures or types of PPE/hazard control to be used, affected employees will be retrained.

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8.0 Acknowledgement Page

CCL project team members who are performing work on the project and site must review, understand and comply with this plan before undertaking work. This plan must be available to employees for review, and a copy must be present at the site. CCL contractors must also review, understand, and comply with this plan. Review of this plan by each worker must be documented using the following form, or other method of documentation.

“I have read the attached Health and Safety Plan for the ETLF Operation Area. I have discussed any questions and/or concerns that I have regarding the contents of this document with the designated CCL project safety representative, I understand its purpose and requirements, and consent to adhere to its policies, procedures and guidelines.”

Name	Signature	Company	Date

Appendix A: Amendments to Safety and Health Plan

Appendix A: Amendments to the Health and Safety Plan

Version 1.0		
Description of Change (include sections):		
<i>Initial version of plan.</i>		
Name/Position		Date
Prepared By:	Jason Callahan – Senior Health Scientist	3/15/2024

Version 1.1		
Description of Change (include sections):		
Added <i>Appendix D: Job Hazard Assessments. Formatted plan style.</i>		
Name/Position		Date
Prepared By:	Jason Callahan – Senior Health Scientist	4/17/2024

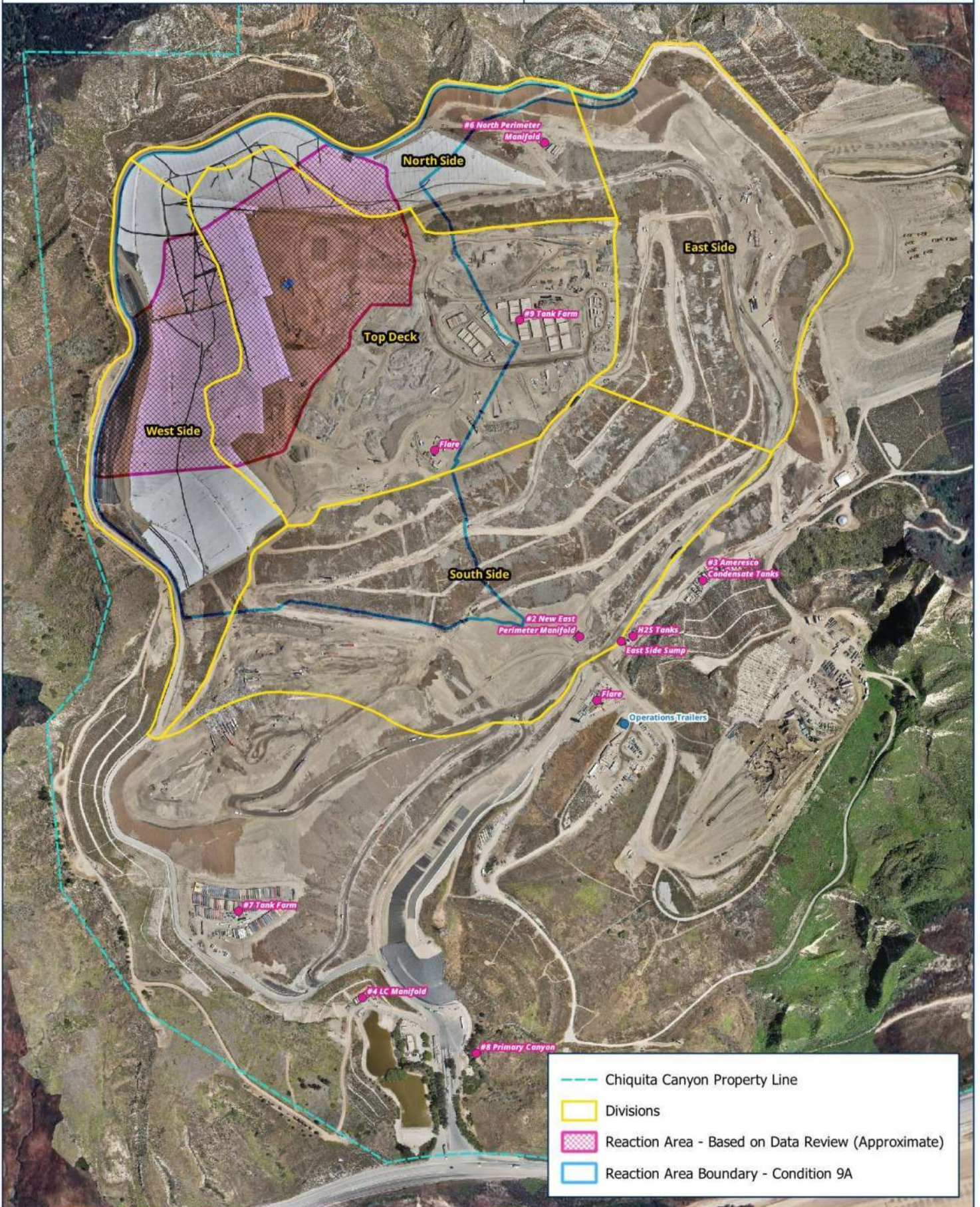
Version 2.0		
Description of Change (include sections):		
Added <i>Section 4.1.1 on Unidentified Chemicals</i> <i>Section 4.1.6 on Benzene</i> <i>Section 4.1.7 on 1,4-dioxane</i> <i>Section 4.1.9 on VOCs</i> <i>Section 4.1.10 on Caustic solutions of sodium hydroxide</i> <i>Section 7.2 on Chemical Hazard Communication</i>		
Updated <i>Section 3.0 to contain description of emergency horn signals and their actions.</i> <i>Section 4.1.5 to include additional information on H₂S.</i> <i>Section 4.1.8 to no longer state a Leachate SDS does not exist.</i> <i>Section 4.1.9 on hydrogen peroxide to section 4.1.8</i> <i>Section 4.2.5 on weather for clarity and style.</i> <i>Section 4.2.6 to provide additional guidance for heat illness prevention.</i> <i>Section 4.2.12 language regarding housekeeping to use "will" instead of "should."</i> <i>Section 4.3.1 to more broadly references bees instead of just Africanized Bees.</i> <i>Section 5.2 on personal 5-gas monitors to clarify actions for site action level exceedances.</i> <i>Section 7.2 on PPE to Section 7.3</i> <i>Section 8 on Acknowledgements to allow for use of other forms of documentation.</i> <i>Table 4 to clarify that certain PPE is task specific.</i>		
Removed <i>Section 3.0 Requirement for decontamination during evacuation was overly broad.</i>		

Version 2.0		
<p>Section 4.1.8 on oxidizers</p> <p>Section 4.1.9 on Talon</p> <p>Section 4.1.10 on Talon Concentrate</p> <p>Section 4.1.11 on corrosives</p> <p>Section 4.2.12 Blanket requirement for FRC conflicts with FRC requirement based on JHA. Removed redundant prohibition on smoking.</p>		
Name/Position		Date
Prepared By:	Jason Callahan – Senior Health Scientist	6/28/2024

Version 2.1		
Description of Change (include sections):		
<p>Updated</p> <p>Section 4.2.6 to provide additional guidance for heat illness prevention.</p> <p>Section 5.2 to clarify site action levels and instrument alarm set points.</p> <p>Cover page and Table 1 names.</p>		
Name/Position		Date
Prepared By:	Jason Callahan – Senior Health Scientist	7/2/2024

Version 2.2		
Description of Change (include sections):		
<p>Updated</p> <p>H2S site action level updated from 0.5 to 2.5 ppm and %LEL site action level updated from 1% to 5% and CO from 13 ppm to 25 ppm.</p>		
Name/Position		Date
Prepared By:	Jason Callahan – Senior Health Scientist	8/14/2024

Appendix B: ETLF Operation Area Map



Appendix C: Safety Data Sheets

Inspection

SECTION 1: IDENTIFICATION

1.1 Product Identifier

Product Form

Aqueous Solution

Product Name

Landfill Leachate - East Perimeter

Synonyms

Landfill Leachate
Landfill Wastewater

1.2 Intended Use of the Product

Use of the substance/mixture

None

1.3 Name, Address, and Telephone of the Responsible Party/Company

Chiquita Canyon Landfill
29201 Henry Mayo Dr
Castaic, CA 91384
USA
Phone number: (661) 257-3655

Emergency Telephone Number

Steve Cassulo 661-371-9214
Nicole Ward 661-425-4619
IF MEDICAL EMERGENCY, DIAL 911

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the Substance or Mixture (GHS-US Classification)

Skin irritation (Category 2), H313
Combustible Liquid (Category 4), H227
Hazard Not Otherwise Classified (HNOC)
For the full text of the Hazard Statements mentioned in this Section, see Section 16.

2.2 Label Elements (GHS-US Labeling)

Hazard Pictograms (GHS-US)



Photo 1

Signal Word (GHS-US)

WARNING

Hazard Statements (GHS-US)

H227 Combustible Liquid
H303 May be Harmful if swallowed.
H313 May be harmful in contact with skin.
H333 May be Harmful if inhaled.
Hazard Not Otherwise Classified (HNOC).

Precautionary Statements (GHS-US)

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.
P220 Keep away from clothing and other combustible materials
P262 Do not get in eyes, on skin, or on clothing .
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink, or smoke while using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection, face protection.
P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.
P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
P353 Rise skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other Hazards

May cause eye irritation.

2.4 Unknown Acute Toxicity (GHS-US)

None

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Landfill Leachate, Landfill Wastewater

3.2 Mixture (Include percentage of components)

No chemicals in excess of 0.1% have been detected. If leachate exhibits a change in characteristics described in Section 9, contact a supervisor and reevaluate PPE. Below table shows the detected compounds from analytical lab testing and the % of each detected compound (percent by weight assuming 1 liter of solution weighs 1000 grams):

Antimony: 0.0000097 - 0.000093 %
Arsenic: 0.00003 - 0.000085 %
Barium: 0.00012 - 0.00028 %

Chromium: 0.000027 - 0.000042 %
Cobalt: 0.0000018 - 0.0000054 %
Lead: 0.0000039 - 0.0000097 %
Molybdenum: 0.0000042 - 0.0000085 %
Nickel: 0.000013 - 0.000023 %
Vanadium: 0.000011 - 0.000015 %
Zinc: 0.00033 - 0.00051 %
Mercury: 0.0000029 - 0.000021 %
1, 4-Dichlorobenzene: 0.000002 - 0.00003 %
2-Butanone: 0.0087-0.0160 %
Benzene: 0.00006 - 0.00015 %
2-Methylphenol: 0.00004 - 0.00017 %
3-,4-Methylphenol: 0.0011 - 0.0032 %
Pyridine: 0.000082 - 0.00025 %

These compounds are assumed to be present in trace amounts in the leachate: Copper, Selenium, 1,2-Dichloroethane, Chlorobenzene. Analytical testing did not confirm detection of the analytes across all samples tested.

Component (include percentage & GHS-US classification)

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1 Description of First-aid Measures

Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact, wash off with soap and plenty of water. Consult a physician.

In case of eye contact, rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to medical treatment.

4.2 Most Important Symptoms and Effects Both Acute and Delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

Suitable extinguishing media.

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special Hazards Arising From the Substance or Mixture

No data available.

5.3 Advice for Firefighters

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Use personal protective equipment (see section 8.2.2). Avoid becoming contaminated; do not touch your face or body; do not smoke, eat, or drink unless you have washed your hands and face thoroughly with soap and water; clean all exposed wounds, however small, and cover with a sterile, waterproof dressing; change out of contaminated clothing before eating, drinking, or smoking. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. If skin contact occurs, wash thoroughly with soap and water.

6.1.1 For Non-Emergency Personnel

See section 6.1.

6.1.2 For Emergency Personnel

See section 6.1 and section 8.2 for proper PPE requirements for any clean up of spills.

6.2 Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and Materials for Containment and Cleaning Up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed and labeled containers for disposal. Don proper PPE as described in section 8.2.

6.4 Reference to Other Sections

For disposal see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for Safe Handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. For precautions see section 2.2.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

Keep container closed in a well-ventilated space.

7.3 Specific End Use(s)

None.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at

the end of the workday.

8.2.2 Personal Protective Equipment (PPE)

Avoid dermal (skin) contact with leachate by using appropriate chemical-resistant gloves, boots, and/or body protection constructed from a material that is fire resistant and has a chemical permeation time sufficient to prevent dermal contact during the task. Benzene will permeate PPE constructed of nitrile, butyl rubber, and neoprene in less than one hour and should be removed and replaced if contaminated. Cloth, leather, and other glove materials that do not afford any chemical protection cannot be used for connecting/disconnecting transfer lines or other tasks where sufficient leachate contact may occur to permeate the glove material. For work tasks requiring extended contact with leachate (>1 hr.), chemical protective clothing such as Tychem 6000 FR must be worn. Chemical protective boots must be worn if required to walk through spilled or pooled leachate. To prevent dermal absorption, non-chemical protective clothing which has become contaminated with leachate should not be worn and may need to be discarded depending on the amount of contamination.

Due to the potential presence of flammable liquids and vapors, fire resistant clothing must be worn when conducting leachate transfers, working near open tank hatches, and when in the vicinity of spilled leachate, seeps, and other exposed leachate sources.

When conducting transfer of leachate by hose or other method where splash or spray hazard is present, a face shield must be worn at minimum. If transfer hoses were under sufficient pressure during transfer that an improperly depressurized line, or line failure, could result in heavy soaking spray face shield and/or goggles must be worn during line disconnect. If an overhead hazard exists (e.g., transferring from an elevated container) goggles must be worn with face shield.

Include photos or pictograms of PPEs

8.2.3 Materials for Protective Clothing

Eye/face protection: Safety glasses with side shields or safety goggles worn at all times. If conducting a leachate transfer, safety face shield also must be worn. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH or EN 166.

Skin protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws. Wash and dry hands. Use Nitrile Rubber gloves, minimum layer thickness 0.2mm with break through time of 60 min. IF GLOVES BECOME CONTAMINATED, REMOVE AND REPLACE.

Body protection: Full Tychem 6000 FR chemical protective clothing suit plus chemical resistant boots.

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi- purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH.

8.2.4 Environmental Exposure Controls

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

8.2.5 Other Information

OSHA PEL for reliably detected Chemicals in Material:

Antimony: .5 mg/m³ 8 hour TWA

Arsenic: 0.01 mg/m³ 8 hour TWA

Barium: 0.5 mg/m³ 8 hour TWA

Chromium: 1 mg/m³ 8 hour TWA

Cobalt: 0.02 mg/m³ 8 hour TWA

Lead: 0.05 mg/m³ 8 hour TWA

Molybdenum: 0.5 mg/m³ 8 hour TWA

Nickel: 0.5 mg/m³ 8 hour TWA
Vanadium: 0.05 mg/m³ 8 hour TWA
Zinc: 10 mg/m³ 8 hour TWA
Mercury: 0.1 mg/m³ 8 hour TWA
1, 4-Dichlorobenzene: 75 ppm 8 hour TWA
2-Butanone: 200 ppm 8 hour TWA
Benzene: 1 ppm 8 hour TWA
2-Methyphenol: 5 ppm 8 hour TWA
3-,4-Methylphenol: 5 ppm 8 hour TWA
Pyridine: 5 ppm 8 hour TWA

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

Physical State

Liquid

Appearance

Clear/colorless to light brown

Odor

Light Leachate odor

pH

5.54-6.05

Evaporation Rate

Similar to water.

Melting Point

Similar but likely above water.

Freezing Point

Similar but likely below water.

Boiling Point

No data available.

Flash Point

180 deg F.

9.2 Other Information

No other data available.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Potentially reactive with strong acids or strong oxidizers.

10.2 Chemical Stability

Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions

No data available.

10.4 Conditions to Avoid

No data available.

10.5 Incompatible Materials

No data available. Do not mix Leachate with any other materials.

10.6 Hazardous Decomposition Products

Hazardous decomposition products formed under fire conditions. - Nitrogen oxides, Sulfur Oxides (SO_x), (NO_x) Other decomposition products – Under acidic conditions – Hydrogen Sulfide (H₂S), Basic conditions- Ammonia (NH₃)

In the event of fire: see section 5

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

Acute toxicity: Leachate may contain waterborne pathogens that could cause infections and disease.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation: No data available

Serious eye damage/eye irritation: No data available

Respiratory or skin sensitization: No data available

Germ cell mutagenicity: No data available

Carcinogenicity

IARC: No known component of this material present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No known component of this material present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No known component of this material present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Note that the material does contain carcinogenic components, but not at sufficient percentages for the material itself to be classified as carcinogenic.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

T22 Fish Toxicity Test - No fatalities.

12.2 Persistence and Degradability

No data available.

12.3 Bioaccumulative Potential

No data available.

12.4 Mobility in Soil

No data available.

12.5 Other Adverse Effects

An environmental hazard cannot be excluded in the event of improper handling or disposal.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Provide wastewater treatment in a licensed facility.

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT

Proper Shipping Name

Combustible liquid, n.o.s.

Hazard Class

Comb. liq

Identification Number

NA1993

Label Codes

None

Packing Group

III

ERG Number

128

14.2 In Accordance with IMDG

Proper Shipping Name

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

EmS-No. (Fire)

NA - Only ship by ground transportation.

EmS-No. (Spillage) S-C

NA - Only ship by ground transportation.

MFAG Number

NA - Only ship by ground transportation.

14.3 In Accordance with IATA

Proper Shipping Name

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

No components are subject to reporting levels established by SARA Title III, Section 313.

SARA 311/312

If reporting thresholds are exceeded.

15.2 US State Regulations

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Other Information

Revision Date: Rev 1, 3/18/2024

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HMIS Rating

Health hazard: 1

Flammability: 2

Physical Hazard 0

NFPA Rating

Health hazard: 1

Fire Hazard: 2

Reactivity Hazard: 0

GHS Full Text Phrases

H227 Combustible Liquid.

H303 May be harmful if swallowed.

H313 May be harmful in contact with skin.

H333 May be harmful if inhaled.

Hazard Not Otherwise Classified (HNOC).

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.

P220 Keep away from clothing and other combustible materials

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink, or smoke while using this product.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves, protective clothing, eye protection, face protection.
P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.
P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
P353 Rinse skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Disclaimer:

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Media summary



Photo 1

Inspection

SECTION 1: IDENTIFICATION

1.1 Product Identifier

Product Form

Aqueous Solution

Product Name

Landfill Leachate - LC Manifold

Synonyms

Landfill Leachate
Landfill Wastewater

1.2 Intended Use of the Product

Use of the substance/mixture

None

1.3 Name, Address, and Telephone of the Responsible Party/Company

Chiquita Canyon Landfill
29201 Henry Mayo Dr
Castaic, CA 91384
USA
Phone number: (661) 257-3655

Emergency Telephone Number

Steve Cassulo 661-371-9214
Nicole Ward 661-425-4619
IF MEDICAL EMERGENCY, DIAL 911

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the Substance or Mixture (GHS-US Classification)

Skin irritation (Category 2), H313
Combustible Liquid (Category 4), H227
Hazard Not Otherwise Classified (HNOC)
For the full text of the Hazard Statements mentioned in this Section, see Section 16.

2.2 Label Elements (GHS-US Labeling)

Hazard Pictograms (GHS-US)



Photo 1

Signal Word (GHS-US)

WARNING

Hazard Statements (GHS-US)

H227 Combustible Liquid
H303 May be Harmful if swallowed.
H313 May be harmful in contact with skin.
H333 May be Harmful if inhaled.
Hazard Not Otherwise Classified (HNOC).

Precautionary Statements (GHS-US)

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.
P220 Keep away from clothing and other combustible materials
P262 Do not get in eyes, on skin, or on clothing .
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink, or smoke while using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection, face protection.
P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.
P301+P330+P331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
P353 Rise skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other Hazards

May cause eye irritation.

2.4 Unknown Acute Toxicity (GHS-US)

None

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Landfill Leachate, Landfill Wastewater

3.2 Mixture (Include percentage of components)

No chemicals in excess of 0.1% have been detected. If leachate exhibits a change in characteristics described in Section 9, contact a supervisor and reevaluate PPE. Below table shows the detected compounds from analytical lab testing and the % of each detected compound (percent by weight assuming 1 liter of solution weighs 1000 grams):

Antimony: 0.0000076 - 0.000026 %
Arsenic: 0.000021 - 0.000053 %
Barium: 0.00033 - 0.00046 %

Chromium: 0.000021 - 0.000029 %
Cobalt: 0.0000029 - 0.0000067 %
Copper: 0.0000024 - 0.0000079 %
Molybdenum: 0.0000039 - 0.0000097 %
Nickel: 0.000032 - 0.000065 %
Vanadium: 0.000044 - 0.000057 %
Zinc: 0.0000079 - 0.000061 %
1, 4-Dichlorobenzene: 0.000001 - 0.000003 %
2-Butanone: 0.00012-0.0024 %
Benzene: 0.0000008 - 0.000004 %
2-Methylphenol: 0.000018 - 0.00071 %
3-,4-Methylphenol: 0.00002 - 0.00039 %
Pyridine: 0.000024 - 0.000082 %

These compounds are assumed to be present in trace amounts in the leachate: Lead, Selenium, Mercury, Chloroform. Analytical testing did not confirm detection of the analytes across all samples tested.

Component (include percentage & GHS-US classification)

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1 Description of First-aid Measures

Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact, wash off with soap and plenty of water. Consult a physician.

In case of eye contact, rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to medical treatment.

4.2 Most Important Symptoms and Effects Both Acute and Delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

Suitable extinguishing media.

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special Hazards Arising From the Substance or Mixture

No data available.

5.3 Advice for Firefighters

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Use personal protective equipment (see section 8.2.2). Avoid becoming contaminated; do not touch your face or body; do not smoke, eat, or drink unless you have washed your hands and face thoroughly with soap and water; clean all exposed wounds, however small, and cover with a sterile, waterproof dressing; change out of contaminated clothing before eating, drinking, or smoking. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. If skin contact occurs, wash thoroughly with soap and water.

6.1.1 For Non-Emergency Personnel

See section 6.1.

6.1.2 For Emergency Personnel

See section 6.1 and section 8.2 for proper PPE requirements for any clean up of spills.

6.2 Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and Materials for Containment and Cleaning Up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed and labeled containers for disposal. Don proper PPE as described in section 8.2.

6.4 Reference to Other Sections

For disposal see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for Safe Handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. For precautions see section 2.2.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

Keep container closed in a well-ventilated space.

7.3 Specific End Use(s)

None.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday.

8.2.2 Personal Protective Equipment (PPE)

Avoid dermal (skin) contact with leachate by using appropriate chemical-resistant gloves, boots, and/or body protection constructed from a material that is fire resistant and has a chemical permeation time sufficient to prevent dermal contact during the task. Benzene will permeate PPE constructed of nitrile, butyl rubber, and neoprene in less than one hour and should be removed and replaced if contaminated. Cloth, leather, and other glove materials that do not afford any chemical protection cannot be used for connecting/disconnecting transfer lines or other tasks where sufficient leachate contact may occur to permeate the glove material. For work tasks requiring extended contact with leachate (>1 hr.), chemical protective clothing such as Tychem 6000 FR must be worn. Chemical protective boots must be worn if required to walk through spilled or pooled leachate. To prevent dermal absorption, non-chemical protective clothing which has become contaminated with leachate should not be worn and may need to be discarded depending on the amount of contamination.

Due to the potential presence of flammable liquids and vapors, fire resistant clothing must be worn when conducting leachate transfers, working near open tank hatches, and when in the vicinity of spilled leachate, seeps, and other exposed leachate sources.

When conducting transfer of leachate by hose or other method where splash or spray hazard is present, a face shield must be worn at minimum. If transfer hoses were under sufficient pressure during transfer that an improperly depressurized line, or line failure, could result in heavy soaking spray face shield and/or goggles must be worn during line disconnect. If an overhead hazard exists (e.g., transferring from an elevated container) goggles must be worn with face shield.

Include photos or pictograms of PPEs

8.2.3 Materials for Protective Clothing

Eye/face protection: Safety glasses with side shields or safety goggles worn at all times. If conducting a leachate transfer, safety face shield also must be worn. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH or EN 166.

Skin protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws. Wash and dry hands. Use Nitrile Rubber gloves, minimum layer thickness 0.2mm with break through time of 60 min. IF GLOVES BECOME CONTAMINATED, REMOVE AND REPLACE.

Body protection: Full Tychem 6000 FR chemical protective clothing suit plus chemical resistant boots.

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi- purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH.

8.2.4 Environmental Exposure Controls

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

8.2.5 Other Information

OSHA PEL for reliably detected Chemicals in Material:

Antimony: 0.5 mg/m³ 8 hour TWA

Arsenic: 0.01 mg/m³ 8 hour TWA

Barium: 0.5 mg/m³ 8 hour TWA

Chromium: 1 mg/m³ 8 hour TWA

Cobalt: 0.02 mg/m³ 8 hour TWA

Copper: 1 mg/m³ 8 hour TWA

Molybdenum: 0.5 mg/m³ 8 hour TWA

Nickel: 0.5 mg/m³ 8 hour TWA

Vanadium: 0.05 mg/m³ 8 hour TWA

Zinc: 10 mg/m³ 8 hour TWA

1, 4-Dichlorobenzene: 75 PPM 8 hour TWA
2-Butanone: 200 ppm 8 hour TWA
Benzene: 1 ppm 8 hour TWA
2-Methyphenol: 5 ppm 8 hour TWA
3-,4-Methylphenol: 5 ppm 8 hour TWA
Pyridine: 5 ppm 8 hour TWA

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

Physical State

Liquid

Appearance

Clear/colorless to light brown

Odor

Light Leachate odor

pH

7.04-7.73

Evaporation Rate

Similar to water.

Melting Point

Similar but likely above water.

Freezing Point

Similar but likely below water.

Boiling Point

No data available.

Flash Point

158 deg F.

9.2 Other Information

No other data available.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Potentially reactive with strong acids or strong oxidizers.

10.2 Chemical Stability

Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions

No data available.

10.4 Conditions to Avoid

No data available.

10.5 Incompatible Materials

No data available. Do not mix Leachate with any other materials.

10.6 Hazardous Decomposition Products

Hazardous decomposition products formed under fire conditions. - Nitrogen oxides, Sulfur Oxides (SO_x), (NO_x) Other decomposition products – Under acidic conditions – Hydrogen Sulfide (H₂S), Basic conditions- Ammonia (NH₃)

In the event of fire: see section 5

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

Acute toxicity: Leachate may contain waterborne pathogens that could cause infections and disease.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation: No data available

Serious eye damage/eye irritation: No data available

Respiratory or skin sensitization: No data available

Germ cell mutagenicity: No data available

Carcinogenicity

IARC: No known component of this material present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No known component of this material present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No known component of this material present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Note that the material does contain carcinogenic components, but not at sufficient percentages for the material itself to be classified as carcinogenic.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

T22 Fish Toxicity Test - No fatalities.

12.2 Persistence and Degradability

No data available.

12.3 Bioaccumulative Potential

No data available.

12.4 Mobility in Soil

No data available.

12.5 Other Adverse Effects

An environmental hazard cannot be excluded in the event of improper handling or disposal.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Provide wastewater treatment in a licensed facility.

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT

Proper Shipping Name

Combustible liquid, n.o.s.

Hazard Class

Comb. liq

Identification Number

NA1993

Label Codes

None

Packing Group

III

ERG Number

128

14.2 In Accordance with IMDG

Proper Shipping Name

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

EmS-No. (Fire)

NA - Only ship by ground transportation.

EmS-No. (Spillage) S-C

NA - Only ship by ground transportation.

MFAG Number

NA - Only ship by ground transportation.

14.3 In Accordance with IATA

Proper Shipping Name

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

No components are subject to reporting levels established by SARA Title III, Section 313.

SARA 311/312

If reporting thresholds are exceeded.

15.2 US State Regulations

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Other Information

Revision Date: Rev 1, 3/18/2024

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HMIS Rating

Health hazard: 1

Flammability: 2

Physical Hazard 0

NFPA Rating

Health hazard: 1

Fire Hazard: 2

Reactivity Hazard: 0

GHS Full Text Phrases

H227 Combustible Liquid.

H303 May be harmful if swallowed.

H313 May be harmful in contact with skin.

H333 May be harmful if inhaled.

Hazard Not Otherwise Classified (HNOC).

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.

P220 Keep away from clothing and other combustible materials

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink, or smoke while using this product.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves, protective clothing, eye protection, face protection.

P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.

P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.

P353 Rise skin with water/shower.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Disclaimer:

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Media summary



Photo 1

Inspection

SECTION 1: IDENTIFICATION

1.1 Product Identifier

Product Form

Aqueous Solution

Product Name

Landfill Leachate - North Perimeter

Synonyms

Landfill Leachate
Landfill Wastewater

1.2 Intended Use of the Product

Use of the substance/mixture

None

1.3 Name, Address, and Telephone of the Responsible Party/Company

Chiquita Canyon Landfill
29201 Henry Mayo Dr
Castaic, CA 91384
USA
Phone number: (661) 257-3655

Emergency Telephone Number

Steve Cassulo 661-371-9214
Nicole Ward 661-425-4619
IF MEDICAL EMERGENCY, DIAL 911

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the Substance or Mixture (GHS-US Classification)

Skin irritation (Category 2), H313
Flammable Liquid and Vapor (Category 3), H226
Hazard Not Otherwise Classified (HNOC)
For the full text of the Hazard Statements mentioned in this Section, see Section 16.

2.2 Label Elements (GHS-US Labeling)

Hazard Pictograms (GHS-US)



Photo 1



Photo 2

Signal Word (GHS-US)

WARNING

Hazard Statements (GHS-US)

H226 Flammable Liquid and Vapor.
H303 May be harmful if swallowed.
H313 May be harmful in contact with skin.
H333 May be Harmful if inhaled.
Hazard Not Otherwise Classified (HNOC).

Precautionary Statements (GHS-US)

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.
P220 Keep away from clothing and other combustible materials
P262 Do not get in eyes, on skin, or on clothing .
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink, or smoke while using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection, face protection.
P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.
P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
P353 Rise skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other Hazards

May cause eye irritation.

