

**Application for Major Conditional Use Permit  
Cannabis Cultivation (Up to 10,000 Sq. Ft.), Retail and Distribution  
Sonoma CHO  
Sonoma CHO, LLC dba Flora Terra  
1825 Empire Industrial Court, Suite A**

Proposed Use: Cannabis Cultivation/Nursery (greater than 5,000 sq. ft), Retail and Distribution  
Owner: Ramona Crinella  
Applicant: Sonoma CHO, LLC dba Flora Terra  
Address: 1825 Empire Industrial Court, Suite A  
APN: 015-731-008  
Zoning: PD 0173-RC  
General Plan: Light Industry  
Building Size: 17,650 sq. ft. (Suite A approx. 10,400 sq. ft.)

**INTRODUCTION**

Sonoma CHO, LLC dba Flora Terra (the “Applicant”), proposes to occupy approximately 10,400 square feet (“Suite A”) of an existing industrial building located at 1825 Empire Industrial Court (the “Building”), Sonoma County APN 015-731-008 (the “Parcel”), and obtain a Major Conditional Use Permit for indoor cannabis cultivation (including nursery) and for the operation of a cannabis distribution and retail facility. The site was formerly occupied by a sign company, KVO Industries- a service oriented sign company- which occupied Suite A, the southernmost portion of the building. The northernmost portion of the building will is vacant.

Although the Parcel itself was not damaged by the October 2017 fires, many properties in the immediate vicinity were destroyed or damaged.

This project does not involve any exterior modifications to the Building or the surrounding site, other than landscaping upgrades, security upgrades, installation of bike racks, and new exterior paint using neutral tones. Several existing roll-up doors will be permanently locked and will not be used by the Flora Terra’s operations.

The City of Santa Rosa passed Ordinance 4060 in March 2016. The ordinance allows for the permitting of commercial cultivation sites in the IL and other zones. On December 19<sup>th</sup>, 2017, the City passed Ordinance ORD-2017-025 to regulate, among other things, the issuance of permits for cannabis retail and distribution uses in IL and other zones. The ordinances allow for the combination of cultivation, retail, and distribution uses. Santa Rosa City Code section 2046.050(D) allows for multiple permits to be issued at a single parcel, provided all the uses are authorized by both local and state law.

At the state level, Title 16, Section 5500 of the California Code of Regulations provides for the microbusiness (or “Type 12”) license, which allows a business to conduct cultivation/nursery (up to 10,000 sq. ft.), retail, and distribution activities on the same premises, as proposed here.<sup>1</sup>

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<sup>1</sup> The microbusiness license requires the licensee to conduct at least three types of commercial cannabis activity. Therefore, in the event that the City does not authorize all three types of proposed commercial cannabis activity (cultivation, distribution, and retail), Sonoma CHO will seek separate cultivation and distribution licenses, covering

## **CONDITIONAL USE PERMIT**

The application for conditional use permit is attached.

## **ADDITIONAL DOCUMENTS**

The following are included with this Project Description:

- Application form (with attached site plan, floor plans, and neighborhood map);
- Maps showing surrounding land use and surrounding zoning;
- Map showing setback from closest schools;
- Pre-Application Neighborhood Meeting form (with attached plans and maps);
- Storm Water Determination Worksheet;
- Disclosure Form;
- Draft letter concerning traffic impact study; and
- Draft lighting diagram

## **NEIGHBORHOOD MEETING**

The Parcel site is located within 300 feet of residential uses. Thus, a neighborhood meeting is required, and took place April 9<sup>th</sup>, 2018. At the neighborhood meeting, three neighbors raised a variety of concerns including security, loitering, and consumption. The Applicants addressed these concerns by highlighting the Flora Terra business model, customer code of conduct, and security protocols.

Additionally, in an attempt to exceed the minimum community outreach requirements, the Flora Terra team has met with the board of the Coffey Park Rebuild committee. In this discussion, the Flora Terra team presented the project and fielded questions. The response from the board members was, in large part, inquisitive, positive, and supportive. A few members of the board even inquired about job opportunities at the dispensary.

## **CRITERIA FOR SELECTION IN THE EVENT OF COMPETING APPLICATIONS**

Pursuant to City Code section 20-46.080(D)(1), cannabis retail uses may not be located within 600 feet of each other. Under an urgency ordinance effective February 6, 2018 (ORD -2018-002), the City will evaluate Flora Terra according to a points-based merit system addressing (A) local and state compliance, (B) neighborhood compatibility, (C) neighborhood enhancement, and (D) site management.

This project deserves strong marks in all of these categories. This section summarizes the project's strength in each category. The rest of this Project Description provides greater detail.

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the separate activities, instead of a microbusiness license. California Business and Professions Code section 26053(c) provides that a business may obtain multiple different licenses.

## **I. Local and State Compliance**

Flora Terra is highly compliance-minded and has retained experienced local counsel to ensure compliance with all state and local laws and regulations.

### *State Regulations*

Flora Terra's plans