2.4 Unknown Acute Toxicity (GHS-US)

None

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Landfill Leachate, Landfill Wastewater

3.2 Mixture (Include percentage of components)

No chemicals in excess of 0.1% have been detected. If leachate exhibits a change in characteristics described in Section 9, contact a supervisor and reevaluate PPE. Below table shows the detected compounds from analytical lab testing and the % of each detected compound (percent by weight assuming 1 liter of solution weighs 1000 grams):

Antimony: 0.0000048 - 0.00007 %
Arsenic: 0.0000056 - 0.00004 %
Barium: 0.00018 - 0.00048 %

Chromium: 0.000022 - 0.000062 %
Cobalt: 0.0000023 - 0.0000056 %
Copper: 0.000002 - 0.000019 %
Nickel: 0.0000051 - 0.000021 %
Vanadium: 0.000009 - 0.000029 %
Zinc: 0.0000085 - 0.002 %
1,4-Dichlorobenzene: 0.0000009 - 0.000004 %
2-Butanone: 0.0017 - 0.0086 %
Benzene: 0.00004 - 0.00027 %
3-,4-Methylphenol: 0.00096 - 0.0022 %
Pyridine: 0.000015 - 0.00052 %

These compounds are assumed to be present in trace amounts in the leachate: Lead, Molybdenum, Selenium, Silver, Chlorobenzene, Tetrachloroethene, 2-Methylphenol. Analytical testing did not confirm detection of the analytes across all samples tested.

Component (include percentage & GHS-US classification)

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1 Description of First-aid Measures

Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact, wash off with soap and plenty of water. Consult a physician.

In case of eye contact, rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to medical treatment.

4.2 Most Important Symptoms and Effects Both Acute and Delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

Suitable extinguishing media.

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special Hazards Arising From the Substance or Mixture

No data available.

5.3 Advice for Firefighters

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Use personal protective equipment (see section 8.2.2). Avoid becoming contaminated; do not touch your face or body; do not smoke, eat, or drink unless you have washed your hands and face thoroughly with soap and water; clean all exposed wounds, however small, and cover with a sterile, waterproof dressing; change out of contaminated clothing before eating, drinking, or smoking. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. If skin contact occurs, wash thoroughly with soap and water.

6.1.1 For Non-Emergency Personnel

See section 6.1.

6.1.2 For Emergency Personnel

See section 6.1 and section 8.2 for proper PPE requirements for any clean up of spills.

6.2 Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and Materials for Containment and Cleaning Up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed and labeled containers for disposal. Don proper PPE as described in section 8.2.

6.4 Reference to Other Sections

For disposal see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for Safe Handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. For precautions see section 2.2.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

Keep container closed in a well-ventilated space.

7.3 Specific End Use(s)

None.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday.

8.2.2 Personal Protective Equipment (PPE)

Avoid dermal (skin) contact with leachate by using appropriate chemical-resistant gloves, boots, and/or body protection constructed from a material that is fire resistant and has a chemical permeation time sufficient to prevent dermal contact during the task. Benzene will permeate PPE constructed of nitrile, butyl rubber, and neoprene in less than one hour and should be removed and replaced if contaminated. Cloth, leather, and other glove materials that do not afford any chemical protection cannot be used for connecting/disconnecting transfer lines or other tasks where sufficient leachate contact may occur to permeate the glove material. For work tasks requiring extended contact with leachate (>1 hr.), chemical protective clothing such as Tychem 6000 FR must be worn. Chemical protective boots must be worn if required to walk through spilled or pooled leachate. To prevent dermal absorption, non-chemical protective clothing which has become contaminated with leachate should not be worn and may need to be discarded depending on the amount of contamination.

Due to the potential presence of flammable liquids and vapors, fire resistant clothing must be worn when conducting leachate transfers, working near open tank hatches, and when in the vicinity of spilled leachate, seeps, and other exposed leachate sources.

When conducting transfer of leachate by hose or other method where splash or spray hazard is present, a face shield must be worn at minimum. If transfer hoses were under sufficient pressure during transfer that an improperly depressurized line, or line failure, could result in heavy soaking spray face shield and/or goggles must be worn during line disconnect. If an overhead hazard exists (e.g., transferring from an elevated container) goggles must be worn with face shield.

Include photos or pictograms of PPEs

8.2.3 Materials for Protective Clothing

Eye/face protection: Safety glasses with side shields or safety goggles worn at all times. If conducting a leachate transfer, safety face shield also must be worn. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH or EN 166.

Skin protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws. Wash and dry hands. Use Nitrile Rubber gloves, minimum layer thickness 0.2mm with break through time of 60 min. IF GLOVES BECOME CONTAMINATED, REMOVE AND REPLACE.

Body protection: Full Tychem 6000 FR chemical protective clothing suit plus chemical resistant boots.

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi- purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH.

8.2.4 Environmental Exposure Controls

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

8.2.5 Other Information

OSHA PEL for reliably detected Chemicals in Material:

Antimony: 0.5 mg/m³ 8 hour TWA

Arsenic: 0.01 mg/m³ 8 hour TWA

Barium: 0.5 mg/m³ 8 hour TWA

Chromium: 1 mg/m³ 8 hour TWA

Cobalt: 0.02 mg/m³ 8 hour TWA

Copper: 1 mg/m³ 8 hour TWA

Nickel: 0.5 mg/m³ 8 hour TWA

Vanadium: 0.05 mg/m³ 8 hour TWA

Zinc: 10 mg/m³ 8 hour TWA

1,4-Dichlorobenzene: 75 ppm 8 hour TWA

2-Butanone: 200 ppm 8 hour TWA
Benzene: 1 ppm 8 hour TWA
3-,4-Methylphenol: 5 ppm 8 hour TWA
Pyridine: 5 ppm 8 hour TWA

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

Physical State

Liquid

Appearance

Clear/colorless to light brown

Odor

Light Leachate odor

pH

5.58-6.20

Evaporation Rate

Similar to water.

Melting Point

Similar but likely above water.

Freezing Point

Similar but likely below water.

Boiling Point

No data available.

Flash Point

124 deg F.

9.2 Other Information

No other data available.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Potentially reactive with strong acids or strong oxidizers.

10.2 Chemical Stability

Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions

No data available.

10.4 Conditions to Avoid

No data available.

10.5 Incompatible Materials

No data available. Do not mix Leachate with any other materials.

10.6 Hazardous Decomposition Products

Hazardous decomposition products formed under fire conditions. - Nitrogen oxides, Sulfur Oxides (SO_x), (NO_x) Other decomposition products – Under acidic conditions – Hydrogen Sulfide (H₂S), Basic conditions- Ammonia (NH₃)

In the event of fire: see section 5

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

Acute toxicity: Leachate may contain waterborne pathogens that could cause infections and disease.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation: No data available

Serious eye damage/eye irritation: No data available

Respiratory or skin sensitization: No data available

Germ cell mutagenicity: No data available

Carcinogenicity

IARC: No known component of this material present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No known component of this material present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No known component of this material present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Note that the material does contain carcinogenic components, but not at sufficient percentages for the material itself to be classified as carcinogenic.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

T22 Fish Toxicity Test - No fatalities.

12.2 Persistence and Degradability

No data available.

12.3 Bioaccumulative Potential

No data available.

12.4 Mobility in Soil

No data available.

12.5 Other Adverse Effects

An environmental hazard cannot be excluded in the event of improper handling or disposal.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Provide wastewater treatment in a licensed facility.

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT

Proper Shipping Name

Flammable liquids, n.o.s.

Hazard Class

3

Identification Number

UN1993

Label Codes

3

Packing Group

III

ERG Number

128

14.2 In Accordance with IMDG

Proper Shipping Name

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

EmS-No. (Fire)

NA - Only ship by ground transportation.

EmS-No. (Spillage) S-C

NA - Only ship by ground transportation.

MFAG Number

NA - Only ship by ground transportation.

14.3 In Accordance with IATA

Proper Shipping Name

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

No components are subject to reporting levels established by SARA Title III, Section 313.

SARA 311/312

If reporting thresholds are exceeded.

15.2 US State Regulations

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Other Information

Revision Date: Rev 1, 3/18/2024

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HMIS Rating

Health hazard: 1

Flammability: 2

Physical Hazard 0

NFPA Rating

Health hazard: 1

Fire Hazard: 2

Reactivity Hazard: 0

GHS Full Text Phrases

H226 Flammable Liquid and Vapor (Category 3).

H303 May be harmful if swallowed.

H313 May be harmful in contact with skin.

H333 May be harmful if inhaled.

Hazard Not Otherwise Classified (HNOC).

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.

P220 Keep away from clothing and other combustible materials

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink, or smoke while using this product.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves, protective clothing, eye protection, face protection.

P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.

P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.

P353 Rise skin with water/shower.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Disclaimer:

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Media summary



Photo 1



Photo 2

Inspection

SECTION 1: IDENTIFICATION

1.1 Product Identifier

Product Form

Aqueous Solution

Product Name

Landfill Leachate - Primary Canyon

Synonyms

Landfill Leachate
Landfill Wastewater

1.2 Intended Use of the Product

Use of the substance/mixture

None

1.3 Name, Address, and Telephone of the Responsible Party/Company

Chiquita Canyon Landfill
29201 Henry Mayo Dr
Castaic, CA 91384
USA
Phone number: (661) 257-3655

Emergency Telephone Number

Steve Cassulo 661-371-9214
Nicole Ward 661-425-4619
IF MEDICAL EMERGENCY, DIAL 911

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the Substance or Mixture (GHS-US Classification)

Skin irritation (Category 2), H313
Hazard Not Otherwise Classified (HNOC)
For the full text of the Hazard Statements mentioned in this Section, see Section 16.

2.2 Label Elements (GHS-US Labeling)

Hazard Pictograms (GHS-US)



Photo 1

Signal Word (GHS-US)

WARNING

Hazard Statements (GHS-US)

H303 May be Harmful if swallowed.
H313 May be harmful in contact with skin.
H333 May be harmful if inhaled.
Hazard Not Otherwise Classified (HNOC)

Precautionary Statements (GHS-US)

P220 Keep away from clothing and other combustible materials
P262 Do not get in eyes, on skin, or on clothing .
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink, or smoke while using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection, face protection.
P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.
P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
P353 Rise skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other Hazards

May cause eye irritation.

2.4 Unknown Acute Toxicity (GHS-US)

None

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Landfill Leachate, Landfill Wastewater

3.2 Mixture (Include percentage of components)

No chemicals in excess of 0.1% have been detected. If leachate exhibits a change in characteristics described in Section 9, contact a supervisor and reevaluate PPE. Below table shows the detected compounds from analytical lab testing and the % of each detected compound (percent by weight assuming 1 liter of solution weighs 1000 grams):

Antimony: 0.0000073 - 0.000024 %
Arsenic: 0.000008 - 0.000046 %
Barium: 0.0000025 - 0.0006 %
Copper: 0.000015 - 0.00015 %
Zinc: 0.000023 - 0.00038 %

1,4 - Dichlorobenzene: 0.000002 - 0.000003 %
2-Butanone: 0.00031-0.00078 %
Benzene: 0.0000008 - 0.0000009 %
3-,4-Methylphenol: 0.000091 - 0.00019 %
Pyridine: 0.000031 - 0.00006 %

These compounds are assumed to be present in trace amounts in the leachate: Beryllium, Chromium, Cobalt, Lead, Molybdenum, Nickel, Vanadium, 2-Methylphenol. Analytical testing did not confirm detection of the analytes across all samples tested.

Component (include percentage & GHS-US classification)

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1 Description of First-aid Measures

Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact, wash off with soap and plenty of water. Consult a physician.

In case of eye contact, rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to medical treatment.

4.2 Most Important Symptoms and Effects Both Acute and Delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

Suitable extinguishing media.

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special Hazards Arising From the Substance or Mixture

No data available.

5.3 Advice for Firefighters

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Use personal protective equipment (see section 8.2.2). Avoid becoming contaminated; do not touch your face or body; do not smoke, eat, or drink unless you have washed your hands and face thoroughly with soap and water; clean all exposed wounds, however small, and cover with a sterile, waterproof dressing; change out of contaminated clothing before eating, drinking, or smoking. Avoid breathing vapors, mist or gas.

Ensure adequate ventilation. Evacuate personnel to safe areas. If skin contact occurs, wash thoroughly with soap and water.

6.1.1 For Non-Emergency Personnel

See section 6.1.

6.1.2 For Emergency Personnel

See section 6.1 and section 8.2 for proper PPE requirements for any clean up of spills.

6.2 Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and Materials for Containment and Cleaning Up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed and labeled containers for disposal. Don proper PPE as described in section 8.2.

6.4 Reference to Other Sections

For disposal see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for Safe Handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. For precautions see section 2.2.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

Keep container closed in a well-ventilated space.

7.3 Specific End Use(s)

None.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday.

8.2.2 Personal Protective Equipment (PPE)

Avoid dermal (skin) contact with leachate by using appropriate chemical-resistant gloves, boots, and/or body protection constructed from a material that is fire resistant and has a chemical permeation time sufficient to prevent dermal contact during the task. Benzene will permeate PPE constructed of nitrile, butyl rubber, and neoprene in less than one hour and should be removed and replaced if contaminated. Cloth, leather, and

other glove materials that do not afford any chemical protection cannot be used for connecting/disconnecting transfer lines or other tasks where sufficient leachate contact may occur to permeate the glove material. For work tasks requiring extended contact with leachate (>1 hr.), chemical protective clothing such as Tychem 6000 FR must be worn. Chemical protective boots must be worn if required to walk through spilled or pooled leachate. To prevent dermal absorption, non-chemical protective clothing which has become contaminated with leachate should not be worn and may need to be discarded depending on the amount of contamination.

Fire resistant clothing must be worn when conducting leachate transfers, working near open tank hatches, and when in the vicinity of spilled leachate, seeps, and other exposed leachate sources.

When conducting transfer of leachate by hose or other method where splash or spray hazard is present, a face shield must be worn at minimum. If transfer hoses were under sufficient pressure during transfer that an improperly depressurized line, or line failure, could result in heavy soaking spray face shield and/or goggles must be worn during line disconnect. If an overhead hazard exists (e.g., transferring from an elevated container) goggles must be worn with face shield.

Include photos or pictograms of PPEs

8.2.3 Materials for Protective Clothing

Eye/face protection: Safety glasses with side shields or safety goggles worn at all times. If conducting a leachate transfer, safety face shield also must be worn. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH or EN 166.

Skin protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws. Wash and dry hands. Use Nitrile Rubber gloves, minimum layer thickness 0.2mm with break through time of 60 min. IF GLOVES BECOME CONTAMINATED, REMOVE AND REPLACE.

Body protection: Full Tychem 6000 FR chemical protective clothing suit plus chemical resistant boots.

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi- purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH.

8.2.4 Environmental Exposure Controls

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

8.2.5 Other Information

OSHA PEL for reliably detected Chemicals in Material:

Antimony: 0.5 mg/m³ 8 hour TWA

Arsenic: 0.01 mg/m³ 8 hour TWA

Barium: 0.5 mg/m³ 8 hour TWA

Copper: 1 mg/m³ 8 hour TWA

Zinc: 10 mg/m³ 8 hour TWA

1,4 - Dichlorobenzene: 10 ppm 8 hour TWA

2-Butanone: 200 ppm 8 hour TWA

Benzene: 1 ppm 8 hour TWA

3-,4-Methylphenol: 5 ppm 8 hour TWA

Pyridine: 5 ppm 8 hour TWA

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

Physical State

Liquid

Appearance

Clear/colorless to light brown

Odor

Light Leachate odor

pH

5.05-5.78

Evaporation Rate

Similar to water.

Melting Point

Similar but likely above water.

Freezing Point

Similar but likely below water.

Boiling Point

No data available.

Flash Point

212 deg F.

9.2 Other Information

No other data available.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Potentially reactive with strong acids or strong oxidizers.

10.2 Chemical Stability

Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions

No data available.

10.4 Conditions to Avoid

No data available.

10.5 Incompatible Materials

No data available. Do not mix Leachate with any other materials.

10.6 Hazardous Decomposition Products

Hazardous decomposition products formed under fire conditions. - Nitrogen oxides, Sulfur Oxides (SO_x), (NO_x) Other decomposition products – Under acidic conditions – Hydrogen Sulfide (H₂S), Basic conditions- Ammonia (NH₃)
In the event of fire: see section 5

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

Acute toxicity: Leachate may contain waterborne pathogens that could cause infections and disease.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation: No data available

Serious eye damage/eye irritation: No data available

Respiratory or skin sensitization: No data available

Germ cell mutagenicity: No data available

Carcinogenicity

IARC: No known component of this material present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No known component of this material present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No known component of this material present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Note that the material does contain carcinogenic components, but not at sufficient percentages for the material itself to be classified as carcinogenic.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

T22 Fish Toxicity Test - No fatalities.

12.2 Persistence and Degradability

No data available.

12.3 Bioaccumulative Potential

No data available.

12.4 Mobility in Soil

No data available.

12.5 Other Adverse Effects

An environmental hazard cannot be excluded in the event of improper handling or disposal.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Provide wastewater treatment in a licensed facility.

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT

Proper Shipping Name

Not regulated as dangerous goods.

Hazard Class

NA

Identification Number

NA

Label Codes

NA

Packing Group

NA

ERG Number

NA

14.2 In Accordance with IMDG

Proper Shipping Name

NA

Hazard Class

NA

Subsidiary Risk(s)

NA

Identification Number

NA

Packing Group

NA

Label Codes

NA

EmS-No. (Fire)

NA

EmS-No. (Spillage) S-C

NA

MFAG Number

NA

14.3 In Accordance with IATA

Proper Shipping Name

Not regulated as dangerous goods IATA.
Not regulated as dangerous goods.

Packing Group

NA

Identification Number

NA

Hazard Class

NA

Label Codes

NA

Subsidiary Risk(s)

NA

SECTION 15: REGULATORY INFORMATION**15.1 US Federal Regulations**

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

No components are subject to reporting levels established by SARA Title III, Section 313.

SARA 311/312

If reporting thresholds are exceeded.

15.2 US State Regulations

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Other Information

Revision Date: Rev 1, 3/18/2024

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HMIS Rating

Health hazard: 1

Flammability: 1

Physical Hazard 0

NFPA Rating

Health hazard: 1

Fire Hazard: 1

Reactivity Hazard: 0

GHS Full Text Phrases

H303 May be harmful if swallowed.

H313 May be harmful in contact with skin.

H333 May be harmful if inhaled.

Hazard Not Otherwise Classified (HNOC).

P220 Keep away from clothing and other combustible materials

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink, or smoke while using this product.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves, protective clothing, eye protection, face protection.

P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.

P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.

P353 Rise skin with water/shower.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Disclaimer:

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Media summary



Photo 1

Inspection

SECTION 1: IDENTIFICATION

1.1 Product Identifier

Product Form

Aqueous Solution

Product Name

Landfill Leachate - Tank Farm A

Synonyms

Landfill Leachate
Landfill Wastewater

1.2 Intended Use of the Product

Use of the substance/mixture

None

1.3 Name, Address, and Telephone of the Responsible Party/Company

Chiquita Canyon Landfill
29201 Henry Mayo Dr
Castaic, CA 91384
USA
Phone number: (661) 257-3655

Emergency Telephone Number

Steve Cassulo 661-371-9214
Nicole Ward 661-425-4619
IF MEDICAL EMERGENCY, DIAL 911

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the Substance or Mixture (GHS-US Classification)

Skin irritation (Category 2), H313
Combustible Liquid (Category 4), H227
Hazard Not Otherwise Classified (HNOC)
For the full text of the Hazard Statements mentioned in this Section, see Section 16.

2.2 Label Elements (GHS-US Labeling)

Hazard Pictograms (GHS-US)



Photo 1

Signal Word (GHS-US)

WARNING

Hazard Statements (GHS-US)

H227 Combustible Liquid
H303 May be Harmful if swallowed.
H313 May be harmful in contact with skin.
H320 Causes eye irritation.
H333 May be Harmful if inhaled.
Hazard Not Otherwise Classified (HNOC)

Precautionary Statements (GHS-US)

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.
P220 Keep away from clothing and other combustible materials
P262 Do not get in eyes, on skin, or on clothing .
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink, or smoke while using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection, face protection.
P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.
P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
P353 Rise skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other Hazards

May cause eye irritation.

2.4 Unknown Acute Toxicity (GHS-US)

None

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Landfill Leachate, Landfill Wastewater

3.2 Mixture (Include percentage of components)

No chemicals in excess of 0.1% have been detected. If leachate exhibits a change in characteristics described in Section 9, contact a supervisor and reevaluate PPE. Below table shows the detected compounds from analytical lab testing and the % of each detected compound (percent by weight assuming 1 liter of solution weighs 1000 grams):

Antimony: 0.0000047 - 0.000043 %
Arsenic: 0.000015 - 0.000037 %

Barium: 0.00016 - 0.00029 %
Chromium: 0.000037 - 0.000075 %
Cobalt: 0.000002 - 0.0000063 %
Copper: 0.0000023 - 0.000028 %
Nickel: 0.000011 - 0.000028 %
Vanadium: 0.000012 - 0.000022 %
Zinc: 0.0000078 - 0.000038 %
2-Butanone: 0.00051-0.0061 %
Benzene: 0.00003 - 0.00007 %
3-,4-Methylphenol: 0.00082 - 0.0032 %
Pyridine: 0.000021 - 0.000055 %

These compounds are assumed to be present in trace amounts in the leachate: Lead, Molybdenum, Selenium, Silver, Mercury, 2-Methylphenol. Analytical testing did not confirm detection across all samples tested.

Component (include percentage & GHS-US classification)

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1 Description of First-aid Measures

Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact, wash off with soap and plenty of water. Consult a physician.

In case of eye contact, rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to medical treatment.

4.2 Most Important Symptoms and Effects Both Acute and Delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

Suitable extinguishing media.

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special Hazards Arising From the Substance or Mixture

No data available.

5.3 Advice for Firefighters

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Use personal protective equipment (see section 8.2.2). Avoid becoming contaminated; do not touch your face or body; do not smoke, eat, or drink unless you have washed your hands and face thoroughly with soap and water; clean all exposed wounds, however small, and cover with a sterile, waterproof dressing; change out of contaminated clothing before eating, drinking, or smoking. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. If skin contact occurs, wash thoroughly with soap and water.

6.1.1 For Non-Emergency Personnel

See section 6.1.

6.1.2 For Emergency Personnel

See section 6.1 and section 8.2 for proper PPE requirements for any clean up of spills.

6.2 Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and Materials for Containment and Cleaning Up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed and labeled containers for disposal. Don proper PPE as described in section 8.2.

6.4 Reference to Other Sections

For disposal see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for Safe Handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. For precautions see section 2.2.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

Keep container closed in a well-ventilated space.

7.3 Specific End Use(s)

None.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday.

8.2.2 Personal Protective Equipment (PPE)

Avoid dermal (skin) contact with leachate by using appropriate chemical-resistant gloves, boots, and/or body protection constructed from a material that is fire resistant and has a chemical permeation time sufficient to prevent dermal contact during the task. Benzene will permeate PPE constructed of nitrile, butyl rubber, and neoprene in less than one hour and should be removed and replaced if contaminated. Cloth, leather, and other glove materials that do not afford any chemical protection cannot be used for connecting/disconnecting transfer lines or other tasks where sufficient leachate contact may occur to permeate the glove material. For work tasks requiring extended contact with leachate (>1 hr.), chemical protective clothing such as Tychem 6000 FR must be worn. Chemical protective boots must be worn if required to walk through spilled or pooled leachate. To prevent dermal absorption, non-chemical protective clothing which has become contaminated with leachate should not be worn and may need to be discarded depending on the amount of contamination.

Due to the potential presence of flammable liquids and vapors, fire resistant clothing must be worn when conducting leachate transfers, working near open tank hatches, and when in the vicinity of spilled leachate, seeps, and other exposed leachate sources.

When conducting transfer of leachate by hose or other method where splash or spray hazard is present, a face shield must be worn at minimum. If transfer hoses were under sufficient pressure during transfer that an improperly depressurized line, or line failure, could result in heavy soaking spray face shield and/or goggles must be worn during line disconnect. If an overhead hazard exists (e.g., transferring from an elevated container) goggles must be worn with face shield.

Include photos or pictograms of PPEs

8.2.3 Materials for Protective Clothing

Eye/face protection: Safety glasses with side shields or safety goggles worn at all times. If conducting a leachate transfer, safety face shield also must be worn. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH or EN 166.

Skin protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws. Wash and dry hands. Use Nitrile Rubber gloves, minimum layer thickness 0.2mm with break through time of 60 min. IF GLOVES BECOME CONTAMINATED, REMOVE AND REPLACE.

Body protection: Full Tychem 6000 FR chemical protective clothing suit plus chemical resistant boots.

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi- purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH.

8.2.4 Environmental Exposure Controls

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

8.2.5 Other Information

OSHA PEL for reliably detected Chemicals in Material:

Antimony: 0.5 mg/m³ 8 hour TWA
Arsenic: 0.01 mg/m³ 8 hour TWA
Barium: 0.5 mg/m³ 8 hour TWA
Chromium: 1 mg/m³ 8 hour TWA
Cobalt: 0.02 mg/m³ 8 hour TWA
Copper: 1 mg/m³ 8 hour TWA
Nickel: 0.5 mg/m³ 8 hour TWA
Vanadium: 0.05 mg/m³ 8 hour TWA
Zinc: 10 mg/m³ 8 hour TWA
2-Butanone: 200 ppm 8 hour TWA

Benzene: 1 ppm 8 hour TWA
3-,4-Methylphenol: 5 ppm 8 hour TWA
Pyridine: 5 ppm 8 hour TWA

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

Physical State

Liquid

Appearance

Clear/colorless to light brown

Odor

Light Leachate odor

pH

6.49-6.93

Evaporation Rate

Similar to water.

Melting Point

Similar but likely above water.

Freezing Point

Similar but likely below water.

Boiling Point

No data available.

Flash Point

176 deg F.

9.2 Other Information

No other data available.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Potentially reactive with strong acids or strong oxidizers.

10.2 Chemical Stability

Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions

No data available.

10.4 Conditions to Avoid

No data available.

10.5 Incompatible Materials

No data available. Do not mix Leachate with any other materials.

10.6 Hazardous Decomposition Products

Hazardous decomposition products formed under fire conditions. - Nitrogen oxides, Sulfur Oxides (SO_x), (NO_x) Other decomposition products – Under acidic conditions – Hydrogen Sulfide (H₂S), Basic conditions- Ammonia (NH₃)

In the event of fire: see section 5

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

Acute toxicity: Leachate may contain waterborne pathogens that could cause infections and disease.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation: No data available

Serious eye damage/eye irritation: No data available

Respiratory or skin sensitization: No data available

Germ cell mutagenicity: No data available

Carcinogenicity

IARC: No known component of this material present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No known component of this material present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No known component of this material present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Note that the material does contain carcinogenic components, but not at sufficient percentages for the material itself to be classified as carcinogenic.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

T22 Fish Toxicity Test - No fatalities.

12.2 Persistence and Degradability

No data available.

12.3 Bioaccumulative Potential

No data available.

12.4 Mobility in Soil

No data available.

12.5 Other Adverse Effects

An environmental hazard cannot be excluded in the event of improper handling or disposal.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Provide wastewater treatment in a licensed facility.

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT

Proper Shipping Name

Combustible liquid, n.o.s.

Hazard Class

Comb. liq

Identification Number

NA1993

Label Codes

None

Packing Group

III

ERG Number

128

14.2 In Accordance with IMDG

Proper Shipping Name

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

EmS-No. (Fire)

NA - Only ship by ground transportation.

EmS-No. (Spillage) S-C

NA - Only ship by ground transportation.

MFAG Number

NA - Only ship by ground transportation.

14.3 In Accordance with IATA

Proper Shipping Name

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

No components are subject to reporting levels established by SARA Title III, Section 313.

SARA 311/312

If reporting thresholds are exceeded.

15.2 US State Regulations

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Other Information

Revision Date: Rev 1, 3/18/2024

License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the material with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the material. Chiquita Canyon Landfill shall not be held liable for any damage resulting from the handling or from contact with the above material.

HMIS Rating

Health hazard: 1

Flammability: 2

Physical Hazard 0

NFPA Rating

Health hazard: 1

Fire Hazard: 2

Reactivity Hazard: 0

GHS Full Text Phrases

H227 Combustible Liquid.

H303 May be harmful if swallowed.

H313 May be harmful in contact with skin.

H333 May be harmful if inhaled.

Hazard Not Otherwise Classified (HNOC).

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.

P220 Keep away from clothing and other combustible materials

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink, or smoke while using this product.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves, protective clothing, eye protection, face protection.

P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.

P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.

P353 Rise skin with water/shower.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Disclaimer:

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Media summary



Photo 1

Inspection

SECTION 1: IDENTIFICATION

1.1 Product Identifier

Product Form

Aqueous Solution

Product Name

Landfill Leachate - Tank Farm B

Synonyms

Landfill Leachate
Landfill Wastewater

1.2 Intended Use of the Product

Use of the substance/mixture

None

1.3 Name, Address, and Telephone of the Responsible Party/Company

Chiquita Canyon Landfill
29201 Henry Mayo Dr
Castaic, CA 91384
USA
Phone number: (661) 257-3655

Emergency Telephone Number

Steve Cassulo 661-371-9214
Nicole Ward 661-425-4619
IF MEDICAL EMERGENCY, DIAL 911

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the Substance or Mixture (GHS-US Classification)

Skin irritation (Category 2), H313
Flammable Liquid and Vapor (Category 3), H226
Hazard Not Otherwise Classified (HNOC)
For the full text of the Hazard Statements mentioned in this Section, see Section 16.

2.2 Label Elements (GHS-US Labeling)

Hazard Pictograms (GHS-US)



Photo 1



Photo 2

Signal Word (GHS-US)

WARNING

Hazard Statements (GHS-US)

H226 Flammable Liquid and Vapor
H303 May be Harmful if swallowed.
H313 May be harmful in contact with skin.
H333 May be Harmful if inhaled.
Hazard Not Otherwise Classified (HNOC)

Precautionary Statements (GHS-US)

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.
P220 Keep away from clothing and other combustible materials
P262 Do not get in eyes, on skin, or on clothing .
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink, or smoke while using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection, face protection.
P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.
P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
P353 Rise skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other Hazards

May cause eye irritation.

2.4 Unknown Acute Toxicity (GHS-US)

None

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Landfill Leachate, Landfill Wastewater

3.2 Mixture (Include percentage of components)

No chemicals in excess of 0.1% have been detected. If leachate exhibits a change in characteristics described in Section 9, contact a supervisor and reevaluate PPE. Below table shows the detected compounds from analytical lab testing and the % of each detected compound (percent by weight assuming 1 liter of solution weighs 1000 grams):

Antimony: 0.0000073 - 0.000072 %
Arsenic: 0.0000049 - 0.000068 %
Barium: 0.00002 - 0.00068 %

Beryllium: 0.00000021 - 0.00000044 %
Chromium: 0.000028 - 0.00013 %
Cobalt: 0.0000016 - 0.000011 %
Copper: 0.0000022 - 0.000016 %
Lead: 0.0000046 - 0.0010 %
Molybdenum: 0.0000038 - 0.000011 %
Nickel: 0.0000038 - 0.000028 %
Vanadium: 0.0000026 - 0.000063 %
Zinc: 0.0002 - 0.0033 %
2-Butanone: 0.0021-0.011 %
Benzene: 0.000008 - 0.00008 %
2-Methyphenol: 0.000012 - 0.00023 %
3-,4-Methylphenol: 0.0011 - 0.0022 %
Pyridine: 0.000031 - 0.00028 %

These compounds are assumed to be present in trace amounts in the leachate: Cadmium, Selenium, Silver, Mercury, 1,4-Dichlorobenzene, Tetrachloroethene, Pentachlorophenol. Analytical testing did not confirm detection of the analytes across all samples tested.

Component (include percentage & GHS-US classification)

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1 Description of First-aid Measures

Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact, wash off with soap and plenty of water. Consult a physician.

In case of eye contact, rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to medical treatment.

4.2 Most Important Symptoms and Effects Both Acute and Delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

Suitable extinguishing media.

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special Hazards Arising From the Substance or Mixture

No data available.

5.3 Advice for Firefighters

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

Use personal protective equipment (see section 8.2.2). Avoid becoming contaminated; do not touch your face or body; do not smoke, eat, or drink unless you have washed your hands and face thoroughly with soap and water; clean all exposed wounds, however small, and cover with a sterile, waterproof dressing; change out of contaminated clothing before eating, drinking, or smoking. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. If skin contact occurs, wash thoroughly with soap and water.

6.1.1 For Non-Emergency Personnel

See section 6.1.

6.1.2 For Emergency Personnel

See section 6.1 and section 8.2 for proper PPE requirements for any clean up of spills.

6.2 Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and Materials for Containment and Cleaning Up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed and labeled containers for disposal. Don proper PPE as described in section 8.2.

6.4 Reference to Other Sections

For disposal see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for Safe Handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. For precautions see section 2.2.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

Keep container closed in a well-ventilated space.

7.3 Specific End Use(s)

None.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at

the end of the workday.

8.2.2 Personal Protective Equipment (PPE)

Avoid dermal (skin) contact with leachate by using appropriate chemical-resistant gloves, boots, and/or body protection constructed from a material that is fire resistant and has a chemical permeation time sufficient to prevent dermal contact during the task. Benzene will permeate PPE constructed of nitrile, butyl rubber, and neoprene in less than one hour and should be removed and replaced if contaminated. Cloth, leather, and other glove materials that do not afford any chemical protection cannot be used for connecting/disconnecting transfer lines or other tasks where sufficient leachate contact may occur to permeate the glove material. For work tasks requiring extended contact with leachate (>1 hr.), chemical protective clothing such as Tychem 6000 FR must be worn. Chemical protective boots must be worn if required to walk through spilled or pooled leachate. To prevent dermal absorption, non-chemical protective clothing which has become contaminated with leachate should not be worn and may need to be discarded depending on the amount of contamination.

Due to the potential presence of flammable liquids and vapors, fire resistant clothing must be worn when conducting leachate transfers, working near open tank hatches, and when in the vicinity of spilled leachate, seeps, and other exposed leachate sources.

When conducting transfer of leachate by hose or other method where splash or spray hazard is present, a face shield must be worn at minimum. If transfer hoses were under sufficient pressure during transfer that an improperly depressurized line, or line failure, could result in heavy soaking spray face shield and/or goggles must be worn during line disconnect. If an overhead hazard exists (e.g., transferring from an elevated container) goggles must be worn with face shield.

Include photos or pictograms of PPEs

8.2.3 Materials for Protective Clothing

Eye/face protection: Safety glasses with side shields or safety goggles worn at all times. If conducting a leachate transfer, safety face shield also must be worn. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH or EN 166.

Skin protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws. Wash and dry hands. Use Nitrile Rubber gloves, minimum layer thickness 0.2mm with break through time of 60 min. IF GLOVES BECOME CONTAMINATED, REMOVE AND REPLACE.

Body protection: Full Tychem 6000 FR chemical protective clothing suit plus chemical resistant boots.

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi- purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH.

8.2.4 Environmental Exposure Controls

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

8.2.5 Other Information

OSHA PEL for reliably detected Chemicals in Material:

Antimony: 0.5 mg/m³ 8 hour TWA

Arsenic: 0.01 mg/m³ 8 hour TWA

Barium: 0.5 mg/m³ 8 hour TWA

Beryllium: 0.0002 mg/m³ 8 hour TWA

Chromium: 1 mg/m³ 8 hour TWA

Cobalt: 0.02 mg/m³ 8 hour TWA

Copper: 1 mg/m³ 8 hour TWA

Lead: 0.05 mg/m³ 8 hour TWA
Molybdenum: 0.5 mg/m³ 8 hour TWA
Nickel: 0.5 mg/m³ 8 hour TWA
Vanadium: 0.05 mg/m³ 8 hour TWA
Zinc: 10 mg/m³ 8 hour TWA
2-Butanone: 200 ppm 8 hour TWA
Benzene: 1 ppm 8 hour TWA
2-Methyphenol: 5 ppm 8 hour TWA
3-,4-Methylphenol: 5 ppm 8 hour TWA
Pyridine: 5 ppm 8 hour TWA

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

Physical State

Liquid

Appearance

Clear/colorless to light brown

Odor

Light Leachate odor

pH

5.1-6.87

Evaporation Rate

Similar to water.

Melting Point

Similar but likely above water.

Freezing Point

Similar but likely below water.

Boiling Point

No data available.

Flash Point

127 deg F.

9.2 Other Information

No other data available.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Potentially reactive with strong acids or strong oxidizers.

10.2 Chemical Stability

Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions

No data available.

10.4 Conditions to Avoid

No data available.

10.5 Incompatible Materials

No data available. Do not mix Leachate with any other materials.

10.6 Hazardous Decomposition Products

Hazardous decomposition products formed under fire conditions. - Nitrogen oxides, Sulfur Oxides (SO_x), (NO_x) Other decomposition products – Under acidic conditions – Hydrogen Sulfide (H₂S), Basic conditions- Ammonia (NH₃)

In the event of fire: see section 5

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

Acute toxicity: Leachate may contain waterborne pathogens that could cause infections and disease.

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation: No data available

Serious eye damage/eye irritation: No data available

Respiratory or skin sensitization: No data available

Germ cell mutagenicity: No data available

Carcinogenicity

IARC: No known component of this material present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No known component of this material present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No known component of this material present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Note that the material does contain carcinogenic components, but not at sufficient percentages for the material itself to be classified as carcinogenic.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

T22 Fish Toxicity Test - No fatalities.

12.2 Persistence and Degradability

No data available.

12.3 Bioaccumulative Potential

No data available.

12.4 Mobility in Soil

No data available.

12.5 Other Adverse Effects

An environmental hazard cannot be excluded in the event of improper handling or disposal.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Provide wastewater treatment in a licensed facility.

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT

Proper Shipping Name

Flammable liquids, n.o.s.

Hazard Class

3

Identification Number

UN1993

Label Codes

3

Packing Group

III

ERG Number

128

14.2 In Accordance with IMDG

Proper Shipping Name

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

EmS-No. (Fire)

NA - Only ship by ground transportation.

EmS-No. (Spillage) S-C

NA - Only ship by ground transportation.

MFAG Number

NA - Only ship by ground transportation.

14.3 In Accordance with IATA

Proper Shipping Name

NA - Only ship by ground transportation.

Packing Group

NA - Only ship by ground transportation.

Identification Number

NA - Only ship by ground transportation.

Hazard Class

NA - Only ship by ground transportation.

Label Codes

NA - Only ship by ground transportation.

Subsidiary Risk(s)

NA - Only ship by ground transportation.

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

No components are subject to reporting levels established by SARA Title III, Section 313.

SARA 311/312

If reporting thresholds are exceeded.

15.2 US State Regulations

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Other Information

Revision Date: Rev 1, 3/18/2024

License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the material with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the material. Chiquita Canyon Landfill shall not be held liable for any damage resulting from the handling or from contact with the above material.

HMIS Rating

Health hazard: 1

Flammability: 2

Physical Hazard 0

NFPA Rating

Health hazard: 1

Fire Hazard: 2

Reactivity Hazard: 0

GHS Full Text Phrases

H226 Flammable Liquid and Vapor (Category 3).

H303 May be harmful if swallowed.

H313 May be harmful in contact with skin.

H333 May be harmful if inhaled.

Hazard Not Otherwise Classified (HNOC).

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.

P220 Keep away from clothing and other combustible materials

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink, or smoke while using this product.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves, protective clothing, eye protection, face protection.
P301+P312+P330 IF SWALLOWED: Call a Poison Center/ doctor if you feel unwell. Rinse mouth.
P301+P330+331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
P353 Rinse skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Disclaimer:

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Media summary



Photo 1



Photo 2

Section 1. Identification

GHS product identifier : Hydrogen Peroxide 34%
Product code : 1010007-00
Other means of identification : Not available.
Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Product use : Industrial Use Only

Supplier's details : Solugen Blending, LLC
14549 Minetta St.
Houston, Texas 77035
info@solugentech.com
713-380-2134

Emergency telephone number : ChemTel US: 1-800-255-3924
ChemTel International: +1-813-248-0585
Contract Number: MIS8823660

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : OXIDIZING LIQUIDS - Category 1
ACUTE TOXICITY (oral) - Category 4
ACUTE TOXICITY (inhalation) - Category 4
SKIN CORROSION - Category 1B
EYE IRRITATION - Category 2A
CARCINOGENICITY - Category 1
Percentage of the mixture consisting of ingredient(s) of unknown acute oral toxicity: 66%
Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 66%

GHS label elements

Hazard pictograms : 

Signal word : Danger

Hazard statements : May cause fire or explosion; strong oxidizer.
Harmful if swallowed or if inhaled.
Causes severe skin burns and eye damage.
May cause cancer. (oral)

Precautionary statements

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear fire resistant or flame retardant clothing. Wear protective gloves, protective clothing and eye or face protection. Keep away from heat. No smoking. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

Section 2. Hazards identification

Response : In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. IF exposed or concerned: Get medical advice or attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. IF SWALLOWED: Immediately call a POISON CENTER or doctor. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Immediately call a POISON CENTER or doctor. Wash contaminated clothing before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention. IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

Ingredient name	%	CAS number
hydrogen peroxide solution	≥25 - <35	7722-84-1

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Get medical attention immediately. Call a poison center or physician. Rinse immediately contaminated clothing and skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in

Section 4. First aid measures

recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : Harmful if inhaled.
- Skin contact** : Causes severe burns.
- Ingestion** : Harmful if swallowed.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain
watering
redness
- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
- Ingestion** : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.

- Specific hazards arising from the chemical** : Strongly oxidizing material. May cause fire or explosion. In a fire or if heated, a pressure increase will occur and the container may burst.

- Hazardous thermal decomposition products** : No specific data.

- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Do not absorb in sawdust or other combustible material. It may lead to a fire risk when it dries out. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Do not absorb in sawdust or other combustible material. It may lead to a fire risk when it dries out. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from clothing, incompatible materials and combustible materials. Wear fire resistant clothing. Keep away from heat. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Separate from reducing agents and combustible materials. Store away from grease and oil. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
hydrogen peroxide solution	ACGIH TLV (United States, 1/2021). TWA: 1 ppm 8 hours. TWA: 1.4 mg/m ³ 8 hours. OSHA PEL 1989 (United States, 3/1989). TWA: 1 ppm 8 hours. TWA: 1.4 mg/m ³ 8 hours. NIOSH REL (United States, 10/2020). TWA: 1 ppm 10 hours. TWA: 1.4 mg/m ³ 10 hours. OSHA PEL (United States, 5/2018). TWA: 1 ppm 8 hours. TWA: 1.4 mg/m ³ 8 hours.
hydrogen peroxide solution	ACGIH TLV (United States, 1/2021). TWA: 1 ppm 8 hours. TWA: 1.4 mg/m ³ 8 hours. OSHA PEL 1989 (United States, 3/1989). TWA: 1 ppm 8 hours. TWA: 1.4 mg/m ³ 8 hours. NIOSH REL (United States, 10/2020). TWA: 1 ppm 10 hours. TWA: 1.4 mg/m ³ 10 hours. OSHA PEL (United States, 5/2018). TWA: 1 ppm 8 hours. TWA: 1.4 mg/m ³ 8 hours.

Appropriate engineering controls

- : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls

- : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

- : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

- : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection

- : Gloves impervious to the chemical substance are required. Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Section 8. Exposure controls/personal protection

- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance

- Physical state** : Liquid.
- Color** : Colorless.
- Odor** : Sharp.
- Odor threshold** : Not available.
- pH** : Not available.
- Melting point/freezing point** : -0.43°C (31.2°F)
- Boiling point, initial boiling point, and boiling range** : 108°C (226.4°F)
- Flash point** : Not available.
- Evaporation rate** : Not available.
- Flammability** : Not available.
- Lower and upper explosion limit/flammability limit** : Not available.
- Vapor pressure** : 0.1 kPa (0.75 mm Hg)
- Relative vapor density** : 1 [Air = 1]
- Relative density** : 1.3
- Density** : 1.13 g/cm³ [20°C (68°F)]
- Solubility** : Not available.
- Solubility in water** : Not available.
- Miscible with water** : Yes.
- Partition coefficient: n-octanol/water** : -1.36
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.
- Viscosity** : Not available.
- Flow time (ISO 2431)** : Not available.

Particle characteristics

- Median particle size** : Not applicable.

Section 10. Stability and reactivity

- Reactivity** : No specific test data related to reactivity available for this product or its ingredients.
- Chemical stability** : The product is stable.

Section 10. Stability and reactivity

Possibility of hazardous reactions : Hazardous reactions or instability may occur under certain conditions of storage or use.
Conditions may include the following:
contact with combustible materials
Reactions may include the following:
risk of explosion

Conditions to avoid : Drying on clothing or other combustible materials may cause fire.

Incompatible materials : Highly reactive or incompatible with the following materials:
combustible materials
reducing materials

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
hydrogen peroxide solution	Eyes - Severe irritant	Rabbit	-	1 mg	-
hydrogen peroxide solution	Eyes - Severe irritant	Rabbit	-	1 mg	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
hydrogen peroxide solution	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
hydrogen peroxide solution	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Section 11. Toxicological information

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.
Inhalation : Harmful if inhaled.
Skin contact : Causes severe burns.
Ingestion : Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
 pain
 watering
 redness
Inhalation : No specific data.
Skin contact : Adverse symptoms may include the following:
 pain or irritation
 redness
 blistering may occur
Ingestion : Adverse symptoms may include the following:
 stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.
Carcinogenicity : May cause cancer if swallowed. Risk of cancer depends on duration and level of exposure.
Mutagenicity : No known significant effects or critical hazards.
Reproductive toxicity : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
hydrogen peroxide solution	500	N/A	N/A	11	N/A
hydrogen peroxide solution	500	N/A	N/A	11	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
hydrogen peroxide solution	Acute EC50 1.2 mg/l Marine water	Algae - Dunaliella tertiolecta - Exponential growth phase	72 hours
	Acute EC50 2320 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
hydrogen peroxide solution	Acute LC50 93 ppm Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Chronic NOEC 100 mg/l Fresh water	Fish - Micropterus salmoides	28 days
	Acute EC50 1.2 mg/l Marine water	Algae - Dunaliella tertiolecta - Exponential growth phase	72 hours
	Acute EC50 2320 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 93 ppm Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Chronic NOEC 100 mg/l Fresh water	Fish - Micropterus salmoides	28 days

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
hydrogen peroxide solution	-1.36	-	low
hydrogen peroxide solution	-1.36	-	low

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.











Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IMDG	IATA
UN number	UN2014	UN2014	UN2014	UN2014	UN2014
UN proper shipping name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION	HYDROGEN PEROXIDE, AQUEOUS SOLUTION	PEROXIDO DE HIDROGENO EN SOLUCION ACUOSA	HYDROGEN PEROXIDE, AQUEOUS SOLUTION	Hydrogen peroxide, aqueous solution

Section 14. Transport information

Transport hazard class(es)	5.1 (8)  	5.1 (8)  	5.1 (8)  	5.1 (8)  	5.1 (8)  
Packing group	II	II	II	II	II
Environmental hazards	No.	No.	No.	No.	No.

Additional information

TDG Classification

: Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.23-2.25 (Class 5), 2.40-2.42 (Class 8).

Explosive Limit and Limited Quantity Index 1

Passenger Carrying Vessel Index Forbidden

Passenger Carrying Road or Rail Index Forbidden

Mexico Classification

: **Special provisions** 65

IATA

: The environmentally hazardous substance mark may appear if required by other transportation regulations.

Quantity limitation Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: Forbidden. Limited Quantities - Passenger Aircraft: Forbidden.

Remarks Air regulation permit shipment of Hydrogen Peroxide (<=40%) in non-vented containers for Air Cargo Only aircraft, as well as for Passenger and Cargo aircraft. HOWEVER, all Solugen Hydrogen Peroxide containers are vented and therefore, air shipments of Solugen H₂O₂ are not permitted. IATA air regulations state that venting of packages containing oxidizing substances is not permitted for air transport.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

U.S. Federal regulations : TSCA 8(a) CDR Exempt/Partial exemption: Not determined

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
hydrogen peroxide solution	≥25 - <35	Yes.	1000	106.1	1000	106.1

SARA 304 RQ : 1000 lbs / 454 kg [106.1 gal / 401.8 L]

Section 15. Regulatory information

SARA 311/312

Classification : OXIDIZING LIQUIDS - Category 1
 ACUTE TOXICITY (oral) - Category 4
 ACUTE TOXICITY (inhalation) - Category 4
 SKIN CORROSION - Category 1B
 EYE IRRITATION - Category 2A
 CARCINOGENICITY - Category 1

Composition/information on ingredients

Name	%	Classification
hydrogen peroxide solution	≥25 - <35	OXIDIZING LIQUIDS - Category 1 ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION - Category 1A EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

State regulations

Massachusetts : The following components are listed: HYDROGEN PEROXIDE
New York : The following components are listed: Hydrogen peroxide
New Jersey : The following components are listed: HYDROGEN PEROXIDE
Pennsylvania : The following components are listed: HYDROGEN PEROXIDE

California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : All components are listed or exempted.
Canada : All components are listed or exempted.
China : All components are listed or exempted.
Europe : All components are listed or exempted.
Japan : **Japan inventory (CSCL)**: All components are listed or exempted.
Japan inventory (ISHL): All components are listed or exempted.
New Zealand : All components are listed or exempted.
Philippines : All components are listed or exempted.
Republic of Korea : All components are listed or exempted.
Taiwan : All components are listed or exempted.
Thailand : All components are listed or exempted.
Turkey : All components are listed or exempted.
United States : All components are active or exempted.

Section 15. Regulatory information

Viet Nam : All components are listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	*	3
Flammability		0
Physical hazards		3

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)



Procedure used to derive the classification

Classification	Justification
OXIDIZING LIQUIDS - Category 1 ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION - Category 1B EYE IRRITATION - Category 2A CARCINOGENICITY - Category 1	Expert judgment Calculation method Calculation method Calculation method On basis of test data Expert judgment

History

Date of printing : 12/28/2021

Date of issue/Date of revision : 12/28/2021

Date of previous issue : 5/17/2021

Version : 3

Key to abbreviations :

- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- N/A = Not available
- SGG = Segregation Group
- UN = United Nations

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

Section 16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Safety Data Sheet

CAUSTIC SODA 50%

Version 1.10

Revision Date: 11/11/2023

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : CAUSTIC SODA 50%

Recommended use of the chemical and restrictions on use

Recommended use : Reserved for industrial and professional use.

Manufacturer or supplier's details

Company : Univar Solutions USA
Address : 3075 Highland Pkwy Suite 200
 Downers Grove, IL 60515
 United States of America (USA)

Emergency telephone number:

Transport North America: CHEMTREC (1-800-424-9300)

CHEMTREC INTERNATIONAL Tel # 703-527-3887

Additional Information: : Responsible Party: Product Compliance Department
 E-mail: SDSNA@univarsolutions.com
 SDS Requests: 1-855-429-2661
 Website: www.univarsolutions.com

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Corrosive to metals : Category 1

Acute toxicity (Oral) : Category 4

Skin corrosion : Category 1A

Serious eye damage : Category 1

Specific target organ toxicity
 - single exposure : Category 3 (Respiratory system)

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : H290 May be corrosive to metals.
 H302 Harmful if swallowed.
 H314 Causes severe skin burns and eye damage.
 H335 May cause respiratory irritation.

Precautionary statements : **Prevention:**
 P234 Keep only in original container.
 P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
 P264 Wash skin thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.

Safety Data Sheet

CAUSTIC SODA 50%

Version 1.10

Revision Date: 11/11/2023

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.

P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.

P363 Wash contaminated clothing before reuse.

P390 Absorb spillage to prevent material damage.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

P406 Store in corrosive resistant container with a resistant inner liner.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

CAS-No.	Chemical name	Weight percent
1310-73-2	Sodium hydroxide	50 - 70

Actual concentration is withheld as a trade secret

Any Concentration shown as a range is due to batch variation.

SECTION 4. FIRST AID MEASURES

- General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.
- If inhaled : If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.
- In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficul-

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In case of eye contact	<p>ty. If on skin, rinse well with water. If on clothes, remove clothes.</p> <p>: Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist. Take victim immediately to hospital.</p>
If swallowed	<p>: Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.</p>

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	<p>: Carbon dioxide (CO₂) Foam Dry powder Water mist</p>
Unsuitable extinguishing media	<p>: High volume water jet</p>
Specific hazards during fire-fighting	<p>: Do not allow run-off from fire fighting to enter drains or water courses.</p>
Hazardous combustion products	<p>: No hazardous combustion products are known</p>
Further information	<p>: Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.</p>
Special protective equipment for firefighters	<p>: Wear self-contained breathing apparatus for firefighting if necessary.</p>

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	<p>: Use personal protective equipment.</p>
Environmental precautions	<p>: Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.</p>
Methods and materials for	<p>: Soak up with inert absorbent material (e.g. sand, silica gel,</p>

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containment and cleaning up : acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Advice on safe handling : Do not breathe vapours/dust.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
To avoid spills during handling keep bottle on a metal tray.
Dispose of rinse water in accordance with local and national regulations.

Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Observe label precautions.
Electrical installations / working materials must comply with the technological safety standards.

Recommended storage temperature : 16 - 65 °C

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

CAS-No.	Components	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
1310-73-2	Sodium hydroxide	C	2 mg/m ³	ACGIH
		C	2 mg/m ³	NIOSH REL
		TWA	2 mg/m ³	OSHA Z-1
		C	2 mg/m ³	OSHA P0
		C	2 mg/m ³	CAL PEL

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

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Remarks	: The suitability for a specific workplace should be discussed with the producers of the protective gloves.
Eye protection	: Eye wash bottle with pure water Tightly fitting safety goggles Wear face-shield and protective suit for abnormal processing problems.
Skin and body protection	: Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures	: When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Colour	: No data available
Odour	: No data available
Odour Threshold	: No data available
pH	: 14
Freezing Point (Melting point/freezing point)	: 12 - 15 °C (54 - 59 °F)
Boiling Point (Boiling point/boiling range)	: 140 - 145 °C (284 - 293 °F)
Flash point	: does not flash
Evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Upper explosion limit	: No data available
Lower explosion limit	: No data available
Vapour pressure	: No data available
Relative vapour density	: No data available
Relative density	: 1.5298
Density	: 12.76 lb/gal
Water solubility	: No data available
Solubility in other solvents	: No data available
Partition coefficient: n-octanol/water	: No data available
Auto-ignition temperature	: No data available
Thermal decomposition	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Corrosive to metals Exothermic reaction with acids.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: No decomposition if stored and applied as directed.
Conditions to avoid	: Freezing temperatures.

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Incompatible materials	: Heat Acids Metals Oxidizing agents Halogenated compounds organic nitro compounds Zinc
Hazardous decomposition products	: Hydrogen

SECTION 11. TOXICOLOGICAL INFORMATION**Skin corrosion/irritation****Components:****1310-73-2:**

Species: Rabbit

Result: Causes severe burns.

Serious eye damage/eye irritation**Components:****1310-73-2:**

Species: Rabbit

Result: Risk of serious damage to eyes.

Carcinogenicity**IARC**

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA

No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

STOT - single exposure**Product:**

Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

Further information**Product:**

Remarks: No data available

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SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity**

No data available

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : No data available

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : Dispose of in accordance with all applicable local, state and federal regulations.
For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Univar Solutions ChemCare: 1-800-637-7922

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

DOT (Department of Transportation):
UN1824, Sodium hydroxide solution, 8, II

IATA (International Air Transport Association):
UN1824, Sodium hydroxide solution, 8, II

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IMDG (International Maritime Dangerous Goods):
UN1824, SODIUM HYDROXIDE SOLUTION, 8, II

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sodium hydroxide	1310-73-2	1000	2000

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Corrosive to metals
Skin corrosion or irritation
Serious eye damage or eye irritation
Acute toxicity (any route of exposure)
Specific target organ toxicity (single or repeated exposure)

SARA 302 : This material does not contain any components with a section 302 EHS TPQ.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

1310-73-2 Sodium hydroxide

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

1310-73-2 Sodium hydroxide

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

Massachusetts Right To Know

1310-73-2 Sodium hydroxide

Pennsylvania Right To Know

1310-73-2 Sodium hydroxide

7732-18-5 Water

California Prop 65 : This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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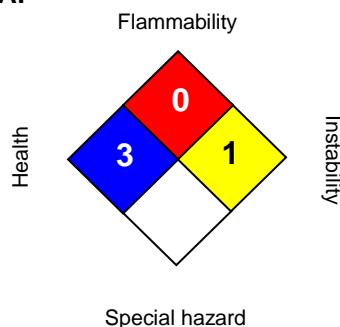
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The components of this product are reported in the following inventories:

TSCA	: On TSCA Inventory
DSL	: All components of this product are on the Canadian DSL
AICS	: On the inventory, or in compliance with the inventory
NZIoC	: Not in compliance with the inventory
ENCS	: On the inventory, or in compliance with the inventory
KECI	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory

SECTION 16. OTHER INFORMATION

NFPA:



HMIS III:

HEALTH	3/
FLAMMABILITY	0
PHYSICAL HAZARD	4

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

The information accumulated is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made become available subsequently to the date hereof, we do not assume any responsibility for the results of its use. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This SDS has been prepared by Univar Solutions Product Compliance Department (1-855-429-2661) SDSNA@univarsolutions.com.

Revision Date : 11/11/2023

Material number:

16212043, 16212042, 16212041, 16212039, 16212038, 16210888, 16149051, 16210426, 16208930, 16208441, 16207958, 16207089, 16206212, 16206172, 16195419, 16196593, 16203117, 16193663, 16191539, 16188943, 16188859, 16188905, 40509, 16144372, 85833, 16187875, 16187706, 16187503, 16187172, 16184289, 16184571, 16183215, 16183115,

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16181535, 16174812, 16176162, 16176725, 16175550, 16177057, 16176719, 16176286, 16175611, 16175549, 16177342, 16174633, 16176146, 16175652, 16175317, 16174795, 16174563, 16176924, 16180636, 16169042, 16168322, 16168270, 16168140, 16168139, 16179411, 16169006, 16168617, 16150547, 16162842, 16162538, 16144429, 16173515, 16168911, 16162950, 16162022, 16144216, 16143594, 16162020, 16168720, 16166706, 16152119, 16173289, 16179365, 16166192, 16137935, 16161861, 16143735, 16151817, 85472, 52714, 71460, 54298, 16168314, 16146819, 16163462, 16148908, 16144035, 16166958, 16166445, 16137825, 16151508, 16151289, 16160192, 16147037, 16156058, 16155066, 16135486

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		



Suite 450
One North Shore Center
12 Federal Street
Pittsburgh, PA 15212

Safety Data Sheet

KR-DF7018

1. IDENTIFICATION

Product name KR-DF7018
Description Organic Defoamer / Antifoam
Product class Antifoam / Defoamer
Supplier address Suite 450
One North Shore Center
12 Federal Street
Pittsburgh, PA 16212
Telephone numbers
Company Phone Number (412) 321-9800
Emergency Telephone CHEMTREC 1-800-424-9300

2. HAZARDS IDENTIFICATION

OSHA Regulatory Status HNOC: This product is considered a hazardous chemical according OSHA GHS Hazard Communication regulation 29 C.F.R. § 1910.1200.
Hazard classification NA
Signal word NA
Hazard statements NA
Pictograms of related hazards NA
Hazards not otherwise classified Defatting to the skin. Prolonged or repeated contact may dry skin and cause irritation.
Precautionary statements NA

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous or Regulated Components

Chemical Name	CAS #	Weight %
Distillates (petroleum), hydrotreated heavy naphthenic	647-52-5	88-96

The precise concentration is being withheld as a proprietary trade secret. Bona fide requests for disclosure to medical personnel must be made in accordance with the procedures in 29 C.F.R. § 1910.1200(i)1-13.

4. FIRST-AID MEASURES

Eye contact	Flush eyes with gently flowing water for a minimum of fifteen minutes. Check for and remove contact lenses. Hold eyelids apart to ensure rinsing of the entire surface of the eye and lids with water. If irritation develops, seek medical attention immediately.
Skin contact	Wash exposed areas with soap and water. Remove contaminated clothing while washing continuously. Discard contaminated clothing and shoes.
Ingestion	If swallowed, dilute with two glasses of water. Seek medical attention immediately. INDUCE VOMITING ONLY UPON ADVICE OF A PHYSICIAN. Never give anything by mouth if victim is unconscious or having convulsions.
Inhalation	Move victim to fresh air. Assist in breathing, if necessary, and seek immediate medical attention.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	This product will ignite when exposed to an ignition source while at a temperature at or above its flash point. Use carbon dioxide, dry chemical or alcohol-type foam or universal-type foams to extinguish flames. Water spray may be used to cool fire-exposed containers.
Unsuitable extinguishing media	No information available.
Protective equipment and precautions for firefighters	Wear self-contained breathing apparatus and protective clothing when combating a chemical fire in a confined area.
Specific hazards	Thermal breakdown of this product will evolve the following decomposition products: fumes, smoke, carbon monoxide, carbon dioxide and traces of incompletely burned hydrocarbon compounds. Overexposure to the products of combustion may result in respiratory irritation.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Remove spills promptly as they may make floors slippery. Several washes and/or the use of detergents may be necessary to completely clean any spill. Wear recommended protective equipment outlined in Section 8 of this document and provide adequate ventilation during clean-up.
Methods for clean-up	Spills should be contained, solidified with absorbent, noncombustible material and placed in labeled containers for disposal. Material should be disposed of at a licensed facility. As supplied, this material is not regulated by RCRA or CERCLA.

7. HANDLING AND STORAGE

Advice on safe handling	Avoid contact with eyes, skin and clothing. Use with adequate ventilation. Wash thoroughly after handling. Ensure that containers are properly secured prior to moving.
Storage conditions	Keep container closed during any storage. Protect from moisture and foreign materials. Avoid direct sunlight. Store product away from combustible materials. For optimum storage conditions, store between 45°F and 100°F.
Materials to avoid	No information available
Storage Stability	Keep out of sun and away from heat, sparks or open flame.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	OSHA PEL	ACGIH TLV
Distillates (petroleum), hydrotreated heavy naphthenic (CAS 64742-52-5)	5 mg/m ³ (Mist) 8 Hours	5 mg/m ³ (Inhalable fraction) 8 Hours

Occupational exposure controls	Control airborne concentrations below the exposure guideline. General Ventilation is recommended.
Eye protection	Safety glasses with side shields are recommended as a minimum, but chemical goggles or a face shield provide better protection.
Skin protection	Skin contact should be minimized. Wash all affected areas prior to eating and at completion of handling. Contaminated clothing should be removed at completion of handling. Impervious gloves (butyl, neoprene, nitrile), coveralls or apron and boots are recommended.

Respiratory protection

If proper ventilation is unavailable, use an NIOSH approved air-purifying respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

pH	ND
Appearance	Tan to pale amber opaque liquid
Odor	mild odor
Specific Gravity	0.885
Pour point	35°F
Melting/freezing point	ND
Boiling point/boiling range	ND
Flash point	> 149°C (>300°F)
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability	No information available
Vapor pressure	No data available
Vapor density	No data available
VOC content	3.2%, EPA Test Method 24
Solubility	Dispersible in water
Partition coefficient n-octanol/water	Not determined
Auto-ignition temperature	No information available
Decomposition temperature	No information available
Viscosity	600-1500 cP

10. STABILITY AND REACTIVITY**Reactivity**

Non-reactive product under normal use conditions.

Chemical stability

Stable under normal conditions of storage and handling.

Hazardous polymerization

Polymerization will not occur under normal use conditions.

Conditions to avoid

Heat, sparks and open flames

Incompatibilities

Strong acids, alkalis and strong oxidizing agents.

Hazardous decomposition products

Not anticipated under normal use conditions.

11. TOXICOLOGICAL INFORMATION

Likely routes of exposure Skin, eyes, ingestion

Acute toxicity

Test Material	Parameter	Result
Distillates (petroleum), hydrotreated heavy naphthenic (CAS 64742-52-5)	LD50, Oral (rat)	>5000 mg/L
	LD50, Dermal (rabbit)	>2000 mg/L
	LD50, Inhalation dust & mist (rat)	5.7 mg/L / 4 hours

Irritation and corrosion

Eye (acute)	May cause transient irritation, redness and/or tearing.
Eye (chronic)	No chronic effects anticipated.
Skin (acute)	May cause skin irritation and defatting of the skin.
Skin (chronic)	Prolonged and repeated contact can de-fat the skin and lead to irritation, cracking and/or dermatitis.
Ingestion (acute)	May result in nausea/intestinal discomfort.
Ingestion (chronic)	No chronic effects anticipated.
Inhalation (acute)	May irritate mouth, throat and stomach.
Inhalation (chronic)	No chronic effects anticipated.

Long term toxicity

Reproductive effects	None known.
Mutagenicity	None known.
Embryotoxicity	None known.
Sensitization to product	None known.
Synergistic products	None known.
Carcinogenicity	None known. Oil contains less than 3 % DMSO extract as measured by IP 346.
Chronic	None known.

12. ECOLOGICAL INFORMATION

No data available.

Mobility No information.

Biological degradability: No information

Bioaccumulative potential No information

13. DISPOSAL CONSIDERATIONS

Disposal Discarded product is not considered a hazardous waste under RCRA, 40 CFR 261. Please dispose of in accordance with all local, state and federal regulations. It is recommended that the waste be incinerated or land filled at a licensed facility. Do not distribute, make available, furnish or reuse empty container except for storage and shipment of original product.

14. TRANSPORT INFORMATION

US Department of Transportation (DOT) Not classified as dangerous in the meaning of transport regulations.

UN Number

Proper shipping name

Primary hazard class/division

Packing group

Label

15. REGULATORY INFORMATION

SARA Section 311/312 Categories

Acute

SARA 302 Extremely Hazardous Substances

None Present ()

SARA 313 - Specific Toxic Chemical Listings

As supplied, no chemical in this product exceeds the de minimis reporting level established by SARA Title III, Section 313 and 40 CFR 372.

California Proposition 65

This product does not intentionally contain any chemicals known by the State of California to cause birth defects, cancer and/or other reproductive harm. Additionally, based on theoretical calculations using vendor toxicity data, it was determined that this product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a notification/action under the statute.

Notification status

All components of this product are included on or exempt from the following national chemical inventories:

United States (TSCA)
Canada (DSL)
Australia (AICS)
China (IECSC)
Korea (KECL)
Philippines (PICCS)
Japan (ENCS)
Europe (EINECS)

16. OTHER INFORMATION

HMIS Ratings	Health—1; Flammability—0; Reactivity—0
NFPA Codes	Health—1; Flammability—0; Reactivity—0; Special Hazard—None
Hazard Rating Scale	Minimal—0; Slight—1; Moderate—2; Serious—3; Severe—4
SDS Issue Date	January 18, 2018
Revision Date	Version 1

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Safety Data Sheet

Polytec PT-135

Revision Date 5/15/15

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Ferric Chloride Solution DWG Grade
UN/ID No. UN2582
Synonyms Iron (III) Chloride, Iron trichloride, FeCl₃
Recommended Use Water treatment chemical
Uses advised against Consumer uses: Private households (= general public = consumers).

Company Name

Polytec, Inc.
191 Barley Park Lane
Mooresville, NC 28115

24 Hour Emergency Phone Number CHEMTREC 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1

Emergency Overview

DANGER

Hazard statements

Causes severe skin burns and eye damage
Harmful if swallowed

Physical hazards

Corrosive
May be corrosive to metals



Precautionary statements

Prevention

- Wear eye/face protection
- Wear protective gloves/protective clothing/eye protection/face protection
- Do not breathe dust/fume/gas/mist/vapors/spray
- Do not eat, drink or smoke when using this product

Response

- Wash face, hands and any exposed skin thoroughly after handling
- Immediately call a POISON CENTER or doctor/physician
- Specific treatment (see section 4 on this Safety Data Sheet)

Storage

- Store in a secure area

Disposal

- Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC) None known.

Other Information

Other hazards

- Toxic to aquatic life with long lasting effects
- Toxic to aquatic life

Unknown Acute Toxicity

0.85% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	EC No.	Weight-% *
Water	7732-18-5	231-791-2	55-69
Iron trichloride	7705-08-0	231-729-4	31-45
Hydrogen chloride	7647-01-0	231-595-7	0.0-1.0
Ferrous chloride	7758-94-3	231-843-4	0.0-0.7

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

General advice	<ul style="list-style-type: none">• Immediate medical attention is required
Eye contact	<ul style="list-style-type: none">• Immediate medical attention is required• Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes• Do not rub affected area
Skin Contact	<ul style="list-style-type: none">• Immediate medical attention is required• Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes• Wash contaminated clothing before reuse
Inhalation	<ul style="list-style-type: none">• Call a physician or poison control center immediately• Remove to fresh air• If not breathing, give artificial respiration• If breathing is difficult, give oxygen
Ingestion	<ul style="list-style-type: none">• Call a physician or poison control center immediately• Do NOT induce vomiting• Rinse mouth• Drink 4 to 8 ounces (120-240 ml) of water or milk as soon as possible after ingestion.• Never give anything by mouth to an unconscious person
Note to physician	Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. Treat symptomatically.
Self-protection for first aid personnel	Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	<ul style="list-style-type: none">• Dry chemical, CO₂, water spray or alcohol-resistant foam• Use extinguishing measures that are appropriate to local circumstances and the surrounding environment
Unsuitable extinguishing media	<ul style="list-style-type: none">• Caution: Use of water spray when fighting fire may be inefficient• Do not use a solid water stream as it may scatter and spread fire
Specific hazards arising from the chemical	<ul style="list-style-type: none">• The product causes burns of eyes, skin and mucous membranes• Thermal decomposition can lead to release of irritating and toxic gases and vapors• In the event of fire and/or explosion, do not breathe fumes

Protective equipment and precautions for firefighters	<ul style="list-style-type: none"> • Wear a self-contained breathing apparatus and chemical protective clothing
Flammable properties	<ul style="list-style-type: none"> • No information available
Explosive properties	<ul style="list-style-type: none"> • No information available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	<ul style="list-style-type: none"> • Evacuate personnel to safe areas • Use personal protective equipment as required • Avoid contact with skin, eyes or clothing • Keep people away from and upwind of spill/leak
Environmental precautions	<ul style="list-style-type: none"> • For small spills, absorb material with clay absorbent or other compatible material. Dispose of the waste material according to local, state and governmental requirements. • For large spills, contain the material using barriers of absorbent pigs, clay absorbent or earth dams. • US regulations require reporting spills of this material that could reach any surface waters. The toll-free phone number for the US Coast Guard National Response Center is 1-800-424-8802
Methods for cleaning up	<ul style="list-style-type: none"> • Neutralize with soda ash or lime • Take up mechanically, placing in appropriate containers for disposal • Clean contaminated surface thoroughly • Soak up with inert absorbent material
Other Information	<ul style="list-style-type: none"> • Spills exceeding the Reportable Quantity (RQ) of 1000 pounds or more must be reported to the National Response Center, (800) 424-8802.

7. HANDLING AND STORAGE

Advice on safe handling	<ul style="list-style-type: none"> • Use personal protective equipment as required • Avoid contact with skin, eyes or clothing • Ensure adequate ventilation, especially in confined areas • In case of insufficient ventilation, wear suitable respiratory equipment • Use only with adequate ventilation and in closed systems
Storage Conditions	<ul style="list-style-type: none"> • Keep container tightly closed in a dry and well-ventilated place • Keep out of the reach of children • Keep containers tightly closed in a dry, cool and well-ventilated place • Keep in properly labeled containers
Incompatible materials	Incompatible with strong acids and bases, oxidizers, steel, and most metals

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Iron trichloride 7705-08-0	TWA: 1 mg/m ³ Fe	-	TWA: 1 mg/m ³ Fe
Hydrogen chloride 7647-01-0	Ceiling: 2 ppm	Ceiling: 5 ppm Ceiling: 7 mg/m ³	IDLH: 50 ppm Ceiling: 5 ppm Ceiling: 7 mg/m ³
Ferrous chloride 7758-94-3	TWA: 1 mg/m ³ Fe	(vacated) TWA: 1 mg/m ³ Fe	TWA: 1 mg/m ³ Fe

Exposure Guidelines

Engineering Controls	Ensure adequate ventilation, especially in confined areas.
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Individual protection measures, such as personal protective equipment

Respiratory protection	<ul style="list-style-type: none"> • A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant the use of a respirator.
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Eye/Face protection	<ul style="list-style-type: none"> • Tight sealing safety goggles • Face protection shield
Skin and body protection	<ul style="list-style-type: none"> • Wear suitable protective clothing • Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact
General Hygiene Considerations	<ul style="list-style-type: none"> • Do not eat, drink or smoke when using this product • Wash contaminated clothing before reuse • Contaminated work clothing should not be allowed out of the workplace • Regular cleaning of equipment, work area and clothing is recommended • Avoid contact with skin, eyes or clothing

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Clear to slightly hazy
Color	Red brown
Odor	Slight Iron acidic
Odor threshold	No information available

Property	Values	Remarks • Method
pH	<2	
Melting point/Freezing Point	-26 °C / -15 °F	
Boiling point / boiling range	110 °C / 230 °F	
Flash point	No information available	
Evaporation rate	<1	n-Butyl acetate =1
Flammability (solid, gas)	No information available	
Flammability Limit in Air		Not flammable
Upper flammability limit (%)	No information available	
Lower flammability limit (%):	No information available	
Vapor pressure	No information available	negligible
Vapor density	No information available	
Specific Gravity	1.40	
Water solubility	Miscible in water	
Solubility in other solvents	No information available	
Partition coefficient	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Explosive properties	No information available	
Oxidizing properties	No information available	

Other Information

Softening point °C	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Density	No information available
Bulk density	11.7 Pounds per gallon (lb/gal), Typical

10. STABILITY AND REACTIVITY

Stability	<ul style="list-style-type: none"> • Stable under recommended storage conditions
Conditions to avoid	<ul style="list-style-type: none"> • Exposure to air or moisture over prolonged periods
Incompatible materials	<ul style="list-style-type: none"> • Incompatible with strong acids and bases, oxidizers, steel, and most metals

Hazardous Decomposition Products • Thermal decomposition can lead to release of irritating and toxic gases and vapors

Possibility of Hazardous Reactions • None under normal processing and storage

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principle Routes of Exposure Inhalation Skin Contact Eye contact
Inhalation May cause irritation of respiratory tract. Avoid breathing vapors or mists.
Ingestion May cause adverse kidney effects. May cause adverse liver effects.
Skin Contact Contact causes severe skin irritation and possible burns.
Eye contact Corrosive to the eyes and may cause severe damage including blindness.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Iron trichloride 7705-08-0	= 450 mg/kg (Rat)	>2000 mg/kg (rat)	-
Hydrogen chloride 7647-01-0	= 700 mg/kg (Rat)	> 5010 mg/kg (Rabbit)	= 3124 ppm (Rat) 1 h
Ferrous chloride 7758-94-3	450	-	-

Information on toxicological effects

Symptoms Vomiting, Hypoxemia (reduced O₂ in the blood), Metabolic Acidosis

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization No information available.
Germ cell mutagenicity No information available.
Carcinogenicity No information available.

Chemical Name	ACGIH	IARC	NTP	OSHA
Hydrogen chloride 7647-01-0	-	Group 3	-	-

Reproductive toxicity No information available.
STOT - single exposure No information available.
STOT - repeated exposure No information available.
Chronic toxicity Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen. Avoid repeated exposure. Possible risk of irreversible effects. May cause adverse liver effects.
Target Organ Effects Eyes, Gastrointestinal tract (GI), Liver, Respiratory system, Skin.
Aspiration hazard No information available.

Numerical measures of toxicity - Product Information

Unknown Acute Toxicity 0.85% of the mixture consists of ingredient(s) of unknown toxicity
The following values are calculated based on chapter 3.1 of the GHS document . mg/kg

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity Toxic to aquatic life with long lasting effects
0.85% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Chemical Name	Algae/aquatic plants	Fish	Crustacea
Iron trichloride 7705-08-0	-	20.95 - 22.56: 96 h Pimephales promelas mg/L LC50 semi-static 20.26: 96 h Lepomis macrochirus mg/L LC50 semi-static	27.9: 48 h Daphnia magna mg/L EC50 9.6: 48 h Daphnia magna mg/L EC50 Static

Persistence and degradability No information available.
Bioaccumulation No information available

SDS -Ferric Chloride Solution DWG Grade

Chemical Name	Partition coefficient
Iron trichloride 7705-08-0	-4

Other adverse effects No information available

13. DISPOSAL CONSIDERATIONS

Disposal of wastes • This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261)

Contaminated packaging • Do not reuse container

US EPA Waste Number • D002

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste Status
Iron trichloride 7705-08-0	Toxic Corrosive

14. TRANSPORT INFORMATION

DOT

Proper shipping name FERRIC CHLORIDE, SOLUTION

Hazard Class 8

UN/ID No. UN2582

Packing Group III

RQ (lbs)(dry) 1000

RQ as is (lbs)(wet) 2222 (45% Ferric Chloride)

Description UN2582, Ferric chloride, solution, 8, III

Special Provisions B15, IB3, T4, TP1

Emergency Response Guide Number 154

IATA

UN/ID No. UN2582

Proper shipping name FERRIC CHLORIDE SOLUTION

Hazard Class 8

Packing Group III

ERG Code 8L

Special Provisions A3

IMDG

UN/ID No. UN2582

Proper shipping name FERRIC CHLORIDE, SOLUTION

Hazard Class 8

Packing Group III

EmS-No. F-A, S-B

Special Provisions 223

15. REGULATORY INFORMATION

US Federal Regulations

SARA 311/312 Hazard Categories

Acute health hazard Yes

Chronic Health Hazard Yes

Fire hazard No

Sudden release of pressure hazard No

Reactive Hazard No

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SDS - Ferric Chloride Solution DWG Grade

CWA (Clean Water Act) This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Iron trichloride 7705-08-0	1000 lb	-	-	X
Hydrogen chloride 7647-01-0	5000 lb	-	-	X
Ferrous chloride 7758-94-3	100 lb	-	-	X

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	RQ (lbs)(dry)
Iron trichloride 7705-08-0	1000 lb	-	RQ 1000 lb final RQ RQ 454 kg final RQ
Hydrogen chloride 7647-01-0	5000 lb	5000 lb	RQ 5000 lb final RQ RQ 2270 kg final RQ
Ferrous chloride 7758-94-3	100 lb	-	RQ 100 lb final RQ RQ 45.4 kg final RQ

US State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Iron trichloride 7705-08-0	X	X	X
Ferrous chloride 7758-94-3	X	X	X

Chemical Name	U.S. - DEA - List I or Precursor Chemicals	U.S.- DEA - List II or Essential Chemicals
Hydrogen chloride 7647-01-0	-	50 gallon, Export Volume 27 kg, Export Weight 0 kg, Domestic Sales Weight

International Inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Does not comply
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

16. OTHER INFORMATION

SDS - Ferric Chloride Solution DWG Grade

<u>NFPA</u>	Health hazards	3	Flammability	0	Instability	0	Physical and Chemical Properties	-
<u>HMIS</u>	Health hazards	3	Flammability	0	Physical hazards	0	Personal protection	D
Issue Date	5/15/2015							
Version	1							

Disclaimer

All information, statements, data, advice, and/or recommendations, including, without limitation, those relating to storage, loading/unloading, piping, and transportation (collectively referred to herein as "information") are believed to be accurate, reliable, and based on reliable industry and regulatory references. However, no representation or warranty, express or implied, is made as to its completeness, accuracy, fitness for a particular purpose or any other matter, including, without limitation, that the practice or application of any such information is free of patent infringement or other intellectual property misappropriation. The Company providing this SDS is not engaged in the business of providing technical, operational, engineering, or safety information for a fee, and therefore, any such information provided herein has been furnished as an accommodation and without charge. All information provided herein is intended for use by persons having requisite knowledge, skill, and experience in the chemical industry. The Company providing this SDS shall not be responsible or liable for the use, application, or implementation of the information provided herein, and all such information is to be used at the risk, and in the sole judgment and discretion of such persons, their employees, advisors, and agents. This safety data sheet (SDS) is offered for your information, consideration, and investigation as required by federal hazardous products act and related legislation.

End of Safety Data Sheet

SAFETY DATA SHEET

POLYTEC PT-180

Section 1. Identification

GHS product identifier : ALUMINUM CHLORHYDRATE SOLUTION & POLYMER BLEND

Other means of identification : Not available.

Relevant identified uses of the substance or mixture and uses advised against

Not available.

Supplier's details : Polytec, Inc.
191 Barley Park Lane
Mooresville, NC 28115
704-660-5195

e-mail address of person responsible for this MSDS: customerservice@polytecinc.net

Emergency telephone number : CHEMTREC, U.S. : 1-800-424-9300 International: +1-703-527-3887
CCN# 17585

Section 2. Hazards identification

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture : Not classified.

GHS label elements

Signal word : No signal word.

Hazard statements : No known significant effects or critical hazards.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : Not applicable.

Disposal : Not applicable.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture: Mixture

Other means of: Not available.

Identification:

CAS number/other identifiers

<u>Typical Composition</u>	<u>CAS #'s</u>	<u>%</u>
Aluminum Chlorohydrate	12042-91-0	50
Water	7732-18-5	Balance

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
Inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Skin contact	: Flush contaminated skin with plenty of water. Get medical attention if symptoms occur.
Ingestion	: Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	: No known significant effects or critical hazards.
Inhalation	: No known significant effects or critical hazards.
Skin contact	: No known significant effects or critical hazards.
Ingestion	: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	: No known significant effects or critical hazards.
Inhalation	: No known significant effects or critical hazards.
Skin contact	: No known significant effects or critical hazards.
Ingestion	: No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: No specific treatment.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training.

Section 4. First aid measures

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : No specific fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
halogenated compounds
metal oxide/oxides

Special protective actions for fire-fighters : No special measures are required.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Spill : Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8).
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

- Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Section 8. Exposure controls/personal protection

Respiratory protection : Use a properly fitted, air-purifying or supplied air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Colorless to light yellow.

Odor : None

Odor threshold : Not available.

pH : 4 to 5

Melting point : -7°C (19.4°F)

Boiling point : 110°C (230°F)

Flash point : Not applicable.

Burning time : Not applicable.

Burning rate : Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : 1 [Air = 1]

Relative density : 1.33 to 1.35

Solubility : Easily soluble in the following materials: cold water and hot water.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Section 10. Stability and reactivity

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials and metals.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

There is no data available.

Irritation/Corrosion

Skin : There is no data available.

Eyes : There is no data available.

Respiratory : There is no data available.

Sensitization

Skin : There is no data available.

Respiratory : There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

There is no data available.

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

There is no data available.

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Section 11. Toxicological information

Eye contact	: No known significant effects or critical hazards.
Inhalation	: No known significant effects or critical hazards.
Skin contact	: No known significant effects or critical hazards.
Ingestion	: No known significant effects or critical hazards.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects	: No known significant effects or critical hazards.
Potential delayed effects	: No known significant effects or critical hazards.

Long term exposure

Potential immediate effects	: No known significant effects or critical hazards.
Potential delayed effects	: No known significant effects or critical hazards.

Potential chronic health effects

General	: No known significant effects or critical hazards.
Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

There is no data available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Aluminium Chlorohydrate Solution	Chronic EC50 6999 mg/L Chronic LC50 3623 mg/L	Daphnia - Daphnia magna Fish - Fathead Minnow	- -

Persistence and degradability

There is no data available.

Bioaccumulative potential

There is no data available.

Mobility in soil

Section 12. Ecological information

Soil/water partition coefficient (K_{oc}) : -2.49

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Additional information	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Not applicable.

Composition/information on ingredients

No products were found.

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : None of the components are listed.

Pennsylvania : The following components are listed: Dialuminium Chloride Pentahydroxide

California Prop. 65

No products were found.

International regulations

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: Not determined.
Korea inventory: All components are listed or exempted.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Taiwan inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Section 15. Regulatory information

Chemical Weapons : Not listed
Convention List Schedule
II Chemicals

Chemical Weapons : Not listed
Convention List Schedule
III Chemicals

Section 16. Other information

History

Date of issue mm/dd/yyyy : 06/15/2014
Version : 1
Revised Section(s) : Not applicable.
Prepared by : KMK Regulatory Services Inc.
Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships,
1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY

Product name: Polytec PT-516

Company: Polytec, Inc.
191 Barley Park Lane
Mooresville, NC 28115

Telephone: 704-660-5195
Telefax: 704-662-3498
E-mail: customerservice@polytecinc.net

Emergency telephone number: 800-424-9300 CHEMTREC (CCN 17585), Outside U.S. 703-527-3887

Product Use: Processing aid for industrial applications.

2. HAZARDS IDENTIFICATION

Appearance and Odor:

Form: Viscous liquid

Color: Milky

Odor: Aliphatic

Potential Health Effects:
See Section 11 for more information.

Eye: May cause slight irritation.

Potential Physical/Chemical Effects:
Spills produce extremely slippery surfaces.

OSHA Regulatory Status:
This material is not considered hazardous in accordance with OSHA 29 CFR 1910.1200.

Potential Environmental Effects:
None. See Section 12 for more information.

Other information No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Identification:

anionic water-soluble polymer in emulsion

Regulated Components:

Chemical Name	CAS Number:	Concentration/ -range:
Distillates (petroleum), hydrotreated light	64742-47-8	20 - 45%
Poly(oxy-1,2-ethanediyl), a-tridecyl-w-hydroxy-, branched	69011-36-5	< 5%

4. FIRST AID MEASURES

Inhalation: Move to fresh air immediately.

Skin contact: Wash off immediately with soap and plenty of water. In case of persistent skin irritation, consult a physician.

Eye contact: Rinse thoroughly with plenty of water, also under the eyelids. Get medical attention.

Ingestion: Rinse mouth with water. Do not induce vomiting. Call a physician immediately.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Carbon dioxide (CO₂). Dry powder. Water. Water spray. Foam.

Unsuitable extinguishing media: None.

Precautions: Spills produce extremely slippery surfaces.

Special protective equipment for firefighters: Wear self-contained breathing apparatus and protective suit.

Specific methods: Keep personnel removed and upwind of fire.

Specific hazards: In the event of fire the following can be released: Carbon Oxides. Nitrogen Oxides. Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combustion in an oxygen deficient atmosphere.

Flash point (°C): Does not flash.

Autoignition temperature (°C): Not determined.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: No special precautions required. Wear adequate personal protective equipment (see Section 8 Exposure Controls/Personal Protection). Spills produce extremely slippery surfaces. Keep people away from spill/leak.

Environmental precautions: As with all chemical products, do not flush into surface water.

Methods for cleaning up: Do not flush with water. Dam up. Soak up with inert absorbent material. If liquid has been spilt in large quantities clean up promptly by scoop or vacuum. Keep in suitable and closed containers for disposal. After cleaning, flush away traces with water.

7. HANDLING AND STORAGE

Handling: Avoid contact with skin and eyes. When preparing the working solution ensure there is adequate ventilation. When using do not smoke. Wear adequate personal protective equipment (see Section 8 Exposure Controls/Personal Protection).

Storage: Keep in a dry cool place (0 - 30 °C). Keep away from heat and sources of ignition. Freezing will affect the physical condition and may damage the material.

Technical measures/Precautions: No special precautions required.

Incompatible products: Oxidizing agents may cause exothermic reactions.

Technical measures/Storage conditions: No special storage conditions required.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Use local exhaust if misting occurs. Natural ventilation is adequate in absence of mists.

Personal protective equipment:

Respiratory protection: Not required ; except in case of aerosol formation.

Hand protection: PVC or other plastic material gloves.

Eye protection: Safety glasses with side-shields. Do not wear contact lenses where this product is used.

Skin and body protection: Chemical resistant apron or protective suit if splashing or repeated contact with solution is likely.

Hygiene measures: Wash hands before breaks and at the end of workday. When using do not eat, drink or smoke. Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Viscous liquid
Color:	Milky
Odor:	Aliphatic
pH:	5 - 8 @ 5 g/L
Specific Gravity:	1.0 - 1.1
Melting point/range (°C):	< 5
Flash point (°C):	Does not flash.
Boiling point (°C):	> 100
Autoignition temperature (°C):	Not determined.
Vapor pressure (mm Hg):	2.3 kPa @ 20°C
Viscosity (mPa.s):	See Technical Bulletin
Water solubility:	Completely miscible
LogPow:	Not applicable.
Kinematic viscosity @ 40°C (mm²/s):	> 20.5

10. STABILITY AND REACTIVITY

Conditions to avoid: Avoid extremes of temperature. Protect from light, moisture and damage.

Stability: Stable. Hazardous polymerisation does not occur.

Materials to avoid: Oxidizing agents may cause exothermic reactions.

Hazardous decomposition products: Thermal decomposition may produce: nitrogen oxides (NO_x), carbon oxides (CO_x), hydrogen cyanide (hydrocyanic acid).

11. TOXICOLOGICAL INFORMATION

Product Information

Acute toxicity:

Oral: LD50/oral/rat > 5000 mg/kg

Dermal: LD50/dermal/rat > 5000 mg/kg

Inhalation: The product is not expected to be toxic by inhalation.

Irritation:

Skin: Not irritating.

Eyes: May cause slight eye irritation.

Sensitization: Not sensitizing.

Mutagenicity: Not mutagenic.

Carcinogenicity: Not carcinogenic.

Reproductive effects: Not toxic for reproduction.

Chronic toxicity: No chronic effects.

Other information: Due to the viscosity, this product does not present an aspiration hazard.

Component Information

Distillates (petroleum), hydrotreated light

Acute toxicity:

Oral: LD50/oral/rat > 5000 mg/kg (OECD 401)

Dermal: LD50/dermal/rabbit > 5000 mg/kg (OECD 402)

Inhalation: LC50/inhalation/4 h/rat = 4951 mg/m³ (OECD 403)

Irritation:

Skin: Not irritating. (OECD 404) Repeated exposure may cause skin dryness or cracking

Eyes: Not irritating. (OECD 405)

Sensitization: By analogy with similar products, this product is not expected to be sensitizing. (OECD 406)

Mutagenicity: Not mutagenic. (OECD 471, 473, 474, 476, 478, 479)

Carcinogenicity: Carcinogenicity study in rats (OECD 451): Negative

Reproductive effects: By analogy with similar substances, this substance is not expected to be toxic for reproduction.
NOAEL/rat = 300 ppm (OECD 421)

Chronic toxicity: No chronic effects.

Other information: May be fatal if swallowed and enters airways.

Poly(oxy-1,2-ethanediyl), a-tridecyl-w-hydroxy-, branched

Acute toxicity:

Oral: LD50/oral/rat = 200 - 300 mg/kg

Dermal: LD50/dermal/rabbit > 2000 mg/kg

Inhalation: No data available.

Irritation:

Skin: Not irritating.

Eyes: Causes serious eye irritation

Sensitization: The results of testing on guinea pigs showed this material to be non-sensitizing.

Mutagenicity: Not mutagenic.

Carcinogenicity: Not carcinogenic.

Reproductive effects: Two-Generation Reproduction Toxicity (OECD 416)
NOAEL/rat > 250 mg/kg/day Prenatal Development Toxicity Study (OECD 414)
NOAEL/Maternal toxicity/rat > 50 mg/kg/day
NOAEL/Developmental toxicity/rat > 50 mg/kg/day

Chronic toxicity: NOAEL/oral/rat/600 days = 50 mg/kg/day

12. ECOLOGICAL INFORMATION

Product Information

Aquatic toxicity:

Toxicity to fish: LC50/Fish/96 hours > 100 mg/L

Toxicity to daphnia: EC50/Daphnia/48 hours > 100 mg/L

Toxicity to algae: IC50/Algae/72 hours > 100 mg/L

Environmental fate:

Persistence and degradability: Not readily biodegradable.

Hydrolysis: Does not hydrolyse.

Bioaccumulation: The product is not expected to bioaccumulate.

LogPow: Not applicable.

LogKow: Not determined.

Component Information

Distillates (petroleum), hydrotreated light

Acute toxicity to fish:

Toxicity to fish: LC0/Oncorhynchus mykiss/96 hours > 1000 mg/L (OECD 203)

Toxicity to daphnia: EC0/Daphnia magna/48 hours > 1000 mg/L (OECD 202)

Toxicity to algae: IC0/Pseudokirchneriella subcapitata/72 hours > 1000 mg/L (OECD 201)

Environmental fate:

Persistence and degradability: Readily biodegradable.

Hydrolysis: Does not hydrolyse.

Bioaccumulation: The product is not expected to bioaccumulate.

LogPow: 3 - 6

LogKow: Not determined.

Poly(oxy-1,2-ethanediyl), a-tridecyl-w-hydroxy-, branched

Toxicity to fish: LC50/Cyprinus carpio/96 hours = 1 - 10 mg/L (OECD 203)

Toxicity to daphnia: EC50/Daphnia/48 hours = 1 - 10 mg/L (OECD 202)

Toxicity to algae: IC50/Desmodesmus subspicatus/72 hours = 1 - 10 mg/L (OECD 201)

Environmental fate:

Persistence and degradability: Readily biodegradable. > 60% / 28 days (OECD 301 B)

Hydrolysis: Does not hydrolyse.

Bioaccumulation: No data available

LogPow: > 3

LogKow: Koc > 5000

13. DISPOSAL CONSIDERATIONS

Disposal: Dispose of in accordance with local, state and federal regulations.

Container: Rinse empty containers with water and use the rinse water to prepare the working solution. Can be landfilled or incinerated, when in compliance with local, state and federal regulations.

14. TRANSPORT INFORMATION

DOT:

Not classified as dangerous in the meaning of DOT regulations.

IMDG/IMO:

Not classified as dangerous in the meaning of IMO/IMDG regulations.

ICAO/IATA:

Not classified as dangerous in the meaning of ICAO/IATA regulations.

15. REGULATORY INFORMATION

Product Information

US SARA Reporting Requirements: None.

RCRA status : Not RCRA hazardous.

SARA (Section 311/312) hazard class: Not concerned.

California Proposition 65 Information: WARNING! This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm, Acrylamide.

International Inventories:

USA (TSCA): All components of this product are either listed on the inventory or are exempt from listing.

Canada (DSL): All components of this product are either listed on the inventory or are exempt from listing.

China (IECSC): All components of this product are either listed on the inventory or are exempt from listing.

European Union (REACH): All components of this product have been registered or pre-registered with the European Chemicals Agency or are exempt from registration.

Australia (AICS): All components of this product are either listed on the inventory or are exempt from listing.

Japan (ENCS): All components of this product are either listed on the inventory or are exempt from listing.

Korea (ECL): All components of this product are either listed on the inventory or are exempt from listing.

Philippines (PICCS): All components of this product are either listed on the inventory or are exempt from listing.

Taiwan (CSNN): All components of this product are either listed on the inventory or are exempt from listing.

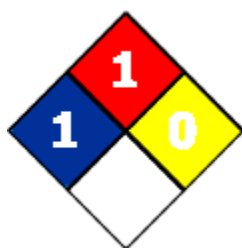
New Zealand (NZIoC): All components of this product are either listed on the inventory or are exempt from listing.

16. OTHER INFORMATION

NFPA and HMIS Ratings :

NFPA:

Health:	1
Flammability:	1
Instability:	0



HMIS:

Health:	1
Flammability:	1
Physical Hazard:	0
PPE Code:	B

This MSDS was prepared in accordance with the following:

ISO 11014-1: Material Safety Data Sheet for Chemical Products

ANSI Z400.1-2004; Material Safety Data Sheets - Preparation

Revision Number: 14.01a

ENAC001

The data in this Material Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained. This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.



SAFETY DATA SHEET

COMPANY IDENTITY: EP CHEMICAL
PRODUCT IDENTITY: HACHA

SDS DATE: 05/01/2023

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System.

THIS SDS COMPLIES WITH CFR 1910.1200 (HAZARD COMMUNICATIONS STANDARD)

IMPORTANT: Read this SDS before handling & disposing of this product.

Pass this information on to employees, customers, & users of this product.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

PRODUCT IDENTITY: HACHA
SDS NUMBER: CR8254
COMPANY IDENTITY: EP CHEMICAL
COMPANY ADDRESS: 591 J ST WASCO, CA. 93280
COMPANY PHONE: 800-767-9112
EMERGENCY PHONES: CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (CANADA)



SECTION 2. HAZARDS IDENTIFICATION

HAZARD STATEMENTS:

H100s = General, H200s = Physical, H300 = Health, H400s = Environmental

H315 May cause skin irritation.
H320 Causes eye irritation.
H335 Inhalation of mist may cause mucous membrane and respiratory irritation.

PRECAUTIONARY STATEMENTS:

P100s = General, P200s = Prevention, P300s = Response, P400s = Storage, P500s = Disposal

P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present & easy to do – Continue rinsing.
P309+311 If exposed or you feel unwell: Call a POISON CENTER or doctor/physician.
P405+102 Store locked up. Keep out of reach of children.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL	CAS#
Water	7732-18-5
Aluminum Chlorhydrate	12042-91-0
Proprietary Compound	-----



Trace components: Trace ingredients (if any) are present in < 1% concentration, (< 0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant Additional hazards at the concentrations that may be present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalents, and Canadian Hazardous Materials Identification System Standard (CPR 4).

SECTION 4. FIRST AID MEASURES

EYE CONTACT:

If this product enters the eyes, open eyes while under gently running water. Use sufficient force to open eyelids. Roll eyes to expose more surface. Minimum flushing is for 15 minutes. Seek immediate medical attention.

SKIN CONTACT:

If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove contaminated clothing, taking care not to contaminate eyes. If skin becomes irritated and irritation persists, medical attention may be necessary. Wash contaminated clothing before reuse, discard contaminated shoes.

INHALATION:

Move person to fresh air, if effects occur, consult a physician.

SWALLOWING:

If swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, give two glasses of water to drink. **DO NOT INDUCE VOMITING.** Never induce vomiting or give liquids to someone who is unconscious, having convulsions, or unable to swallow. Seek immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Any material aspirated during vomiting may cause lung injury. Therefore, emesis Should be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (such as: Gastric lavage after endotracheal intubation). Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of the label and SDS to physician or health professional with victim.

SECTION 5. FIRE FIGHTING MEASURES

FIRE & EXPLOSIONS PREVENTIVE MEASURES: None.

EXTINGUISHING MEDIA:

Use media appropriate for surrounding fire. Cool fire exposed containers and structures with water.

SPECIAL FIRE FIGHTING PROCEDURES: None.

UNUSUAL EXPLOSION AND FIRE PROCEDURES: None.

FLASH POINT: None.

AUTOIGNITION TEMPERATURE: None.



SECTION 6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE AND ENVIRONMENTAL PRECAUTIONS:

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel.

PERSONAL PRECAUTIONS:

Spilled material may cause a slipping hazard. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment.

ENVIRONMENTAL PRECAUTIONS:

Stop spill at source. Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material. Close or cap valves and/or block or plug hole in leaking container and transfer to another container, keep from entering storm sewers and ditches which lead to waterways, and if necessary, call the local fire or police department for immediate emergency assistance.

CONTAINMENT AND CLEAN-UP MEASURES:

Absorb spilled liquid with poly pads or other suitable absorbent materials. Clean up with non-combustible absorbent (such as: sand, soil, and so on). Shovel up and place all spill residue in suitable containers. Dispose of at an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal (see Section 13- Disposal Considerations).

SECTION 7. HANDLING AND STORAGE

HANDLING:

Product shipped/handled hot can cause thermal burns. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling.

STORAGE:

Store in a cool, dry, well-ventilated area away from heat and incompatible materials. Protect from physical damage.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

MATERIAL	CAS#	TWA (OSHA)	TLV (ACGIH)
Water	7732-18-15	None Known	None Known
Aluminum Chlorhydrate	12042-91-0	2 mg/m ³	2 mg/m ³
Proprietary Compound	-----	None Known	None Known

MATERIAL	CAS#	CEILING	STEL (OSHA/ACGIH)	HAP
Aluminum Chlorhydrate	12042-91-0	N/A	None Known	No

This product contains no EPA Hazardous Air Pollutants (HAP) in amounts > 0.1%.

RESPIRATORY EXPOSURE CONTROLS:

A respiratory protective program that meets OSHA CFR 1910.134 and ANSI Z86.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**VENTILATION:**

LOCAL EXHAUST: None

MECHANICAL (General): None

SPECIAL: None

OTHER: None

Please refer to ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL PROTECTION:

Wear OSHA Standard full face shield. Consult Safety Equipment Supplier. Wear goggles, face shield, gloves, apron & footwear impervious to material. Wash clothing before reuse.

WORK & HYGIENIC PRACTICES:

Provide readily accessible eye wash stations & safety showers. Wash at the end of each work shift & before eating, smoking or using the toilet. Promptly remove clothing that becomes contaminated. Destroy contaminated leather articles. Launder or discard contaminated clothing.

SECTION 9. PHYSICAL & CHEMICAL PROPERTIES:

APPEARANCE:	Clear to straw colored liquid.
ODOR:	Odorless
ODOR THRESHOLD:	Not Available
pH (Neutrality):	3.5-4.5
MELTING POINT/FREEZING POINT:	-16°C
BOILING RANGE (IBP, 50%, Dry Point):	101°C (212°F)
FLASH POINT (TEST METHOD):	None
EVAPORATION RATE (n-BUTYL ACETATE=1):	Not Applicable
FLAMMABILITY CLASSIFICATION:	Non-Combustible
LOWER FLAMMABLE LIMIT IN AIR (% by vol):	Not Applicable
UPPER FLAMMABLE LIMIT IN AIR (% by vol):	Not Available
VAPOR PRESSURE (mm of Hg)@20 C:	Not Available
VAPOR DENSITY (air = 1):	Not Available
SPECIFIC GRAVITY (Water = 1):	1.33-1.36
POUNDS/GALLON:	11.259
WATER SOLUBILITY:	Complete
VISCOSITY (mPa.s):	N/A
AUTO IGNITION TEMPERATURE:	None
DECOMPOSITION TEMPERAURE:	Not Available

SECTION 10. STABILITY & REACTIVITY**STABILITY:**

Stable under most conditions.

CONDITIONS TO AVOID:

Isolate from extreme heat, and open flame.

MATERIALS TO AVOID:

Oxidizing materials can cause a reaction. Caustics will precipitate aluminum hydroxide.

HAZARDOUS DECOMPOSITION PRODUCTS:

Chlorine compounds, metal oxides.



HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

No Data Available

CONDITIONS AGGRAVATED:

None Known.

CHRONIC HAZARDS

CHRONIC TOXICITY:

In animals, effects have been reported on the following organs after ingestions: Gastrointestinal tract, heart, and kidney. Does levels producing these effects were many times a strong association between elevated blood pressure and prolonged dietary overuse. Related effects could occur in the kidneys.

CARCINOGENICITY:

This product is not classified as a carcinogen by NTP, IARC or OSHA.

MUTAGENIC DATA:

In vitro genetic toxicity studies were negative.

DEVELOPMENTAL TOXICITY:

Did not cause birth defects or any other fetal effects in laboratory animals.

SECTION 12. ECOLOGICAL INFORMATION

PIMELPHALES PROMELAS:

LC50/HRS: 1056 mg/L 24 hrs. 832 mg/L 48 hrs. 684 mg/L 72 hrs. 609 mg/L 96 hrs.

DAPHNIA MAGNA:

LC50/HRS: 642 mg/L 24 hrs. 397 mg/L 48 hrs.

BIOACCUMULATION:

Does not bioaccumulate.

SECTION 13. DISPOSAL CONSIDERATIONS

Processing, use or contamination may change the waste management options. Recycle / dispose of observing national, regional, state, provincial and local health, safety & pollution laws. If in doubt, contact appropriate agencies.



6/7HACHA

SECTION 14. TRANSPORT INFORMATION

UN/NA: N/A

Classification: NON-REGULATED

Proper Shipping Name: LIQUID NON-REGULATED

D.O.T Hazard Name (49CFR 172.101): NONE

D.O.T. ID Number (49CFR 172.101): NONE

D.O.T. Hazard Class (49CFR 172.101): Non D.O.T. Regulated

RCRA Hazard Class (40cfr261) (If discarded): NONE

E.P.A. Priority pollutants (40CFR 122.53): NONE

HAZARD RATINGS:

HEALTH (NFPA): 1, HEALTH (HMIS): 1, FLAMMABILITY: 0, PHYSICAL HAZARD: 0

(Personal Protection Rating to be supplied by user based on use conditions.)

This information is intended solely for the use of individuals trained in the NFPA & HMIS hazard rating system.

SECTION 15. REGULATORY INFORMATION:

TSCA Chemical Substances Inventory:

All components of this product are either listed on the inventory or exempt from listing.

California Proposition 65 Information:

This product contains no listed substances known to the state of California to cause cancer, birth defects or other reproductive harm.



NOTICE

All information, recommendations, and suggestions appearing herein concerning this product are based upon data obtained from the manufacturer and/or recognized technical sources; however, EP CHEMICAL makes no warranty, representation, or guaranty as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling, and disposal of the product. Additional product literature may be available upon request. Since actual use by others is beyond our control, no warranty, express or implied is made by EP CHEMICAL as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does EP CHEMICAL assume any liability arising out of use by others of this product.

[Back to HS-200 page](#)

HS-200

Media to Remove Oil, Heavy Metals and Similar Organics from Water Safety Data Sheet

Revision date : 2017

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 - Product Identifier

Product Name: HS-200

1.2 - Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Filtration

1.3 - Details of the supplier of the safety data sheet

Hydrosil International Ltd.
125 Prairie Lake Rd
East Dundee, IL 60118

T 847-844-0680 - F 847-844-0799
www.hydrosilintl.com

1.4 - Emergency telephone number

Emergency number : 1-847-844-0680

Section 2: Hazards Identification

2.1 - Classification of the substance or mixture

GHS-US classification
Eye Dam. 1 H318
STOT SE 3 H335

2.2 - Label Elements

GHS-US labeling
Hazard pictograms (GHS-US) :



Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :

H318 - Causes serious eye damage
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) :

P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER/doctor/...
P312 - Call a POISON CENTER/doctor/.../if you feel unwell
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to ...

2.3 - Other Hazards

No additional information available

2.4 - Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1 - Substances

Not applicable

3.2 - Mixture

Name	Product Identifier	%	GHS-US Classification
Zeolite	(CAS No.) 1318-02-1	85.2 - 86.2	STOT SE 3, H335
Water	(CAS No.) 7732-18-5	8.4 - 11.4	Not classified
N,N,N-Trimethyl-1-hexadecanaminium chloride	(CAS No.) 112-02-7	3.4 - 5.4	Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 1, H400

SECTION 4: First aid measures

4.1 - Description of first aid measures

First-aid measures after inhalation : Remove person to fresh air. If not breathing, administer CPR or artificial respiration. Get immediate medical attention.

First-aid measures after skin contact : If skin reddening or irritation develops, seek medical attention.

First-aid measures after eye contact : Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists get medical attention.

First-aid measures after ingestion : If the material is swallowed, get immediate medical attention or advice. DO NOT induce vomiting unless directed to do so by medical personnel.

4.2 - Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : May cause respiratory irritation.

Symptoms/injuries after skin contact : Causes skin irritation.

Symptoms/injuries after eye contact : Causes serious eye irritation.

Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3 - Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1 - Extinguishing media

Suitable extinguishing media : If involved with fire, flood with plenty of water.

Unsuitable extinguishing media : None.

5.2 - Special hazards arising from the substance or mixture

Fire hazard : None known.

Explosion hazard : None known.

5.3 - Advice for firefighters

Protection during firefighting : Firefighters should wear full protective gear.

SECTION 6: Accidental release measures

6.1 - Personal precautions, protective equipment and emergency procedures

General measures : Avoid contact with the skin and the eyes.

For non-emergency personnel : No additional information available

For emergency responders : No additional information available

6.2 - Environmental precautions

None.

6.3 - Methods and material for containment and cleaning up

For containment : If possible, stop flow of product.

Methods for cleaning up : Shovel or sweep up and put in a closed container for disposal.

6.4 - Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1 - Precautions for safe handling

Precautions for safe handling : Wet carbon/coal removes oxygen from air causing a severe hazard to workers inside carbon vessels or confined spaces.

7.2 - Conditions for safe storage, including any incompatibilities

Storage conditions : Protect containers from physical damage. Store in dry, cool, well-ventilated area.

7.3 - Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1 - Control parameters

No additional information available

8.2 - Exposure controls

Appropriate engineering controls : Local exhaust and general ventilation must be adequate to meet exposure standards.

Hand protection : Use impervious gloves.

Eye protection : Safety glasses.

Skin and body protection : Wear suitable working clothes.

Respiratory protection : If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

SECTION 9: Physical and chemical properties

9.1 - Information on basic physical and chemical properties

Physical state : Solid

Appearance : Irregular shaped.

Color : White

Odor : No data available

Odor threshold : No data available

pH : No data available

Relative evaporation rate (butyl acetate=1) : No data available

Melting point : No data available

Freezing point : No data available

Boiling point : No data available

Flash point : No data available

Self ignition temperature : No data available

Decomposition temperature : No data available

Flammability (solid, gas) : No data available

Vapor pressure : No data available

Relative vapor density at 20 °C : No data available

Relative density : 57-59 lb/ft3

Solubility : No data available

Log Pow : No data available

Log Kow : No data available

Viscosity, kinematics : No data available

Viscosity, dynamic : No data available

Explosive properties : No data available

Oxidizing properties : No data available

Explosive limits : No data available

9.1 - Other information

No additional information available

SECTION 10: Stability and Reactivity

10.1 - Reactivity

No additional information available

10.2 - Chemical stability

Stable under normal conditions.

10.3 - Possibility of hazardous reactions

Will not occur

10.4 - Conditions to avoid

None

10.5 - Incompatible materials

Strong oxidizing and reducing agents.

10.6 - Hazardous decomposition products

Organic chlorides, amines, hydrogen chloride may be produced.

SECTION 11: Toxicological information

11.1 - Information on toxicological effects

Acute toxicity : Not classified

Zeolite (1318-02-1)	
LD50 oral rat	5000 mg/kg
LD50 dermal rabbit	> 2000 mg/kg
LC50 inhalation rat (mg/l)	2.4 mg/l (Exposure time: 1 h)
ATE (oral)	5000 mg/kg

Skin corrosion/irritation : Not classified

Serious eye damage/irritation : Causes serious eye damage.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Zeolite (1318-02-1)	
IARC group	3

Reproductive toxicity : Not classified
 Specific target organ toxicity (single exposure) : May cause respiratory irritation.
 Specific target organ toxicity (repeated exposure) : Not classified
 Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1 - Toxicity

Zeolite (1318-02-1)	
LC50 fishes 1	1800 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [semi-static])
EC50 Daphnia 1	1000 - 1800 mg/l (Exposure time: 48 h - Species: Daphnia magna)
EC50 other aquatic organisms 1	18 mg/l (Exposure time: 96 h - Species: Desmodesmus subspicatus)
LC50 fish 2	3200 - 5600 mg/l (Exposure time: 96 h - Species: Oryzias latipes [semi-static])

12.2 - Persistence and degradability

No additional information available

12.3 - Bioaccumulative potential

No additional information available

12.4 - Mobility in soil

No additional information available

12.5 - Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1 - Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

In accordance with DOT / ADR / RID / ADN / IMDG / ICAO / IATA

14.1 - UN number

Not applicable

14.2 - UN proper shipping name

Not applicable

SECTION 15: Regulatory information

15.1 - US Federal regulations

15.2 - US State regulations

No additional information available

SECTION 16: Other information

Full text of H-phrases:

Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Skin Irrit. 2	skin corrosion/irritation Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H315	Causes skin irritation
H318	Causes serious eye damage
H335	May cause respiratory irritation
H400	Very toxic to aquatic life

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water

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Emergency Phone: 847-844-0680
Fax: 847-844-0799

HS-300

HS-300 Safety Data Sheet


Revision date : 2022

Section 1: Product and Company Information

Product Name	Product Type	Manufacturer ID	Emergency Phone Number	Address	Common Use of Product
HS-300	Modified Organoclay	Hydrosil International Ltd.	847-844-0680	125 Prairie Lake Rd. East Dundee, IL 60018	Filtration

Section 2: Hazard(s) Identification

2.1 Classification of the substance or mixture (GHS-US)

Pictogram	Signal Word	Hazard Statement
	Warning	Eye Irritation 2B H320; Acute Oral Tox 4, H302; Respiratory Irritation H335

2.2 Precautionary statements (GHS-US) :

- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking
- P220 Keep/Store away from clothing/combustible materials
- P221 Take any precaution to avoid mixing with combustibles
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray
- P271 Use only outdoors or in a well-ventilated area
- P280 Wear protective gloves/protective clothing/eye protection/face protection
- P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing
- P312 Call a POISON CENTER/doctor if you feel unwell
- P370+P378 In case of fire: Use for extinction
- P403+P233 Store in a well-ventilated place. Keep container tightly closed
- P405 Store locked up
- P501 Dispose of contents/container

2.3 Other Hazards

No additional information available

2.4 Unknown acute toxicity (GHS US)

No data available

Section 3: Composition/Information on Ingredients

Name	Product Identifier	Percent By Weight (%)	GHS-US Classification
Zeolite	(CAS No.) 1318-02-1	79.5-81.5	STOT SE 3, H335
Water	(CAS No.) 7732-18-5	12.5-14.5	Not Classified
Proprietary Active Ingredient		3.0-3.8	Not Classified

Section 4: First-Aid Measures

4.1 Description of first aid measures

Inhalation First Aid	Remove person to fresh air. If not breathing, administer CPR or artificial respiration. Seek immediate medical attention.
Skin Contact First Aid	If skin reddening or irritation develops, seek medical attention.
Eye Contact First Aid	Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists seek medical attention.
Ingestion First Aid	If the material is swallowed, rinse mouth thoroughly. DO NOT induce vomiting unless directed to do so by medical personnel. Seek medical attention if large amounts are ingested.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : May cause respiratory irritation.

Symptoms/injuries after skin contact : Causes skin irritation.

Symptoms/injuries after eye contact : Causes eye irritation.

Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3 Indication of any immediate medical attention and special treatment needed

No additional information available

Section 5: Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

5.2 Special hazards arising from the substance or mixture

Fire hazard : None known.

Explosion hazard : None known.

5.3 Advice for firefighters

Protection during firefighting : Firefighters should wear full protective gear (chemical protective clothing and breathing apparatus).

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

General measures : Avoid contact with the skin and the eyes.

For non-emergency personnel : No additional information available

For emergency responders : No additional information available

6.2 Environmental precautions

None.

6.3 Methods and material for containment and cleaning up

For containment : If possible, stop flow of product.

Methods for cleaning up : Shovel or sweep up and put in a closed container for disposal.

6.4 Reference to other sections

No additional information available

Section 7: Handling and Storage

7.1 Precautions for safe handling

Avoid generation of dust.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions : Protect containers from physical damage. Keep container tightly closed and store in dry, cool, well-ventilated area. Protect material from water and contaminated gases.

7.3 Specific end use(s)

No additional information available

Section 8: Exposure Controls/Personal Protection

8.1 Control parameters

No additional information available

8.2 Exposure controls/Person Protection

Appropriate engineering controls : Local exhaust and general ventilation must be adequate to meet exposure standards.

Hand protection : Use impervious gloves to minimize skin contact.

Eye protection : Safety glasses.

Skin and body protection : Wear suitable working clothes.

Respiratory protection : If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state : Solid

Appearance : Granules

Colour : White

Odour : No data available

Odour threshold : No data available

pH : No data available

Relative evaporation rate (butylacetate=1) : No data available

Melting point : No data available

Freezing point : No data available

Boiling point : No data available

Flash point : No data available

Self ignition temperature : No data available

Decomposition temperature : No data available

Flammability (solid, gas) : No data available

Vapour pressure : No data available

Relative vapour density at 20 °C : No data available

Relative density : 57-59 lb/ft³

Solubility : No data available

Log Pow : No data available

Log Kow : No data available

Viscosity, kinematic : No data available

Viscosity, dynamic : No data available

Explosive properties : No data available

Oxidising properties : No data available

Explosive limits : No data available

Section 10: Stability and Reactivity

10.1 Reactivity

No additional information available.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

None.

10.4 Conditions to avoid

Strong oxidizing and reducing agents.

10.5 Incompatible materials

Strong oxidizers such as ozone, liquid oxygen, chlorine, etc.

10.6 Hazardous decomposition products

Organic chlorides, amines, hydrogen chloride may be produced.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity : Not classified

Zeolite (CAS No. 1318-02-1)	
LD50 Oral Rat	5000 mg/kg
LD50 Dermal Rabbit	>2000 mg/kg
LC50 Inhalation Rat	2.4 mg/l (Exposure Time: 1Hr
ATE (Oral)	5000 mg/kg

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Zeolite (CAS No. 1318-02-1) IARC Group: 3

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : May cause respiratory irritation.

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Section 12: Ecological Information

12.1 Toxicity

Zeolite (CAS No. 1318-02-1)	
LC50 Fishes 1	1800 mg/l (Exposure time: 96 h Species: Brachydanio rerio [semi-static])
EC50 Daphnia 1	1000 1800 mg/l (Exposure time: 48 h Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	18 mg/l (Exposure time: 96 h Species: Desmodesmus subspicatus)
LC50 Fish 2	3200 5600 mg/l (Exposure time: 96 h Species: Oryzias latipes [semi-static])

12.2 Persistence and degradability

No additional information available

12.3 Bioaccumulative potential

No additional information available

12.4 Mobility in soil

No additional information available

12.5 Other adverse effects

No additional information available

Section 13: Disposal Considerations

13.1 Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 14: Transport Information

In accordance with DOT / ADR / RID / ADNR / IMDG / ICAO / IATA

14.1 UN number

Not applicable

14.2 UN proper shipping name

Not applicable

Section 15: Regulatory Information

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory.

15.1 US Federal regulations

OSHA: This product is not known to be hazardous by OSHA Highly Hazardous Process Safety Standard, 29 CFR 1910.119.

CERCLA/SARA Hazardous Substances: Not applicable.

15.2 US State regulations

Review specific state regulations.

Section 16: Other Information

Full text of H-phrases:

Eye Dam. 1	Series eye damage/eye irritation Category 1
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Skin Corr. 1A	Skin corrosion/irritation Category 1A
Skin Irrit. 2	Skin corrosion/irritation Category 2
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation

NFPA health hazard : 1 Exposure could cause irritation but only minor residual injury even if no treatment is given.

NFPA fire hazard : 0 Materials that will not burn

NFPA reactivity : 0 Normally stable, even under fire exposure conditions, and are not

reactive with water

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HS-ACC

Coal Based Activated Carbon Safety Data Sheet


Revision date : 2023

Section 1: Product and Company Information

Product Name: HS-ACC
Product Type: Coal Based Activated Carbon
Manufacturer ID: Hydrosil International Ltd.
Emergency Phone Number: 847-844-0680
Address: 125 Prairie Lake Rd. East Dundee, IL 60118

Section 2: Hazard(s) Identification

2.1 Classification of the substance or mixture (GHS-US)

Pictogram	Signal Word	Hazard Statement
	Warning	Eye Irritation 2B H320; Acute Oral Tox 4, H302; Respiratory Irritation H335

2.2 Precautionary statements (GHS-US) :

P261: Avoid breathing dust/fume/gas/mist/vapours/spray
P264: Wash & thoroughly after handling
P271: Use only outdoors or in a well-ventilated area
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312: Call a POISON CENTER/doctor/& if you feel unwell
P337+P313: If eye irritation persists: Get medical advice/attention
P403+P233: Store in a well-ventilated place. Keep container tightly closed
P405: Store locked up
P501: Dispose of contents/container to &

2.3 Other Hazards

No additional information available

2.4 Unknown acute toxicity (GHS US)

No data available

Section 3: Composition/Information on Ingredients

Name	Product Identifier	Percent By Weight (%)	Impurities
Carbon	(CAS No.) 7440-44-0	100	None

Section 4: First-Aid Measures

4.1 Description of first aid measures

Inhalation First Aid	Remove person to fresh air. If not breathing, administer CPR or artificial respiration. Seek immediate medical attention.
Skin Contact First Aid	If skin reddening or irritation develops, seek medical attention.
Eye Contact First Aid	Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists seek medical attention.
Ingestion First Aid	If the material is swallowed, rinse mouth thoroughly. DO NOT induce vomiting unless directed to do so by medical personnel. Seek medical attention if large amounts are ingested.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : May cause respiratory irritation.

Symptoms/injuries after skin contact : Causes skin irritation.

Symptoms/injuries after eye contact : Causes eye irritation.

Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3 Indication of any immediate medical attention and special treatment needed

No additional information available

Section 5: Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

5.2 Special hazards arising from the substance or mixture

Fire hazard : None known.

Explosion hazard : None known.

5.3 Advice for firefighters

Protection during firefighting : Firefighters should wear full protective gear (chemical protective clothing and breathing apparatus).

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

General measures : Avoid contact with the skin and the eyes.
For non-emergency personnel : No additional information available
For emergency responders : No additional information available

6.2 Environmental precautions

None.

6.3 Methods and material for containment and cleaning up

For containment : If possible, stop flow of product.
Methods for cleaning up : Shovel or sweep up and put in a closed container for disposal.

6.4 Reference to other sections

No additional information available

Section 7: Handling and Storage

7.1 Precautions for safe handling

Avoid generation of dust.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions : Protect containers from physical damage. Keep container tightly closed and store in dry, cool, well-ventilated area. Protect material from contaminated water and gases.

7.3 Specific end use(s)

No additional information available

Section 8: Exposure Controls/Personal Protection

8.1 Control parameters

No additional information available

8.2 Exposure controls/Person Protection

Appropriate engineering controls : Local exhaust and general ventilation must be adequate to meet exposure standards.
Hand protection : Use impervious gloves to minimize skin contact.
Eye protection : Safety glasses.
Skin and body protection : Wear suitable working clothes.
Respiratory protection : If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state : Solid
Appearance : Granules
Color : Black
Odor : No data available
Odor threshold : No data available
pH : No data available
Relative evaporation rate (butylacetate=1) : No data available
Melting point : No data available
Freezing point : No data available
Boiling point : No data available
Flash point : No data available
Self ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapour pressure : No data available
Relative vapour density at 20 °C : No data available
Relative density : 29-31 lb/ft3
Solubility : No data available
Log Pow : No data available
Log Kow : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidising properties : No data available
Explosive limits : No data available

Section 10: Stability and Reactivity

10.1 Reactivity

Contact with strong oxidizers such as ozone, liquid oxygen, chlorine, etc. may result in fire.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

None.

10.4 Conditions to avoid

None.

10.5 Incompatible materials

Strong oxidizers such as ozone, liquid oxygen, chlorine, etc.

10.6 Hazardous decomposition products

Carbon monoxide may be generated in the event of fire.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity : Not classified

Carbon (CAS No. 7440-44-0)

LD50 Oral Rat	> 1000 mg/kg
---------------	--------------

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : May cause respiratory irritation.

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Section 12: Ecological Information

12.1 Toxicity

No additional information available

12.2 Persistence and degradability

No additional information available

12.3 Bioaccumulative potential

No additional information available

12.4 Mobility in soil

No additional information available

12.5 Other adverse effects

No additional information available

Section 13: Disposal Considerations

13.1 Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 14: Transport Information

In accordance with DOT / ADR / RID / ADN / IMDG / ICAO / IATA

14.1 UN number

Not applicable

14.2 UN proper shipping name

Not applicable

Section 15: Regulatory Information

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory.

15.1 US Federal regulations

OSHA: This product is not known to be hazardous by OSHA Highly Hazardous Process Safety Standard, 29 CFR 1910.119.

CERCLA/SARA Hazardous Substances: Not applicable.

15.2 US State regulations

Review specific state regulations.

Section 16: Other Information

Full text of H-phrases:

Eye Irrit. 2B	Serious eye damage/eye irritation Category 2B
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H335	May cause respiratory irritation

NFPA health hazard : 1 Exposure could cause irritation but only minor residual injury even if no treatment is given.

NFPA fire hazard : 0 Materials that will not burn

NFPA reactivity : 0 Normally stable, even under fire exposure conditions, and are not reactive with water

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Appendix D: Job Hazard Analysis

SECTION 1: JOB/TASK/PROCESS (Document General Information Below)

SCOPE OF WORK: WWT system Media and filter changeout.			DURATION OF PROJECT/TASK: TBD
JOB HAZARD ANALYSIS LED BY (Print Name): Steve Cozak	TITLE: Field Service Project Manager	ORIGINAL ANALYSIS DATE: 11/29/22	REVISION DATE: 03/18/24
JOB HAZARD ANALYSIS REVIEWED BY (Print Name):: Greg Bird, CSP	TITLE: Sr. Health and Safety Manager	APPROVED BY: G. Bird	TITLE: Sr. H&S Mgr.

SECTION 2: Chemical/Physical/ Biological Hazards (Describe Job Hazard Agents Identified)

Chemical Agents (HAZCOM/ WHMIS MSDS Review)	Physical Agents	Biological Agents
Landfill Leachate, VOCs (trace), Hydrogen Peroxide, Talon(non-Cl Brake cleaner), Defoaming agent.	Slip, Trips, Falls, Pinch Points, Noise, Pressurized systems.	Heat Stress, Cold Stress

SECTION 3: PPE HAZARD ASSESSMENT SUMMARY

Head	<input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Side Impact Hard Hat <input type="checkbox"/> DOT Approved Helmet <input type="checkbox"/> Lock-On-Life Support Helmet <input type="checkbox"/> Other: _____
Eyes/Face/Neck	<input checked="" type="checkbox"/> Safety Glasses with Side Shields <input checked="" type="checkbox"/> Goggles – Chemical <input type="checkbox"/> Goggles – Dust <input checked="" type="checkbox"/> Face Shield <input type="checkbox"/> Welding Helmet <input type="checkbox"/> Balaclava (F.R.) <input type="checkbox"/> Other: _____
Respiratory	<input type="checkbox"/> Dust Mask <input type="checkbox"/> Half Face Respirator/Cartridge Type: _____ <input type="checkbox"/> Full Face AP Respirator/Cartridge Type: _____ <input type="checkbox"/> PAPR/ Cartridge Type: _____ <input checked="" type="checkbox"/> SABA <input type="checkbox"/> SCBA <input type="checkbox"/> Lock-On-Life Support Helmet <input type="checkbox"/> Other: _____
Ears/Hearing	<input checked="" type="checkbox"/> Ear Plug <input type="checkbox"/> Ear Muff <input type="checkbox"/> Double (Combination Ear Plugs & Ear Muffs) <input type="checkbox"/> Other: _____
Hands/Arms	<input type="checkbox"/> Cotton Gloves <input checked="" type="checkbox"/> Leather Gloves <input type="checkbox"/> Puncture/Cut Resistant <input checked="" type="checkbox"/> PVA <input checked="" type="checkbox"/> Nitrile Liner <input type="checkbox"/> Anti-vibration <input type="checkbox"/> Impact Protection <input type="checkbox"/> Thermal <input type="checkbox"/> Sleeves <input type="checkbox"/> Wristlets/Type: _____ <input type="checkbox"/> Other: _____
Body	<input type="checkbox"/> Fire Retardant Coveralls/Uniform <input type="checkbox"/> Chemical Protective Clothing/Type: _____ <input type="checkbox"/> Tyvek/Type: _____ <input type="checkbox"/> Apron <input type="checkbox"/> Sleeves <input type="checkbox"/> Life Jacket/Vest <input checked="" type="checkbox"/> High Visibility Vest/Shirt <input type="checkbox"/> Heat Reflective Suit <input type="checkbox"/> Foul Weather Gear <input type="checkbox"/> Cool Vest <input type="checkbox"/> Kevlar Cut Resistant Suits <input type="checkbox"/> Other: _____
Feet	<input checked="" type="checkbox"/> Safety Boots – Leather or Rubber <input type="checkbox"/> Metatarsals (Feet & Shin) <input type="checkbox"/> Ice Cleats (Slip-Overs) <input type="checkbox"/> Booties/ Type: _____ <input type="checkbox"/> Other: _____
Covid-19	<input checked="" type="checkbox"/> Cloth Face covering within 6ft of others <input checked="" type="checkbox"/> Refer to CHES Pandemic Management Plan

SECTION 4: HAZARD ANALYSIS PROCESS *(Document Hazard Analysis and Controls Based on each Job Step/ Task Sequence)*

Sequence Of Job Steps/Tasks (Number)	Hazards/Potential Hazards & Effects (What could go wrong?)	Recommended Hazard Control Or Safe Job Procedures (How can harm be prevented?)	Required PPE (List PPE required for each Job Step)
1.Set-up of Hurricane (Vacuum Truck), Roll-Off Container and Containments	<ul style="list-style-type: none">a) Truck placementb) Slips, trips, fallsc) Back strain/injuries	<ul style="list-style-type: none">a) Inspect the staging area and make sure everything is level and secured. Utilize a spotter to guide into the area. inspect area overhead before moving vehicleb) Tour and inspect work area to find slip trip fall hazards. Remove, protect, or mark all slip trip fall hazards. Create safe pedestrian pathways.c) Use proper lifting techniques. Utilize proper body positioning knees bent, back straight and shoulders square. Utilize mechanical means, forklifts, to move equipment. DO not lift anything over 50 pounds without assistance.	Level-D Hard Hat Safety Glasses Steel toe boots Leather Gloves with nitrile liners Safety Vest Hearing protection as needed
2. Removal of Spent Media	<ul style="list-style-type: none">a) Slips, trips, and fallsb) Back strain/injuriesc) Utilize Vacuum hopper unitd) Utilize forklift or other mechanical means to move drums/equipment	<ul style="list-style-type: none">a) Tour and inspect work area to find slip trip fall hazards. Remove, protect, or mark all slip trip fall hazards. Create safe pedestrian pathways.b) Use proper lifting techniques. Utilize proper body positioning knees bent, back straight and shoulders square. Utilize mechanical means, forklifts, to move equipment. DO not lift anything over 50 pounds without assistance.c) Discharge vapors downwind away from personnel.d) Only authorized personnel will be allowed to operate Forklift/mechanical equipment. Use seat belt at all times. Do not lift loads in uneven ground/surfaces. BE aware of your surroundings	Level-D Hard Hat Safety Glasses Steel toe boots Leather Gloves with nitrile liners Safety Vest Hearing protection as needed

<p>3. Moving and loading the hurricane/hopper and dumping media into a roll-off for disposal</p>	<p>a) Slips, trips, and falls</p> <p>b) Struck by equipment</p> <p>c) Back strain/injuries</p> <p>d) Pinch Points</p>	<p>a) Tour and inspect work area to find slip trip fall hazards. Remove, protect, or mark all slip trip fall hazards. Create safe pedestrian pathways.</p> <p>b) Stay clear of equipment during load out. Never approach equipment unless the operator is aware of your approach. Do not get under suspended loads.</p> <p>c) Use proper lifting techniques. Utilize proper body positioning knees bent, back straight and shoulders square. Utilize mechanical means, forklifts, to move equipment. DO not lift anything over 50 pounds without assistance.</p> <p>d) Always be aware of your surroundings and where you are placing your hands and fingers. Never place your hands in areas you cannot see.</p>	<p>Level D: Hard Hat Steel toe boots Safety Glasses PVA Gloves Nitrile Inner gloves Safety Vest Hearing protection, as needed</p>
<p>4. Reload Vessel with new media</p>	<p>a) Slips, Trips, and Falls</p> <p>b) Working from a ladder</p> <p>c) Back strain/injuries</p> <p>d) Hand Lacerations</p> <p>e) Pinch Points</p>	<p>a) Tour and inspect work area to find slip trip fall hazards. Remove, protect, or mark all slip trip fall hazards. Create safe pedestrian pathways.</p> <p>b) Set ladder base on a stable flat surface. Always keep three points in contact while on the ladder. Tie ladder with rope to the dome on top of the vessel. Do not allow your belt buckle to go beyond the ladder</p> <p>c) Use proper lifting techniques. Utilize proper body positioning knees bent, back straight and shoulders square. Utilize mechanical means, forklifts, to move equipment. DO not lift anything over 50 pounds without assistance.</p> <p>d) Use only scissors or shears to cut with. Open blade cutters, including safety cutters are not permitted.</p> <p>e) Always be aware of your surroundings and where you are placing your hands and fingers. Never place your hands in areas you cannot see.</p>	<p>Level D: Hard Hat Steel toe boots Safety Glasses PVA Gloves Nitrile Inner gloves Safety Vest Hearing protection, as needed</p>

SECTION 5: Atmospheric Monitoring Required: ☐ Yes ☐ No*[For assistance determining exposure action levels please refer to Clean Harbors' Respiratory Protection Standard - Appendix 9]*

List Substance(s) or Material(s) of Concern Below:	Monitoring Instrument	Substance / Material Exposure Action Levels			
		Level A	Level B	Level C	Level D
Air Monitoring is not planned for this task.					

SECTION 6: Training (Document the required Job Task Training)

See Section 4.0 of HASP

SECTION 7: Emergency Procedures (Document the Emergency Response Procedures – i.e. First Aid, Emergency Call #'s, etc.)

See Appendix B of the HASP

SECTION 8: Decontamination Procedures (Document the Decontamination Procedures –i.e. People and Equipment)

Hazmat decontamination is not anticipated. System components will be flushed prior to demobilization.

SECTION 9: Additional Job Specific Considerations: ☐ Yes ☐ No**SECTION 10: Job Hazard Analysis Verification (Crew Supervisor Review and Sign Off)**

The Job Hazard Analysis Team has assessed the worksite conditions and confirms:

- The JHA addresses the significant Task Steps and applicable hazards and necessary controls.
- The Team has the appropriate resources (people and equipment) to do the job safely.
- Others that could be affected by the work have been informed.
- Energy isolation (if applicable) has been VERIFIED AND DEMONSTRATED.
- This document facilitates compliance of the PPE assessment and hazard analysis pursuant to company, legislative and client requirements.

CREW SUPERVISOR (Please Print):	POSITION:	SIGNATURE:	DATE:

SECTION 11: CREW REVIEW AND SIGN-OFF

NAME (Print)	Signature	NAME (Print)	Signature	NAME (Print)	Signature

	<h1 style="text-align: center;">JOB HAZARD ANALYSIS</h1>	Document Control ID: HS.00023.FM-10HS	
		Revision Date: 05/29/2018	Revision #: 8
		Owner: Health & Safety	

SECTION 1: JOB/TASK/PROCESS (Document General Information Below)

SCOPE OF WORK			DURATION OF PROJECT/TASK:
Set-Up and Operation of Temporary Water Treatment System			
Original JOB HAZARD ANALYSIS LED BY (Print Name): Steve Cozak	TITLE: Project Manager	ORIGINAL ANALYSIS DATE: 02/24/22	REVISION DATE: 03/18/24
JOB HAZARD ANALYSIS REVIEWED BY (Print Name):: Greg Bird	TITLE: Sr. H&S Manager	APPROVED BY: Greg Bird	TITLE: Sr. H&S Manager

SECTION 2: Chemical/Physical/ Biological Hazards (Describe Job Hazard Agents Identified)

Chemical Agents (HAZCOM/ WHMIS MSDS Review)	Physical Agents	Biological Agents
Landfill Leachate, VOCs (trace), Hydrogen Peroxide, Talon(non-Cl Brake cleaner), Defoaming agent.	Slip, Trips, Falls, Pinch Points, Noise, Pressurized systems.	Heat Stress, Cold Stress

SECTION 3: PPE HAZARD ASSESSMENT SUMMARY

Head	<input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Side Impact Hard Hat <input type="checkbox"/> DOT Approved Helmet <input type="checkbox"/> Lock-On-Life Support Helmet <input type="checkbox"/> Other: _____
Eyes/Face/Neck	<input checked="" type="checkbox"/> Safety Glasses with Side Shields <input checked="" type="checkbox"/> Goggles – Chemical <input type="checkbox"/> Goggles – Dust <input checked="" type="checkbox"/> Face Shield <input type="checkbox"/> Welding Helmet <input type="checkbox"/> Balaclava (F.R.) <input type="checkbox"/> Other: _____
Respiratory	<input type="checkbox"/> Dust Mask <input type="checkbox"/> Half Face Respirator/Cartridge Type: _____ <input type="checkbox"/> Full Face AP Respirator/Cartridge Type: _____ <input type="checkbox"/> PAPR/ Cartridge Type: _____ <input type="checkbox"/> SABA <input type="checkbox"/> SCBA <input type="checkbox"/> Lock-On-Life Support Helmet <input type="checkbox"/> Other: _____
Ears/Hearing	<input checked="" type="checkbox"/> Ear Plug <input type="checkbox"/> Ear Muff <input type="checkbox"/> Double (Combination Ear Plugs & Ear Muffs) <input type="checkbox"/> Other: _____
Hands/Arms	<input type="checkbox"/> Cotton Gloves <input checked="" type="checkbox"/> Leather Gloves <input type="checkbox"/> Puncture/Cut Resistant <input type="checkbox"/> PVC <input checked="" type="checkbox"/> Nitrile <input type="checkbox"/> Anti-vibration <input type="checkbox"/> Impact Protection <input type="checkbox"/> Thermal <input type="checkbox"/> Sleeves <input type="checkbox"/> Wristlets/Type: _____ <input type="checkbox"/> Other: _____
Body	<input type="checkbox"/> Fire Retardant Coveralls/Uniform <input type="checkbox"/> Chemical Protective Clothing/Type: _____ <input type="checkbox"/> Tyvek/Type: _____ <input type="checkbox"/> Apron <input checked="" type="checkbox"/> Sleeves <input type="checkbox"/> Life Jacket/Vest <input checked="" type="checkbox"/> High Visibility Vest/Shirt <input type="checkbox"/> Heat Reflective Suit <input type="checkbox"/> Foul Weather Gear <input type="checkbox"/> Cool Vest <input type="checkbox"/> Kevlar Cut Resistant Suits <input type="checkbox"/> Other: _____
Feet	<input type="checkbox"/> Safety Boots – Leather or Rubber <input type="checkbox"/> Metatarsals (Feet & Shin) <input type="checkbox"/> Ice Cleats (Slip-Overs) <input type="checkbox"/> Booties/ Type: _____ <input checked="" type="checkbox"/> Other: leather Safety Shoes w/safety toe
Covid-19	<input checked="" type="checkbox"/> Cloth Face covering within 6ft of others <input checked="" type="checkbox"/> Refer to CHES Pandemic Management Plan



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SECTION 4: HAZARD ANALYSIS PROCESS *(Document Hazard Analysis and Controls Based on each Job Step/ Task Sequence)*

Sequence Of Job Steps and Tasks	Hazards/Potential Hazards & Effects (What could go wrong?)	Recommended Hazard Control Or Safe Job Procedures (How can harm be prevented?)	Required PPE (List PPE required for each Job Step)
For all tasks	a. Slip, Trip, Fall hazards b. Lifting, strains,	a. Tour and inspect work area to find all STF hazards; remove, protect, or mark all STF hazards; Create safe pedestrian paths; locate hoses, materials, equipment in vehicles away from pedestrian pathways. b. Use available mechanical equipment with appropriate attachments; use safe lifting techniques, such as keeping lower back straight, lifting with leg muscles, "build-a-bridge" by placing one hand on a stable object; get help with anything that weighs more than 50 pounds.	Hard hat Safety Glasses Impervious Gloves under leather gloves Safety Shoes High visibility vest Hearing protection
Set up of Equipment	a. Crushed by/Struck by equipment during movement. b. Pinch points, c. Working from height d. Cuts, bruises, broken bones when un-coiling hoses e. Struck by compressor or generator.	a. Ensure spotter is used when backing equipment in place. Personnel to keep clear a minimum of 5ft from equipment/vehicles during positioning b. Review and locate equipment labels for any pinch point warnings. Check for other pinch points such as camlock connectors. Keep hands and feet clear of heavy items being placed c. System trailers are less than 4ft high. However, inspect and set up railing systems on portable storage units. Use small work platforms to access equipment, avoid step stools and ladders if possible. d. Never release a coiled hose without assistance. Never uncoil a hose vertically, always set hose horizontally on the ground when releasing tie straps. e. Assure compressors or Generator wheels are chocked. Un-hitch trailer from tow vehicle in case of emergency evacuation from the area	Hard hat Safety Glasses Impervious Gloves under leather gloves Safety Shoes High visibility vest Hearing protection



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Start System Pumps	<ul style="list-style-type: none"> a. Pressure hazards b. Skin contact with impacted water from leaks in the system. c. Struck by system components if not secured. Hoses can jump suddenly and cause direct injury or injury from a fall, especially on corners and bends. d. Exposure to substances of concern. e. High noise levels from generator or compressor engines f. Electric shock from Generators 	<ul style="list-style-type: none"> a. Release all stored pressure before working with hoses. Secure camlock fittings on hoses with camlock clamps or heavy-duty wire ties. Ensure that any chemical injection lines are secure. b. Before starting the system, perform system leak checks as required in the WWTS SOP. c. Secure all hoses using ratchet straps or some other robust method. Do not secure with ropes. When laying hose, minimize curves and corners. d. Wear PPE prescribed in Section 3. e. Wear hearing protection prescribed in Section 3. f. Inspect wiring for excess wear or damage. Ensure the GFCI is operational or use an in-line GFCI. 	<ul style="list-style-type: none"> Hard hat Safety Glasses Impervious Gloves under leather gloves Safety Shoes High visibility vest Hearing protection
Monitor system: <ul style="list-style-type: none"> - Flow meter readings - Process sampling 	<ul style="list-style-type: none"> a. Water pressure b. Splashes and skin contact with impacted water 	<ul style="list-style-type: none"> a. Ensure all pumping lines are connected and secured. Secure camlock fittings on hoses. Ensure that injection lines are secure. b. Wear PPE prescribed in Section 3, including face shield or goggles. 	<ul style="list-style-type: none"> Hard hat Safety Glasses Impervious Gloves under leather gloves Safety Shoes High visibility vest Hearing protection
Water Storage: <ul style="list-style-type: none"> -Frac Tanks -Weir tanks -Water Separators 	<ul style="list-style-type: none"> a. Falls from height. b. Skin contact with impacted water c. Leaks and spills from vessels, hoses, connections. 	<ul style="list-style-type: none"> a. Ensure vessel have railings. If no railings, Contact H&S for a personal fall protection plan b. Wear PPE as described in Section 3. Close files and bleed hoses into secondary containment before disconnecting lines. c. Perform periodic checks on system for leaks. Ensure frank tanks, weird tanks, separators R set within the secondary containment. Ensure basic spill response equipment is available. 	



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Decon and clean up materials.	a. Exposure b. Strains	a. Use PPE when wiping down equipment, b. Use Safe lifting techniques such as: - Keeping back straight - Lift with legs, not the back - Get assistance from others - Use available mechanical assist	Hard hat Safety Glasses Impervious Gloves under leather gloves Safety Shoes High visibility vest Hearing protection
Pump operation	a. Fire and spills during refueling. b. Pressure and Splash exposure to contaminants of concern.	a. Assure fuel container and pump fuel tank static has been dissipated by touching the pump, then the fuel container with bare hands. Assure a 20lb fire Extinguisher is in the immediate vicinity. Never lock and/or leave the fill spigot unattended. Remove locking pin from dispenser. Place secondary containment at the fueling station to capture incidental spills. Check fuel tank caps to assure they are tight. b. Shut down pump and bleed effluent line before disconnecting hose, troubleshooting or any other maintenance task	Hard hat Safety Glasses Impervious Gloves under leather gloves Safety Shoes High visibility vest Hearing protection
Operation of Treated Water Injection pump	a. Uncontrolled release of pressure. b. High Noise	a. Assure the injection hydrant valve is open before starting pump. During recirculation, monitor pressure gage for max pressure not to exceed 150psi. When shutting down, shut down pump first, then close injection hydrant valve. Drain/Bleed lines before disconnecting hoses. b. Wear prescribed hearing protection.	Hard hat Safety Glasses Impervious Gloves under leather gloves Safety Shoes High visibility vest Hearing protection
Waste Characterization and Handling	a. Skin exposure from samples and sample preservatives.	a. Wear prescribed PPE in Section 3 when handling samples and preservatives.	Hard hat Safety Glasses Impervious Gloves under leather gloves Safety Shoes High visibility vest Hearing protection



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Add other identified site hazards here

SECTION 5: Atmospheric Monitoring Required: ☐ Yes ☐ No

[For assistance determining exposure action levels please refer to Clean Harbors' Respiratory Protection Standard - Appendix 9]

List Substance(s) or Material(s) of Concern Below:	Monitoring Instrument	Substance / Material Exposure Action Levels			
		Level A	Level B	Level C	Level D

SECTION 6: Training (Document the required Job Task Training)



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- Site orientation

SECTION 7: Emergency Procedures (*Document the Emergency Response Procedures - i.e. First Aid, Emergency Call #'s, etc.*)

- Refer to site/facility emergency procedures

SECTION 8: Decontamination Procedures (*Document the Decontamination Procedures -i.e. People and Equipment*)

N/A

SECTION 9: Additional Job Specific Considerations: ☐ Yes ☐ No

SECTION 10: Job Hazard Analysis Verification (Crew Supervisor Review and Sign Off)

The Job Hazard Analysis Team has assessed the worksite conditions and confirms:

- The job and site specific conditions have been reviewed to ensure additional hazards have been addressed as warranted.
- The JHA addresses the significant Task Steps and applicable hazards and necessary controls.
- The Team has the appropriate resources (people and equipment) to do the job safely.
- Others that could be affected by the work have been informed.
- Energy isolation (if applicable) has been VERIFIED AND DEMONSTRATED.
- This document facilitates compliance of the PPE assessment and hazard analysis pursuant to company, legislative and client requirements.

SUPERVISOR / PM/ GM (Please Print):	POSITION:	SIGNATURE:	DATE:

SECTION 11: Job Hazard Analysis Review (Work Team Reviews and Sign-Off)

NAME (Print)	Signature	NAME (Print)	Signature	NAME (Print)	Signature

CTEH Job Hazard Analysis

Leachate Tank Gauging

Risk Values

Low
Moderate
High
Very High

High

Vs.

Moderate

Gain Values

Low
Moderate
High

Accept Task Only with Management

Endorsement

Communicate risk vs gain to management,
implement controls and continually evaluate
conditions and task for change.

Section 01 – Job Site and Communication

Project Number(s)

PROJ-037822

Job Site:

Chiquita Canyon Landfill

Area(s) of Operation:

Tank Farms and Tank Manifolds

Communication:

☐ 2-Way Radios ☒ Cell Phone ☐ Hand Signals ☐ Air Horn ☒ Facility Horn/Siren ☐ Other _____

Section 02 – Personal Protective Equipment (PPE)

Head and Eyes: ☒ Hardhat ☒ Safety Glasses w/ Side Shields ☐ Safety Goggles ☐ Face Shield

Hearing: ☐ Ear Plugs/Caps ☐ Earmuffs ☐ Double Hearing Protection

Clothing and Torso: ☒ High Visibility Clothing ☒ Long Sleeves ☒ Fire Resistant Clothing (FRC)

☐ Personal Flotation Device ☐ Chemical Protective Clothing ☐ Fall Arrest/Restraint Harness

Hands: ☒ Gloves ☐ Gauntlets

Features: ☒ Impact Resistant ☐ Cut Resistant ☐ Temperature Resistant ☐ Chemical Resistant

Feet: ☐ Safety Shoes ☒ Safety Boots

Features: ☒ Safety Toe ☒ Ankle Support ☒ Slip Resistant ☐ Shank ☐ Metatarsal

☐ Temperature Resistant ☐ Chemical Resistant

Respiratory: ☐ Dust Mask/N95 ☒ Air Purifying Respirator ☐ SCBA/SAR ☐ PAPR ☒ Air Monitoring Equip.

Other PPE: Sunscreen

Section 03 – Special Hazard Description

- Leachate vapors can contain high concentrations of Volatile Organic Compounds (VOCs), benzene, hydrogen sulfide (H₂S), Carbon Monoxide (CO) which exceed occupational exposure limits inside tanks and near tank hatches. Low oxygen may exist near tank hatches and inside tanks below 19.5%. Chemical vapors and decreased oxygen content may cause dizziness and unconsciousness. Flammable vapors may be present above the lower explosive limit inside tanks and near hatches.
- Air purifying respirator organic vapor cartridges do not provide protection from carbon monoxide. Ensure selected cartridges provide protection from hydrogen sulfide.
- Tank conditions are unpredictable and change frequently. Previous non-hazardous conditions in a tank does not predict future conditions.



Section 04 – Job Task			
	Job Step	Hazard	Controls
Moderate	Vehicle/roadway	<ul style="list-style-type: none"> • Uneven, muddy, unpaved, and loose roadbeds resulting in reduced stopping distance and vehicle stability. • Heavy commercial truck and equipment traffic. 	<ul style="list-style-type: none"> • Always wear seatbelts. • Do not exceed landfill speed limit of 10 mph. • Yield to heavy vehicle traffic.
Low	Accessing tank farms and manifolds	<ul style="list-style-type: none"> • Tanks may be surrounded by soil berms and uneven terrain with loose soil/rock. Soil can form slick mud following rain. • Tanks are connected by hosing laid on the ground. 	<ul style="list-style-type: none"> • Wear high visibility clothing in areas with vehicle traffic. • Wear fire resistant clothing (FRC). • Do not step on hosing and do not jump over hosing. • Maintain sure footing when walking on uneven and loose terrain. • Wear footwear with lugged outsole, defined heel and ankle support.
Moderate	Accessing tank hatches	<ul style="list-style-type: none"> • Stairs. • Elevated work surfaces. • Open hatches may release chemical vapors and/or flammable vapors. 	<ul style="list-style-type: none"> • Use stair railings when ascending. • Do not stand or crawl on top of tanks. Never jump from one tank to another. • Approach open hatches from upwind and conduct air monitoring in breathing zone while approaching. Don respiratory protection, if necessary, before climbing stairs.
High	Opening tank hatches	<ul style="list-style-type: none"> • Open hatches may release chemical vapors and/or flammable vapors. Oxygen levels may be decreased below 19.5% in hatch vicinity. Chemical vapors and decreased oxygen content may cause dizziness and unconsciousness. 	<ul style="list-style-type: none"> • Don respiratory protection before opening hatch. • Observe Magnehelic pressure gauge prior to opening. Do not open tanks under positive pressure. • Monitor air between hatch and breathing zone while opening hatch. • Stand upwind of hatch when opening. Never stand above hatch when opening. • Leave area and allow tank to ventilate if chemical site-specific action levels in site HASP are exceeded. • Do not use non-intrinsically safe equipment in hatch vicinities.
High	Gauging tank	<ul style="list-style-type: none"> • Persisting chemical hazards. • Confined space 	<ul style="list-style-type: none"> • Conduct continuous air monitoring in breathing zone. • Do not gauge tank if chemical site-specific action levels in site HASP are exceeded. • Do not place any part of body inside tank.
Low	Closing hatch/complete gauging tank	<ul style="list-style-type: none"> • Hand injury from hatch. Tank hatches are heavy and may pinch or crush hands. • Stairs 	<ul style="list-style-type: none"> • Wear impact resistant gloves and ensure hands are clear of hatch when closing. • Use stair railing when descending. Be aware of trip hazards such as hoses when transitioning from stairs to ground.

Section 05 - Additional Notes
Not all tanks may be equipped with Magnehelic pressure gauges. The amount of negative pressure, if any, cannot be identified for these tanks. Use additional caution as tanks with neutral and positive pressure may result in increased exposure to leachate vapors.

Job Hazard Assessment

Date:	Location:	Project Manager:
2/27/2024	Chiquita Canyon	Jamie Beck

Description:

Contract employee inspects FRAC tanks on behalf of Waste Connections

Job Step:	Hazard:	Controls:	Person Responsible:
Visual inspection of FRAC tanks:	Slips, Trips, Falls	Eyes on path	CTEH Team
Grade	Contact with heavy equipment	Do not walk while inspecting FRACs	
Ascending/Descending stairs		Do not walk while inputting data	
Data entry		Work inside handrail	
		3-points contact	
		Get eye contact with equipment operator	
		Step away from high traffic areas to input data	
		Constantly check surroundings	
		Stop in a safe location to input data	
		PPE*	

*Standard PPE: Hardhat, safety glasses with sideshields, FRC, steel toed shoes, gloves (as needed), reflective vest.

Sign if all of your questions have been answered and you are ready to proceed.

[illegible]

Job Hazard Assessment

Date:	Location:	Project Manager:
2/26/2024	Chiquita Canyon	Jason Callahan

Description:

CTEH employees conducting air sampling and monitoring on behalf of the client.

Job Step:	Hazard:	Controls:	Person Responsible:
Calibrate equipment	Calibrate using gas bottles	Use in a well-ventilated area	CTEH Team
Drive to/from work locations	Heavy equipment	Watch traffic, reflective vest, buddy system	
Ascend/Descend FRAC tanks	Slips, trips, falls	3-points of contact, eyes on path	
		Sample upwind, ensure lid does not fall, chemical gloves. If concentration above established limits wear Full-face respirator with organic vapor cartridges. Wear 5-gas meter or equivalent.	
Monitor head space of FRAC tanks	Chemical exposure, pinch points		
		Wear PPE*	
* Standard PPE: Hardhat, safety glasses with sideshields, FRC, reflective vest, steel-toed shoes, gloves (leather/chemical as needed).			

Sign if all of your questions have been answered and you are ready to proceed.

[illegible]

Job Hazard Assessment

Date:		Location:		Project Manager:	
3/5/2024		ETLF Area		Jason Callahan	
Description:					
CTEH Employee collecting samples from hot wells					
Job Step:		Hazard:		Controls:	
Person Responsible:					
1	Add air to the well system	pressurized lines, pinch points	Utilize proper PPE (e.g safety glasses and gloves)	CTEH	
2	Don appropriate PPE	pressurized lines, unknown atmosphere (leachate)	Utilize proper PPE (e.g. heat/liquid resistant gloves, safety shield, APR, 5-gas monitor		
3	Open valves	Unexpected release, burns	Utilize proper PPE (e.g. heat/liquid resistant gloves, safety shield, APR, 5-gas monitor, FR Clothing		
4	Transfer leachate into bowl for sampling	Spray hazard due to to much pressure in the lines	secure hoze and use proper PPE (e.g. heat/liquid resistant gloves, safety shield,		
5	Transfer leachate from the bowl into sample bottle jar for pouring	Splash hazard, unknown atmosphere	Use proper PPE (e.g. heat/liquid resistant gloves, safety shield, APR		
6	Transfer leachate from bottle jar to lab sample (VOA)	Splash hazard, unknown atmosphere	Use proper PPE (e.g. heat/liquid resistant gloves, safety shield, APR		
7	Doff PPE	Contaminated PPE	Dispose/Decon properly		
8					
9					
10					
Example:		Example:		Example:	
Ex Open gate to location		Insects, Heavy Object, Pinch Point		Visually inspect work area, Use proper lifting techniques, wear gloves, watch hand placement	
				James Smith	

[illegible]

Job Hazard Assessment

[illegible]

Job Hazard Assessment

[illegible]

Job Hazard Assessment

Date:	Location:	Project Manager:
3/7/2024	ETLF Area	Jason Callahan

Description:

Well maintenance - leak and pressure testing wells
--

Job Step:	Hazard:	Controls:	Person Responsible:

1	Access well location	Slips, trips, falls, pressurized lines (air and hot temperature liquid)	PPE - Boots, safety glasses, face shield, hard hat/ work procedures.	SCS
2	Connect gauge to force main to determine line pressure	pressurized lines (air and hot temperature liquid)	PPE - Boots, safety glasses, face shield, hard hat/ work procedures.	
3	Leaving well location	Slips, trips, falls	PPE - Boots, safety glasses, face shield, hard hat/ work procedures.	
4				
5				
6				
7				
8				
9				
10				

if pressurized line or leaking air,
remove pump

Example: Example: Example: Example:

Open gate to location	Insects, Heavy Object, Pinch Point	Visually inspect work area, Use proper lifting techniques, wear gloves, watch hand placement	James Smith
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Sign if all of your questions have been answered and you are ready to proceed.

[illegible]

Job Hazard Assessment

Date:	Location:	Project Manager:	
3/7/2024	ETLF Area	Jason Callahan	
Description:			
Well maintenance - pump removal and cleaning			
Job Step:	Hazard:	Controls:	Person Responsible:
1 Access well location	Slips, trips, falls, pressurized lines (air and hot temperature liquid)	PPE - Boots, safety glasses, face shield, hard hat/ work procedures.	SCS
2 Extract pump	Pressurized lines (air and hot temperature liquid), hand tools, pinch points	PPE - Boots, safety glasses, face shield, hard hat / work procedures.	
3 Take pump apart	Hand tools ,pinch points	PPE - Boots, safety glasses, face shield, hard hat	
4 Soak parts in cleaning solution	exposure to cleaning solution	PPE - nitrile gloves	
5 Pressure wash and scrape excess debris from pump	Exposure to excess debris on pump	PPE - Boots, safety glasses, face shield, hard hat/ work procedures.	
6 Reconstruct pump	Hand tools ,pinch points	PPE - Boots, safety glasses, face shield, hard hat	
7 Test pump	Pressurized air lines	PPE - Boots, safety glasses, face shield, hard hat/ work procedures.	
8 Reinstall pump	Pressurized lines (air and hot temperature liquid), hand tools, pinch points	PPE - Boots, safety glasses, face shield, hard hat / work procedures, valve cap to prevent liquid from coming out	
9 repressurize lines	temperature liquid)	shield, hard hat / work procedures	
0			
Example:	Example:	Example:	Example:
Open gate to location	Insects, Heavy Object, Pinch Point	Visually inspect work area, Use proper lifting techniques, wear gloves, watch hand placement	James Smith

[illegible]

Job Hazard Assessment

Date:	Location:	Project Manager:
3/7/2024	Tank Farm Areas	Jason Callahan

Description:

Frac Tank Dosing Operations

Job Step:	Hazard:	Controls:	Person Responsible:
1 Check tote levels	Slips, trips, falls	Slip-resistant	Streamline
2 Remove tote seal with knife	Cuts	PPE - Gloves	
3 Top off totes with another tote if > 1/3 full, replace tote (forklift)	Struck bys, chemical exposure (from fill hose)	Spotter, PPE - gloves, safety glasses	
4			
5 Move injection lines to appropriate tank	Slips, trips, falls, chemical exposure	PPE - Slip-resistant boots, gloves, safety glasses	
6 Attached and activate pump for dosing	Pressurized lines (chemical exposure)	PPE - gloves, safety glasses, face shields	
7 Close mainline after dosing	Pressurized lines (chemical exposure)	PPE - gloves, safety glasses, face shields	
8 Flush excess line with water and pump	Pressurized lines (chemical exposure)	PPE - gloves, safety glasses, face shields	
9 Turn off pump and remove lines	Chemical exposure	PPE - gloves, safety glasses, face shields	
0			

For over night dosing operations

For selected tank dosing

Sign if all of your questions have been answered and you are ready to proceed.

[illegible]

Job Hazard Assessment (JHA)

[illegible]

Job Hazard Assessment (JHA)

[illegible]

Job Hazard Assessment (JHA)

Date:	Location:	JHA Certified By:
3/2/2024	Chiquita Canyon Landfill	Jason Callahan

Description:

Chiquita Canyon Operations Specialist

[illegible]

Sign if all of your questions have been answered and you are ready to proceed.

[illegible]

Job Hazard Assessment (JHA)

Date:	Location:	JHA Certified By:	
3/3/2024	Tank Farms	Jason Callahan	
Description:			
Chiquita Canyon employee(s) perform tank gauging operations of Frac Tanks at the tank farms			
Job Step:	Hazard:	Controls:	Person Responsible:
1 Climbing onto tanks (attached ladder)	Slips, trips, falls, slippery surfaces	Railing on ladder steps, utilizing slip-resistance shoes	Geradro, Chan, Armando, Phil
2 Opening tank lid to determine tank level (no site glass)	Potentially hazardous atmospheres when opening tank lid, pressurized lid popping open	Utilizing 5 gas monitors to check atmospheric levels and utilize APR per the HASP, appropriate PPE and gloves, and proper opening operations to stay out of line of fire.	
3 Opening tank lid to determine tank level (site glass)	Slips, trips, falls, slippery surfaces at ground level	Utilizing slip-resistance shoes, stay vigilant to walking-working surfaces	
4			
5			
6			
7			
8			
9			
10			

Sign if all of your questions have been answered and you are ready to proceed.

[illegible]

Job Hazard Assessment (JHA)

[illegible]

Job Hazard Assessment

Date:	Location:	Project Manager:
-------	-----------	------------------

3/5/2024	ETLF Area	Jason Callahan
----------	-----------	----------------

Description:

Performing maintenance including repairing Frac Tank valves and fittings

Job Step:	Hazard:	Controls:	Person Responsible:

1	Determine tank for repair	Slips, Trips, Falls, Working Surfaces	House keeping of working surfaces	Waste Connections Employee
---	---------------------------	---------------------------------------	-----------------------------------	----------------------------

		Staying clear of pressurized lines
--	--	------------------------------------

		Staying clear of pressurized lines (liquid and air). Utilizing air lines to
--	--	--

		(liquid and air), utilizing air-lines to clear hoses of product. Utilizing
--	--	--

Pressurized Lines, Liquid Exposure:	clear hoses or product, utilizing proper PPE (e.g. gloves, safety
-------------------------------------	---

Pressurized Lines, Liquid Exposure, Generator Fumes, unknown	proper PPE (e.g. gloves, safety glasses), 5 gas monitors to measure
--	---

2 Empty Tank	atmosphere around work area	the unknown atmosphere,
--------------	-----------------------------	-------------------------

		Confirm tank and lines are clear of	
--	--	-------------------------------------	--

	product and unpressurized, utilize
--	------------------------------------

	Pressurized tank and lines, hand tools	proper PPE when using hand tools
--	--	----------------------------------

3	Removing Valve	injury, pinch points	(e.g. gloves)	
---	----------------	----------------------	---------------	--

		utilize proper PPE when using hand
--	--	------------------------------------

4	Install new valve	Hand tools injury, pinch points	tools (e.g. gloves)	
5				

5			
		utilize proper PPE when using hand	

6. Changing Fitting	Hand tools injury, pinch points	utilize proper PPE when using hand tools (e.g. gloves)
---------------------	---------------------------------	--

6	Changing Pitting	Hand tools injury, pinch points	tools (e.g. gloves)
7			

7			
8			

9			
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10			
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Example: Example: Example: Example:

Open gate to location	Insects, Heavy Object, Pinch Point	Visually inspect work area, Use	James Smith
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proper lifting techniques, wear

gloves, watch hand placement

Sign if all of your questions have been answered and you are ready to proceed.

Name	Signature	Name	Signature
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Jarrold Robinson			
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Tank does not have to be empty to change hose fitting

Job Hazard Assessment

Date:	Location:	Project Manager:
3/5/2024	ETLF Area	Jason Callahan

Description:

Performing spill cleanup and Impacted storm water areas

Job Step:	Hazard:	Controls:	Person Responsible:
1 Stop source of spill	chemical exposure, hand tool injury	utilize proper PPE (e.g. gloves and safety glasses) and 5-gas monitor to measure atmosphere	Waste Connections Employee
2 Clean up product	chemical exposure, vac truck fumes	Utilize proper PPE (e.g. gloves and safety glasses) and a 5-gas monitor to measure atmosphere, ground and bond vac truck during product cleanup	
3 Utilize Floor Dry to soak up excess spilled product	potential irritation to Floor-Dry (maybe)	Utilize proper PPE (e.g. gloves) when dispersing Floor Dry	
4			
5 Clean up product	chemical exposure, vac truck fumes	Utilize proper PPE (e.g. gloves and safety glasses) and a 5-gas monitor to measure atmosphere, ground and bond vac truck during product cleanup	
6 Offloading impacted storm water product into Frac Tank	Pressurized Lines, Liquid Exposure, Generator Fumes, unknown atmosphere around the work area, hand tool injury when connecting lines	Staying clear of pressurized lines (liquid and air), 5 gas monitors to measure the unknown atmosphere, Utilizing air-lines to clear hoses of product, Utilizing proper PPE (e.g. gloves, safety glasses),	
7 Unconnecting lines	chemical exposure, hand tool injury	Utilizing air-lines or Vac Truck to clear hoses of product, Utilizing proper PPE (e.g. gloves)	
8			
9			
10			

When cleaning up impacted storm water areas

Sign if all of your questions have been answered and you are ready to proceed.

[illegible]

Job Hazard Assessment

Date:	Location:	Project Manager:
3/5/2024	ETLF Area	Jason Callahan

Description:

Buiding Pipelines

Job Step:	Hazard:	Controls:	Person Responsible:
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1	Getting into equipment	Struck bys; Slips trips, falls	Safe working surface evaluation, Spotter depending on job and work area	Waste Connections Employee
2	Utilizing equipment to move pipeline sections to designated location	Struck bys/Traffic,	Safe driving operations, spotter if needed	
3	Setting pipeline	Slips trips, falls, working surfaces	Safe working surface evaluation, Spotter depending on job and work area	
4	Cutting pipeline to match fitting ends	hand tool injury	Utilizing proper PPE (e.g. gloves and safety glasses),	
5	Performing HDPE Fusion Welding	hand tool injury, burns	Utilizing proper PPE (e.g. gloves and safety glasses, heat-resistant gloves)	
6	Pinching lines together	hand tool injury, pinch points	Utilizing proper PPE (e.g. gloves)	
7	Connecting pipeline to source	chemical exposure, pressurized lines	5-gas monitor for unknown atmospheres	
8				
9				
10				

Sign if all of your questions have been answered and you are ready to proceed.

Name	Signature	Name	Signature
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[illegible]

Job Hazard Assessment

Date:		Location:		Project Manager:	
3/5/2024		ETLF Area		Jason Callahan	
Description:					
Moving Frac Tank from one location to another					
Job Step:		Hazard:		Controls:	
Person Responsible:					
1	Connecting Lines to Frac Tank	Liquid Exposure, Generator Fumes, unknown atmosphere around work area	Staying clear of pressurized lines (liquid and air), Utilizing proper PPE (e.g. gloves, safety glasses), 5 gas monitors to measure the unknown atmosphere,	Waste Connections Employee or Contractor?	
2	Emptying Frac Tank	Pressurized Lines, Liquid Exposure, pinch points, Generator Fumes, unknown atmosphere around work area	5 gas monitor, and proper PPE (e.g. gloves and safety glasses), proper hand tool use		
	Disconnecting Lines to Frac Tank	Liquid Exposure, pressurized lines	Utilizing air-lines to clear hoses, removing pressure off lines		
3	Connecting empty Frac Tank to equipment for moving via shackle	struck bys, pinch points	Utilizing a spotter, closing off work area		
4	Connecting Lines to Frac Tank	Hand tool injury, pinch points	Utilizing proper PPE (e.g. gloves)		
5					
6					
7					
8					
9					
10					

Sign if all of your questions have been answered and you are ready to proceed.

Name	Signature	Name	Signature

Tanks needed to be moved between tank farms will be moved with a truck

Job Hazard Assessment

[illegible]

Job Hazard Assessment


Date:	Location:	Project Manager:	
3/5/2024	ETLF Area	Jason Callahan	
Description:			
Installing electronic tank gauges on Frac Tanks.			
Job Step:	Hazard:	Controls:	Person Responsible:
Getting up onto tank	Slips, trips, falls	Utilize PPE (e.g. Steel toes/Slip Resis.)	Wes Devilbiss
Remove tank cap where gauge will go	Hand tools, pinch points, unknown atmosphere	Utilize PPE (e.g. gloves), 5-gas monitor	
Install piping into tank	Hand tools, pinch points, unknown atmosphere	Utilize PPE (e.g. gloves), 5-gas monitor	
Attaching electronic gauge	Hand tools, pinch points, unknown atmosphere	Utilize PPE (e.g. gloves), 5-gas monitor	
Getting up onto tank	Slips, trips, falls	Utilize PPE (e.g. Steel toes/Slip Resis.)	
Removing Frac Tank lid	Hand tools, pinch points, unknown atmosphere, chemical exposure	Utilize PPE (e.g. chemical glove), 5-gas monitor, wipe down lid before removing	
Using hole popper to install port hole in lid (at trailer/not Frac tank)	Hand tools, pinch points	Utilize PPE (e.g. gloves)	
Replace Frac Tank Lid	Hand tools, pinch points, unknown atmosphere	Utilize PPE (e.g. chemical glove), 5-gas monitor	
Install piping into tank	Hand tools, pinch points, unknown atmosphere	Utilize PPE (e.g. gloves), 5-gas monitor	
Attaching electronic gauge	Hand tools, pinch points, unknown atmosphere	Utilize PPE (e.g. gloves), 5-gas monitor	
Example:	Example:	Example:	Example:
Open gate to location	Insects, Heavy Object, Pinch Point	Visually inspect work area, Use proper lifting techniques, wear gloves, watch hand placement	James Smith

When there is not port hole to use on tank

Sign if all of your questions have been answered and you are ready to proceed.

[illegible]

JOB HAZARD ANALYSIS

Project Name:	Waste Connections – VOC&SVOC Treatment Rapid Response		
Location:	Chiquita Canyon Landfill		
Date Prepared:	03/08/2024 (updated 4/4/24)		
Activity/Work Task:	Site Operations		
Prepared By:	TJS	Signature:	
Reviewed By:	Ricardo Vera	Signature: 	

Calculate Risk Assessment Score (RA)						
		Consequences				
		Neg (1)	Min (2)	Ser(3)	Maj(4)	Cat(5)
Likelihood	Extreme					
	High					
	Significant					
	Low					
	Minor					
	Rare (1)	1 (M)	2 (M)	3 (M)	4 (L)	5 (L)
	Unlikely (2)	2 (M)	4 (L)	6 (L)	8 (S)	10 (S)
	Possible (3)	3 (M)	6 (L)	9 (S)	12 (S)	15 (H)
	Likely (4)	4 (L)	8 (S)	12 (S)	16 (H)	20 (E)
	Almost Certain (5)	5 (L)	10 (S)	15 (H)	20 (E)	25 (E)

Task/Step	Potential Hazards	Impact	Recommended Safe Job Procedures/Controls	Risk Outcome
General – Site Requirements	SIMOPS – Active Landfill, H2S Gas, VOC's, Hot Liquids	Fire/ Explosion	<ul style="list-style-type: none"> Staff working onsite are required to don – Hard Hat, Safety, Glasses, and Safety Boots Require – gloves are task dependent – See HASP Emergency Response Staff are required to use 5 gas meters when working in areas where VOC's are present (example: frac tank area, landfill, etc.,) 	
Unloading Equipment/Set-up	Lull Operation	Pinch/Crush/Equipment Damage	<ul style="list-style-type: none"> Client will provide a lull and qualified operator to move equipment and assist with medial loading. Lull - properly rated, inspected and in good working order ECT2 personnel to stay out of the work zone – do not approach the lull during operation unless acknowledged by the operator and the forks have been placed on the ground If ECT2 personnel are to play a role in the equipment placement, high vis clothing or vest shall be worn. <ul style="list-style-type: none"> Establish communication protocol with operator Avoid line of fire and operator blind spots <p>Verify equipment was inspected prior to use and operator is qualified to operate the equipment.</p>	8S
	Hand and Power Tools	Cuts/Scrapes	<ul style="list-style-type: none"> Keep all tools in good condition with regular maintenance. Use the right tool for the job. Do not use a tool for which it was not designed. Examine each tool for damage before use and do not use damaged tools. 	6L

Task/Step	Potential Hazards	Impact	Recommended Safe Job Procedures/Controls	Risk Outcome
			<ul style="list-style-type: none"> Operate tools according to the manufacturers' instructions. Use the appropriate personal protective equipment. All electrically powered hand tools will be connected through a ground fault circuit interrupter (GFCI). For those tool(s) that are damaged or otherwise defective, the tool will be red-tagged and taken out of service. 	
	Manual Lifting	Sprain/Strain	<ul style="list-style-type: none"> Use mechanical means as first option when available. Under no circumstances should any one person lift more than 49 pounds unassisted. Whenever possible use at least two people to lift the item. Bend the knees; it is the single most important aspect of lifting. Always push, not pull, the object when possible. Size up the load before you lift. Test by lifting one of the corners or pushing. If it's heavy or feels clumsy, get mechanical aid or help from another worker. When in doubt, do not lift alone! Bend the knees; it is the single most important aspect of lifting and limit and twisting of the back. 	6L
Media Loading	Suspended Load (media super sacks)	Crushed By	<p>Inspect the super sack straps are not damaged. Ensure proper position on forks – test lift the super sack to verify proper strap position. Do not stand under or near the suspended load</p> <p>Designated spotter while sack is positioned above the vessel</p> <ul style="list-style-type: none"> High Visibility Vest Use tools provided to open supersack over the Jacky bin. <p>Only qualified / certified operator to operate equipment for rigging</p>	6L
	Suspended load (jacky bin over vessel)	Crushed By	<ul style="list-style-type: none"> Good comms between lull operator and staff member operating jack bin gate. Maintain line of sight. Use 3rd man as spotter 	6L
	Manlift to open manhole for media loading, inhalation of	Unconsciousness, death, splash from impacted material	<ul style="list-style-type: none"> Utilize 5 gas monitor prior to opening & during any work near manway. Equipment requiring maintenance that may expose a worker to hazardous energy or exposure 	6L

Task/Step	Potential Hazards	Impact	Recommended Safe Job Procedures/Controls	Risk Outcome
	gases, fire/explosion, stored energy		<p>to impacted water/leachate requires proper isolation</p> <ul style="list-style-type: none"> - If more than one hazardous energy source requires isolation execute an Energy Isolation Procedure – test for dead prior to executing work - Utilize locks/tags as required - Coordinate work first with Project Manager - PPE: face shield, gauntlet gloves - Wash facilities in the event of contact with skin – use Eyewash unit with wand - When unbolting manway, do NOT remove bolts until manlift has been tested verified for zero pressure. This is performed by lifting manway up utilizing 2 x 4 board or equivalent to ensure stored energy is not in the system. 	
	Manlift to guide Media loading	Falls, crushed, fatality	<ul style="list-style-type: none"> - Always use proper fall prevention while operating or inside of manlift. - Do not stand or use rails as steps - Stay out of line of fire when media super sacks are being guided to vessel - Utilize 5 gas meter to while opening and when performing work near the vessels - Utilize proper PPE when opening supersacks, and never place your body in the line of fire when opening sack underneath manway. - Only qualified MEWP operator to operate manlift - When introducing water into vessels for breaking of media or to put water in system for offgasing. Keep body out of line of fire so that you don't get backsplash. Wear a faceshield and protective clothing when appropriate. 	6L
Operations	Ladder Use	Fall/Injury	<ul style="list-style-type: none"> ● Ladders shall be maintained in good condition at all times. ● Secure ladder when in use by tying off or having a second person provide support. ● Safety feet and other auxiliary equipment shall be kept in good condition to ensure proper performance. ● Ladders shall be inspected prior to use, and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "Dangerous, Do Not Use." ● Rungs should be kept free of grease and oil. ● If a ladder is involved in any of the following, immediate inspection is necessary: <ul style="list-style-type: none"> ○ If ladders tip over, inspect the ladder for side rails dents or bends or excessively dented rungs. Check all rung-to-side-rail connections; check hardware connections and rivets for shear. 	6L

Task/Step	Potential Hazards	Impact	Recommended Safe Job Procedures/Controls	Risk Outcome
			<ul style="list-style-type: none"> ○ If ladders are exposed to oil and grease, equipment should be cleaned of oil, grease or slippery materials. This can easily be done with a solvent or steam cleaning. <p>Ladders having defects are to be marked (as indicated above) and taken out of service until repaired by an authorized party.</p>	
	Slips/Trip – area is muddy (wet soil), also working in area with hoses and parts running throughout site	Injury	<ul style="list-style-type: none"> ● Keep work areas clean and free of clutter. ● Communicate hazards to on-site personnel – remove hazards as appropriate. ● Take your time and pay attention to where you are going ● Adjust your stride to a pace that is suitable for the walking surface and the tasks you are doing. NO RUNNING. ● Check the work area to identify hazards - beware of trip hazards such as uneven surfaces or terrain. ● Establish and utilize a pathway free of slip and trip hazards. ● Choose a safer and dry walking route. Carry loads you can see over. 	6L
	VOCs	Inhalation	<ul style="list-style-type: none"> ● VOC emissions are anticipated to be minimal for ECT2 tasks. ● PID – (5 gas) to monitor general work area and frac tank head space, work zone. See HASP Environmental Monitoring. 	4L
	Sampling	Exposure VOC/SVOC impacted water	<ul style="list-style-type: none"> ● Proper sampling technique to minimize splashing ● PPE – nitrile gloves, face shield or goggles ● Accessible handwashing station – wash hands before eating and prior to leaving the site. 	3M
Maintenance	Hazardous Energy	Shock/water under pressure	<ul style="list-style-type: none"> ● Equipment requiring maintenance that may expose a worker to hazardous energy requires proper isolation ● If more than one hazardous energy source requires isolation execute an Energy Isolation Procedure – test for dead prior to executing work ● Utilize locks/tags as required ● Coordinate work first with Project Manager ● Only QEW to isolate power/electricity if electrical isolation is required. 	6L
Line Breaking	Hazardous Energy	Shock/water under pressure/splash	<ul style="list-style-type: none"> ● Only QEW to isolate power/electricity if electrical isolation is required. ● Equipment requiring maintenance that may expose a worker to hazardous energy or exposure to impacted water/leachate requires proper isolation 	6L

Task/Step	Potential Hazards	Impact	Recommended Safe Job Procedures/Controls	Risk Outcome
			<ul style="list-style-type: none"> • If more than one hazardous energy source requires isolation execute an Energy Isolation Procedure – test for dead prior to executing work • Utilize locks/tags as required • Coordinate work first with Project Manager • PPE: face shield, gauntlet gloves • Wash facilities in the event of contact with skin – use Eyewash unit with wand 	
	Hazardous Gases	Losing consciousness, death, serious injury	<ul style="list-style-type: none"> • Utilize 5 gas monitor at source before, during and after to ensure no gases are present. • Keep body and face away from area being opened • Utilize proper tools • Utilize proper PPE depending on contaminants and work being performed. 	
Media Removal/ Vac Truck	High Noise	Hearing Damage	<ul style="list-style-type: none"> • Vac truck operation produces high noise levels above 85 dBA. • Use hearing protection when in the vicinity of the vac truck. • Limit activity to staff only involved in media removal • Utilize exclusion zone to keep personnel out of work zones 	6L
	Impacted Media/ waste	Improper Disposal	<ul style="list-style-type: none"> • The client is responsible for disposal of spent media. 	6L

Personal Protective Equipment			Equipment	
X Hard Hat	X Safety Glasses	<input type="checkbox"/> Hearing Protection	X Fire Extinguisher – Type: ABC 10 lb	
X Safety Shoes	<input type="checkbox"/> Safety Goggles	<input type="checkbox"/> Double Hearing	<input type="checkbox"/> Barricades	
<input type="checkbox"/> Metatarsal Guards	XFace Shield	X Gloves	X Tape: Caution	
X High Vis Vest	XRespirator	Type: Nitrile	<input type="checkbox"/> Four Gas Meter	
X Nomex/FRC	XHalf or <input type="checkbox"/> Full	Type: Work Glove	X PID – 5 gas monitor	Other:
X Harness/SRL	Cartridge: Acid/VOC	<input type="checkbox"/> Other:	Other: Portable eye wash w/wand	
Applicable Permits				
<input type="checkbox"/> LOTO	<input type="checkbox"/> Confined Space	<input type="checkbox"/> Hot Work	<input type="checkbox"/> Underground Utility	<input type="checkbox"/> Standard Lift Plan
<input type="checkbox"/> Other:				

Signatures		

APPENDIX J
CHIQUITA CANYON LANDFILL ODOR MITIGATION PLAN
(REVISION 1.01)

Landfill Best Management Practices

Mitigating Landfill Reaction Odors

Prepared For:



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Telephone: (406) 370-8544

November 6, 2023

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November 6, 2023

RE: Stipulated Order for Abatement Case No. 6177-4, Condition 12(b)(iv) Report

South Coast AQMD,

In accordance with the Stipulated Order for Abatement issued on September 6, 2023 (Stipulated Order) by the South Coast Air Quality Management District, Neal Bolton, P.E. and Blue Ridge Services Montana, Inc. have prepared this report on LANDFILL BEST MANAGEMENT PRACTICES - *Mitigating Landfill Reaction Odors*.

The Stipulated Order requests the following under Condition 12(b)(iv):

A study and report on landfill best management practices and alternative methods to minimize the release of fugitive surface gas and minimize odors from fugitive surface gas, including cover practices at the Reaction Area (as defined in Condition 9(a)) and working face, and how best to address related odorous emissions, such as through the use of misting systems, fans, odor neutralizer, or other means.

By no later than November 6, 2023, Respondent shall submit a report detailing the findings of this Fugitive Landfill Gas Odor Mitigation Study and the proposals for the minimization of landfill gas release and odors.

This report provides an overview of landfill odors and how they are produced, specifically addressing odors caused by the reaction at Chiquita Canyon Landfill. It provides specific recommendations for operational practices that can mitigate the reaction odors, including landfill gas odors and odors from the associated leachate seeps.

Respectfully,

A handwritten signature in black ink, appearing to read 'Neal Bolton', with a stylized flourish extending to the right.

Neal Bolton, P.E.

President

Blue Ridge Services Montana, Inc.

neal@blueridgeservices.com

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PROJECT UNDERSTANDING AND APPROACH

The Chiquita Canyon Landfill (CCL) is experiencing a significant increase in odor complaints. Most odor complaints appear to be related to the sulfur compounds Hydrogen Sulfide (H₂S) and Dimethyl Sulfide (DMS) that are present in CCL's landfill gas (LFG) as a result of the reaction. Localized leachate seeps may also be producing some odors.

A portion of the CCL is experiencing a reaction also referred to as an Elevated Temperature Landfill event (ETLF). The reaction is occurring in an area defined initially in the Stipulated Order by the boundary of Cells 1/2A, 2B/3, 4 and Module 2B/3/4/P2. While most landfills generate some odors associated with uncollected (fugitive) LFG and leachate seeps, the LFG and leachate seeps affiliated with the reaction at an ETLF can produce odors that are particularly strong/offensive and possess unique character, causing them to be more detectable. The significant increase in odor complaints in the vicinity of CCL are attributable to the LFG and leachate seeps caused by this reaction.

In accordance with Condition No. 12 of the Stipulated Order, CCL has formed a committee of subject matter experts, the DMS Committee, to aid in the investigation, impact assessment, and remediation of the ongoing landfill reaction and resultant odors. The DMS Committee is conducting investigations and studies into the cause of the landfill reaction, its impact on air emissions, interim measures to limit odor transport, and corrective measures to reduce or abate the landfill reaction. The DMS Committee also reviews data each month and determines whether to revise the current boundaries of the reaction area.

Neal Bolton, P.E., President of Blue Ridge Services Montana, Inc. (BRS) is a national expert in landfill operations and is serving as a member of the DMS Committee to satisfy Condition No. 12(a)(i) of the Stipulated Order, which requires that the DMS Committee include a subject matter expert in landfill design and operational best management practices. Mr. Bolton is well-positioned to study the ETLF event at CCL and provide recommended solutions, due to his background with CCL and the solid waste landfill industry. He has provided various consulting support to CCL since 2020, including being part of the consulting team that solved the working face odor problem in 2022. Additionally, he has broad operational experience within the heavy construction and solid waste industry that spans more than 45 years. During that time, Mr. Bolton has provided operational support for more than 500 landfills throughout North America and abroad.

This report summarizes BRS's findings and recommendations pursuant to Stipulated Order Condition No. 12(b)(iv). Condition No. 12(b)(iv) requires BMPs to minimize the release of fugitive surface gas and minimize odors from fugitive surface gas, including cover practices at the reaction area and working face. We have determined from onsite reports from our staff and CCL staff, that the excess fugitive surface gas emissions, which appear to be driving the increase in odors, are the result of the landfill reaction. The fugitive surface gas emissions that are contributing to the current odor complaints are not coming from the working face. Further, regarding the generation of odor, the working face and area impacted by the reaction are unrelated – they are mutually exclusive. CCL is already employing numerous BMPs that go beyond industry best practices to mitigate fresh trash odors at the working face.

While Condition No. 12(b)(iv) requires only consideration of BMPs to minimize the release of fugitive surface gas and minimize odors from fugitive surface gas, this report also includes BMPs to address leachate odors. This report includes leachate BMPs because the reaction is also causing an increase in

leachate production, and leachate has the potential to cause odors that require different BMPs to mitigate than would be appropriate for mitigating fugitive surface gas.

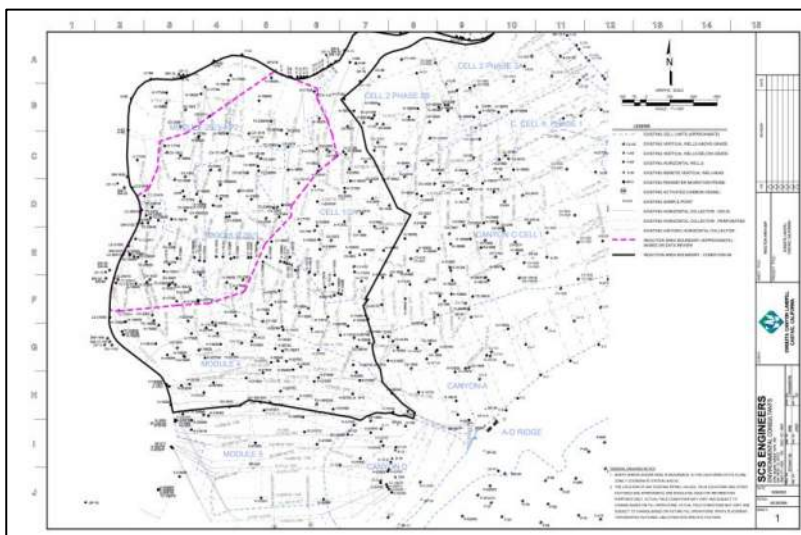
BRS's overall approach to this project – and this report – is to provide BMPs to minimize odors resulting from the landfill reaction, whether from fugitive surface gas, or leachate. The BMPs proposed to mitigate reaction odors are intended to be practical, reasonable, and cover a broad spectrum to address that specific problem.

The most challenging aspect of this project's solution, and the one that sets it apart from the BMPs that solved the working face odors, is the absolute need to reduce the quantity and concentration of odorous compounds *before* or *as* they are emitted. Under the current conditions, once the emissions reach the atmosphere, mitigation becomes impractical because of the size of the reaction area and the concentration of the constituents in the LFG. Because of this, the types of odor mitigation tools that CCL deploys at the working face (including misting systems, fans, and odor neutralizer), will not effectively mitigate the reaction odors. This report proposes the eventual deployment of a geomembrane or other synthetic cover over the entire reaction area, to be maintained for some duration while corrective measures are being implemented to slow and stop the landfill reaction. However, this cannot be accomplished until settlement normalizes. With respect to leachate, the report proposes BMPs that CCL should implement to address leachate seeps.

Because of the unique challenges of the landfill reaction, appropriate pre-emission controls are vital. For LFG, this includes expansion of the landfill gas collection system and increasing control capacity to effectively manage the increase in gas production from the reaction. For leachate, this includes a focus on dewatering wells to prevent leachate from emerging as seeps in the first place. Collectively, both of these measures will also remove heat from the reaction, which is the best method to slow down and ultimately stop the reaction. These concepts, however, are outside the scope of this report. A separate report required by Condition No. 12(b)(ii) will address solutions to slow and stop the reaction.

The Stipulated Order already requires CCL to increase its landfill gas collection and control system, add flaring capacity, and improve its dewatering capabilities. According to an update provided to South Coast AQMD on October 31, 2023, pursuant to Condition No. 15, as of October 25, forty-nine (49) vertical extraction wells had been installed to increase landfill gas collection. CCL is also operating a portable thermal oxidizer to increase flaring capacity, is adding a second thermal oxidizer, and will install a new permanent flare (Flare 3) by its November 24, 2023, deadline. Pursuant to Condition No. 17, the DMS Committee determined that there are twenty-five (25) wells in the reaction area with the worst liquid impaction issues. As stated in the DMS Committee's November 3 submission to South Coast AQMD, CCL has installed pumps at twenty-two (22) of these wells to improve dewatering capabilities. The report that will be prepared under Condition No. 12(b)(ii) will address the cause of the reaction and solutions to slow and stop the reaction, which may also address these practices and whether there is a need for continued expansion.

At CCL, a reaction deep within the landfill is generating LFG, leachate, and related odors, at an accelerated rate. Figure 1 shows the area where the reaction is occurring. The area outlined in pink (approximately 30 acres) shows the boundaries of the reaction area based on the DMS Committee’s review of data. For purposes of this recommendations in this report, when we refer to the “Reaction Area”, we are referring to the area outlined in pink. For the purposes of the SCAQMD



black is defined as the reaction area to ensure that monitoring and data collecting and certain practices like ensuring prompt repair of cracks in the soil are being conducted at an area larger than that which is currently exhibiting signs of the reaction (i.e., to be sure the reaction is not spreading). We refer to this area as the “SCAQMD Reaction Area.”

The following sections provide background on typical LFG generation and discuss two different potential sources of odor resulting from this reaction: LFG and leachate.

LFG is released during the decomposition of organic waste. LFG generated within the waste mass of most landfills has orders of magnitude higher odor potential than any other onsite source due to the sheer volume of the waste mass and the rate of gas production. Simple estimates indicate that one ton of waste may – over its full life of decomposition – generate more than 12,000 cubic feet of LFG. There are many factors that affect if, when, and how that LFG – and the associated odors – are released. These factors include waste characterization, climate, soil type, and quantity of waste.

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Under typical landfill conditions, the extraction of LFG is predictable and efficient, and LFG and the resulting LFG odors are fully controlled through a traditional LFG collection and control system.

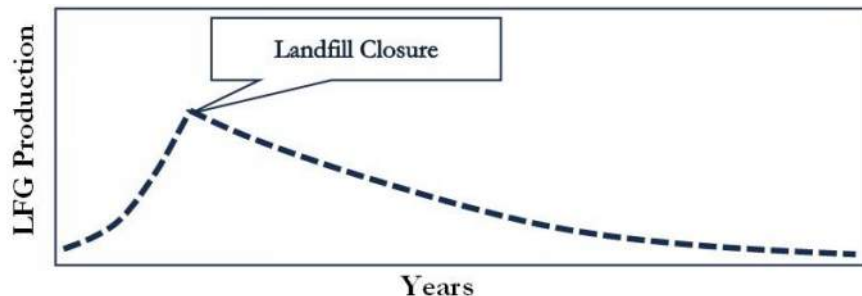


Figure 2 - Typical LFG Production Curve.

LFG Odors from Reaction

The most obvious and problematic odors are being generated because of the reaction. The reaction is producing an increase in total volume of LFG much greater than what is produced by normal decomposition within a typical landfill, which can increase odors. The spike in leachate generation has also created conditions where individual LFG collection wells impacted by the reaction are prevented from handling the current flow of LFG.

The LFG from the reaction also has atypical properties that increase odors. Of the odorous compounds released from that area, the most significant are H_2S , an inorganic sulfur compound, and other Total Reduced Sulfur (TRS) Compounds including DMS. DMS is not typically present in LFG at the concentrations at which it is seen in the reaction LFG. From an odor standpoint, mitigation is challenging due to the high concentration of DMS because this is not a constituent that typically needs to be addressed in LFG control systems. The emitted LFG also contains a high percentage (83%) of Carbon Dioxide (CO_2), making the overall density of the LFG more than 1.6 times denser than ambient air. (Note that these percentages are from a flux chamber study and only represent emitted gas; they are not indicative of the as generated raw LFG.)

These conditions produce a dense mass of LFG, with high concentrations of TRS. The report being prepared under Condition No. 26 will show modeling of how this LFG may move offsite.

Leachate Odors from Reaction

In the normal process of decomposition, moisture is released, along with the typical constituents of LFG, methane (CH_4) and CO_2 . Under normal conditions, that moisture creates an environment within the waste mass that is humid. In the same way that LFG is generated in a steady and predictable way, moisture generated in a typical landfill is also predictable and manageable. Liquid moisture (i.e., leachate) slowly moves downward toward the bottom of the landfill where it is collected by the leachate collection and recovery system (LCRS). Water in its gaseous state (i.e., within the LFG) is extracted along with other constituents by the LFG collection system. Much of that liquid drops out as condensate when LFG flows through the collection pipes (where it cools). Remaining moisture may be removed at the LFG plant prior to the LFG being flared or used as an energy source.

However, because of the reaction, the leachate generation rate, like that of the LFG, is much higher than normal. Liquid leachate is impacting some of the LFG collection wells, and some is also emerging as leachate seeps along the west and north slopes of the SCAQMD Reaction Area. When that leachate emerges on the surface of the landfill, it can be noticeably odorous and may contribute to the odors already being generated by the reaction LFG.

MITIGATION OF REACTION LFG ODORS

This section evaluates BMPs and alternative methods for minimizing odors caused by the reaction, from an operations perspective.

BRS recommends installing some form of geomembrane or other synthetic cap over the Reaction Area (see Figure 1, pink line) to contain excess emissions. This cap design will need to include a method for collecting and treating the LFG that is contained under the cap.

BRS has evaluated several other options, but determined they are either not feasible or will not mitigate the odors, including:

- Additional thickness of cover soil (as suggested in CalRecycle's October 16, 2023, letter to Ms. Karen Gork),
- Other Odor Control Systems,
- Biofilter system to treat emissions as they are released, and
- Various forms of alternative daily cover (ADC).

As previously noted, mitigation measures to occur before the sources of odor (LFG and/or leachate) reach the surface of the Landfill are outside the scope of this report. However, considering the many factors affecting the reaction, BRS suggests that mitigating odors must include expansion of the LFG collection system and increasing LFG flaring/control capacity and improved liquids removal.

Geomembrane or Other Synthetic Cap

BRS recommends installing a contiguous layer of geomembrane or scrim-reinforced synthetic material over the Reaction Area (see Figure 1, pink line) and the western and northern sloped areas adjacent to the Reaction Area. The material will be maintained for some duration while corrective measures are being implemented to slow and stop the reaction. Such a project will require detailed design work, including for the underlying piping that will convey collected LFG. This design work is outside the scope of this report.

The pros and cons associated with placement of any geomembrane in these areas must be carefully considered and there are unique operational challenges to placing such material that vary between the sloped portions and the plateau area of the Reaction Area. The cap must also be paired with an appropriate LFG collection and control system because the geomembrane alone does not solve the problem, it just contains and redirects the LFG.

The benefits of this type of cap include:

1. A cap would provide an absolute barrier to LFG emissions. Such a layer would restrict and redirect surface emissions to one or more points where the LFG can be collected and treated.
2. Placement of a geomembrane or other synthetic material would also help to control stormwater, primarily to keep infiltration (e.g., from rain) from adding liquid to the reaction.

Potential downsides include:

1. Placement of a geomembrane on any portion of the Reaction Area or adjacent slopes will force LFG emissions to the next path of least resistance. This could increase the potential for lateral gas migration, increasing emissions along the edge of the geomembrane.
2. Placement of geomembrane could also direct more gas toward the bottom of the Landfill where it could potentially change the chemistry of leachate.

Sloped Portions Adjacent to the Reaction Area

Condition No. 26 already requires the installation of a geosynthetic cover (geomembrane) over western portions of Module 2B/3/4 Phase 2, Module 2B/3, and Module 4 (western slope). BRS also understands that CCL is planning to install a geosynthetic cover over the northern slope that is adjacent to the Reaction Area. These sloped areas adjacent to the Reaction Area are places where CCL has seen leachate seeps emerge, as well as excess surface emissions. A geomembrane placed along the western and/or northern slope, especially where leachate seeps have emerged, could provide the important benefit of keeping stormwater from infiltrating and potentially adding to the subsurface flow of liquid within the waste mass where the leachate seeps are originating. In this way, adding the cover could help reduce/prevent leachate seeps.

On the other hand, if leachate emerges along the slope under the geomembrane, it could be difficult to detect until it emerges at the bottom of the slope. By that time, a significant portion of the slope could be affected. This could also create some level of slope instability. CCL should frequently inspect that area to allow for early detection of any potential problem.

Similarly, the placement of a geomembrane on the slope will focus all stormwater runoff to the toe of the slope. Thus, additional stormwater controls may be required at the toe of the slope to handle the increased runoff and prevent erosion. CCL should install stormwater controls at the toe of the slope (i.e., the bottom of the geomembrane).

Plateau Portion of the Reaction Area

Covering the entire Reaction Area with a geomembrane or other synthetic cover could be challenging because of the rapid settlement this area is experiencing. Even with the flexibility of high-density polyethylene (HDPE), linear low-density polyethylene (LLDPE), or other similar synthetic material, it could be difficult maintaining the integrity of a single contiguous geomembrane cap. In other words, a single contiguous geomembrane panel could potentially rip or be displaced due to settlement in the Reaction Area. This must be addressed during the design of any geomembrane placement.

Because of this, BRS recommends extending this cap over the plateau portion of the Reaction Area only once the settlement normalizes. Criteria for considering when the geomembrane cap could be removed would need to include the prevalence of odors emanating as a result of the reaction.

Means of Managing LFG Contained under Any Geomembrane

As noted above, placement of a geomembrane or other synthetic cover over the Reaction Area and adjacent slopes must be paired with a way of collecting and managing the LFG that will be captured by the cap.

BRS considered the following LFG management options that could be paired with the geomembrane to create an effective hybrid system:

1. Routing the collected LFG to the existing LFG collection and control system (i.e., flares.).

2. Routing the collected LFG to a portable thermal oxidizer such as the one currently used at CCL, or a larger unit sized to accommodate the flow of LFG from under the geomembrane.

BRS believes that either or a combination of both options would be suitable to pair with the geomembrane cap. An expert in LFG collection and control systems will need to design proper piping and determine the optimal solution to treat the LFG contained under the geomembrane or other synthetic cap.

Additional Cover Soil

BRS has reviewed the recommendation in CalRecycle's October 16, 2023, letter to Ms. Karen Gork, to place an additional 24 inches of soil on top of the "Reaction Settlement Area" (see Figure 3).

Cover soil provides some odor mitigation benefits. It should be noted that a minimal degree of stripping of methane, other Volatile Organic Compounds (VOCs), and Volatile Organic Sulfur Compounds (VOSCs) occurs as LFG emissions pass through daily and /or intermediate cover soil. This occurs when the bacteria on soil particles contacts and oxidizes various types of organic compounds.

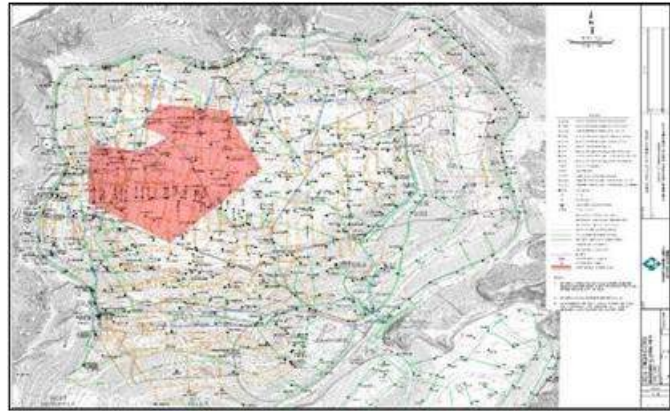


Figure 3 - Reaction Settlement Area map per CalRecycle Report.

However, there are many risks in placing additional cover soil on the Reaction Settlement Area. Because of these risks, BRS does not agree with this approach and suggests that CCL avoid placing additional weight on top of the Reaction Settlement Area. Additional soil cover could exacerbate the problem by:

1. Adding more weight, which could increase the rate and amount of settlement,
2. Insulating the Reaction Settlement Area, which could prevent release of internal heat,
3. Increasing settlement, which could potentially increase ponding and infiltration, and
4. Adding moisture to the Reaction Settlement Area, which could further accelerate the decomposition process.

Even though soil can provide some biofiltration, the potential benefit is not worth the risk. Further, the loading rate from gas emissions at most landfills generally exceeds the soil's treatment capacity. Loading rates from the Reaction Settlement Area certainly exceed the capacity of the existing soil, even with an additional 24 inches. Thus, any reduction in odorous compounds is likely to be minimal.

Other Odor Mitigation Systems

In accordance with Condition No. 12(b)(iv), BRS has considered the BMPs that were successful at controlling working face odors, including the use of misting systems, fans, and odor neutralizer, but has rejected them as potential mitigation measures to address the reaction odors. The working face odor mitigation measures will not be effective in controlling odors from the reaction due to a variety of factors, including:

1. The effectiveness of fans, even the very large orchard fans, will be minimal because of the characteristics of the LFG emissions at the Reaction Area. Moreover, placing fans within the Reaction Area could pose safety risks in terms of fan stability (i.e., fans becoming unstable or even tipping over), simply because of the rapid vertical and differential settlement occurring in that area.
2. The density of the emitted gas from the reaction is more than 1.6 times denser than ambient air due primarily to the higher concentration of CO₂ (approximately 83%). This makes mixing the air with fans, thermal air movement, and normal wind flow patterns more difficult because the odorous gas tends to settle in low areas, while ambient air flows over and around that dense mass of LFG. For a visual image, consider that vinegar is approximately 1.12 times denser than oil. Getting it to mix with oil requires lots of shaking (turbulence). Working face odors have nearly the same density as ambient air, making the mixing process much easier; fans were very effective at controlling working face odors.
3. The volume and concentration of odor-causing chemicals, namely DMS and H₂S, are much higher than that of the odorous compounds that were released at the working face. This makes dilution and oxidation – by fans and air turbulence – critical, but much more difficult.
4. The odor neutralizer is inadequate to successfully treat the flow of gas from the reaction. This is not a limitation of the odor neutralizer itself but is instead a result of the quantity and concentration of the emitted gas (DMS), its density, and the difficulty mixing the neutralizer with the gas. Again, think oil and vinegar.

Because of the challenges in treating the higher quantity, flow rate, density, and concentration of gas emitted from the reaction, these odor mitigation tools will be unable to provide effective control.

Biofilter Treatment System

BRS also considered a biofilter treatment system. There is much ongoing research about the ability of organic media biofilters to remove methane and other constituents from LFG emissions. The biofilter process has been shown to be effective, and biofilters are used to mitigate odors at various types of industrial facilities, including wastewater treatment plants, anaerobic digesters, and of course, landfills.

In many cases, biofilters are used at landfills to reduce methane emissions because methane is a powerful greenhouse gas. But in the process, biofilters can also significantly reduce VOCs and VOSCs.

Biofilters are typically constructed with a layer of organic media, such as wood chips, compost, shredded wood/bark, or a combination of those materials (See Figure 4).

When maintained within a certain moisture content, the organic particles in the biofilter become coated with a layer of biofilm. As air passes through the biofilter, many chemicals, including DMS and H₂S, may be attenuated and oxidized by the bacteria present within the layer of biofilm.

Most biofilters are constructed to a depth of 2-6 feet, depending on the type of media, design (gas) flow rate, concentration of target constituents, and other factors.

BRS considered whether it would be effective at CCL to strategically place a layer of organic material (i.e., compost, wood chips, shredded bark, or other similar material) as a biofilter on portions of the Reaction Area and along the edge of any geomembrane placed over the Reaction Area.

However, placing a biofilter to address a LFG issue of this scale comes with challenges – and some potential negative impacts. Effective biofilters require a specific moisture content – around 50%. Due to the weather conditions at CCL, to obtain the optimal moisture content, CCL would need to constantly add water to the biofilter. Since water infiltration could exacerbate leachate production, this is not recommended at this time. Even the logistics of maintaining a uniform 50% moisture content would be operationally difficult. Further, biofilters, which are made up of organic materials, may have their own odor issues, particularly when deployed at such a large scale. Adding a potential source of odors is not recommended.

For the time being, we have rejected the idea of utilizing a biofilter to pre-treat emissions at the Reaction Area.



Figure 4 - Jefferson County Landfill, WA. from EPA's Landfill Methane Outreach Program.

MITIGATION OF REACTION LEACHATE ODORS

At landfills, most leachate is generated when stormwater seeps through waste, in the same way coffee is formed when water drips through a coffee maker. The bacterial and/or chemical processes of decomposition may also produce or release moisture.

Some waste materials, such as food waste, sludge, or agricultural waste may begin with a relatively high moisture content, thus increasing the potential for leachate creation. Consider how a plastic bag of residential trash containing food or green waste might sweat after a few days sitting in a warm garage or trash bin. The decomposition process is producing water. That same phenomenon occurs in a landfill at a scale many orders of magnitude greater.

At CCL, the reaction is producing a significant quantity of liquid (i.e., leachate) in addition to the excess production of LFG due to the reaction itself creating water as a by-product.

Generation of Landfill Odors from Leachate Seeps

When there is an excess amount of liquid in a landfill, leachate can emerge from the perimeter landfill slopes in the form of a leachate seep. Leachate seeps are typically more common at landfills that receive significant rainfall and have fine-grained soils such as clay or silt. CCL does not receive significant rainfall and has limited fine-grained soil.

Leachate seeps are very similar to a natural spring one might find while hiking. Leachate seeps occur when liquid within the landfill moves downward, encounters a layer of low permeability material, then flows along the top of that layer, often emerging on a perimeter landfill slope.

Several leachate seeps have recently emerged at CCL – mostly along the slopes immediately west and north of the Reaction Area. This is driven by the increased moisture being generated by the reaction.

Because of its potential to contain bacteria, VOCs, VOSCs, and other chemicals, leachate from the reaction is odorous and may be adding to offsite odor complaints. In that regard, and from a regulatory perspective, control of those leachate seeps is important.

BMPs to Mitigate Odors from Leachate Seeps

Leachate odors may be reduced or eliminated by treating the leachate biologically or chemically. In some cases, odors from surface impoundments of leachate have been reduced by treatment with hydrogen peroxide, chlorine bleach, or potassium permanganate. BRS does not recommend any biological or chemical treatment of leachate seeps at CCL, because of the difficulty in applying, managing, and monitoring an appropriate concentration. Leachate seeps are typically inconsistent in flowrates, can vary in chemical composition, can relocate to different positions over time, and the application of biological or chemical treatment may require the leachate to remain standing at the seep location, which is counterproductive to odor abatement. These treatments typically work well in a leachate pond where the volume of leachate – and applied chemical – can be controlled. Chemical application is not practical in this situation and so we have rejected it as a treatment option.

Instead, BRS recommends implementing measures to eliminate the seeps. This is a practical approach because the most effective way to reduce leachate odors from the leachate seeps is to eliminate the seeps. Leachate within the Landfill's waste mass poses virtually no potential to cause odors.

In some cases, minor seeps may be corrected by simply placing additional soil on that portion of the slope, like a patch on a leaky tire. If the patch doesn't work, it may be necessary to excavate into the slope at, or just above, the seep. The seeps occurring at CCL are large enough that patching will not be an effective long-term solution. BRS recommends that CCL undertake a more significant and permanent fix to reroute the leachate and prevent it from becoming exposed to air, which is, in fact, the process that CCL is currently undertaking.

To eliminate the seeps near the Reaction Area, CCL is excavating a trench along the contour of the western slope and slightly above the level of the emerging leachate (See Figure 5). The trench excavation extends below (i.e., through) the low-permeability layer that is acting as a quasi-liner.



Figure 5 - Leachate Seep Remediation – north edge of reaction area.

The trench is then backfilled with drain rock (creating a French drain) and capped with cover soil to match the adjacent slope(s). Because of the apparent high flow rate of the leachate seeps, the trenches are at least 2 feet wide, to help prevent sediment from plugging the drain rock in the French drain. This method allows leachate to flow downward within the Landfill where it can be captured by the liner and leachate collection system.

In the event leachate must be transported from a leachate seep to a tank or other collection or treatment location, it should be transported with a vacuum truck or via pipes, rather than in a ditch. Leachate that is exposed on the surface of the Landfill may produce a significant quantity of odor. This is particularly concerning due to the high odor potential of gas and liquid (i.e., leachate) generated by the reaction. There is additional risk that leachate may contact stormwater as the wet season approaches, so there should be control measures in place to ensure any such leachate is contained and removed via vacuum truck.

Until the leachate seeps are fully mitigated, CCL should continue utilizing vacuum trucks to extract leachate from active seeps to several “Baker” tanks. These tanks provide secure temporary storage for leachate until it can be transported to an offsite treatment facility (See Figure 6).

CCL is and should continue following a strict set of BMPs. The entire leachate mitigation process has multiple important BMPs:

1. Develop written Standard Operating Procedures to ensure consistency between works and shifts.
2. Regular inspections of the slopes west and north of the Reaction Area:
 - a. Look for wet spots or horizontal bands of wet soil.
 - b. Look for bands of vegetation that are green or lusher.
3. Immediately contain any seep using dirt / soil berms or dams, or by digging a hole.
4. Immediately contact Site Management to report seep location.
5. If required, contact appropriate agency if seep is off the landfill liner footprint.
6. To repair the seep, a variety of actions may be appropriate, depending on the specific nature and location of the seep. As needed, CCL should take a combination of the following steps to repair the seep:
 - a. Cover seep with dirt and monitor to confirm that the seep stops.
 - b. Dig a hole into waste to redirect seep for downward drainage.
 - c. Pump any contained liquids into LCS or tanks or trucks.
 - d. Install sumps (vertical or horizontal perforated pipes surrounded by drain rock).
 - e. Install pumps, air supply lines, and liquid conveyance lines to & from sumps.
 - f. Install horizontal perforated pipes with drain rock or manufactured textiles.
 - g. Install solid pipes to convey liquids.
7. Once seep is repaired, cover the area with clean soil and compact accordingly.
8. Monitor seep periodically for any breach or issues.
9. Currently, seep liquids are contained in concrete ditches & channels, these ditches and channels should be controlled using dirt berms / dams to prevent commingling with stormwater and allow for quick removal via vacuum truck.
10. Ensure vacuum trucks are available on site daily to pump liquids from any ditch or channel and transfer liquids to the onsite storage tanks.
11. Onsite storage tanks should be consolidated in a few primary areas (as opposed to being spread across the landfill) and there should be appropriate vacuum on tank farms to prevent odors.
12. Tankers should be available to remove liquids from the onsite storage tanks and transport the liquids to an approved POTW for proper disposal.
13. CCL should ensure that there is sufficient capacity for offsite disposal and sufficient tankers for transport to align. Insufficient capacity for either may require CCL to increase the number of onsite storage tanks.



Figure 6 - Baker Tanks for temporary leachate storage.

CCL should continue its efforts to address the leachate seep on the western slope by digging into the waste to redirect the leachate and prevent it from surfacing. CCL should also continue to employ the above best management practices for addressing leachate seeps and managing leachate onsite to minimize odors.

CONCLUSION

Condition 12(b)(iv) requires BMPs and alternative methods to minimize the release of fugitive surface gas and minimize odors from fugitive surface gas. As explained above, the scope of this report has been expanded to address BMPs and alternative methods to minimize odors resulting from the landfill reaction, including both fugitive surface gas and leachate.

In summary, BRS recommends CCL take the following actions:

- As required by the Stipulated Order, continue to expand the LFG collection system and flaring/control capacity, and continue to improve dewatering capabilities.
- As required by the Stipulated Order, install a geomembrane cover on the western slope of the Reaction Area.
- Install a geomembrane or other synthetic material cover on the northern slope of the Reaction Area.
- Once settlement at the Reaction Area has normalized, install a geomembrane or other synthetic material cover over the plateau portion of the Reaction Area.
- Continue reconstructing the western slope to mitigate leachate seeps in the area and prevent them from exposure to the surface.
- Continue implementing BMPs for addressing leachate seeps and managing leachate onsite.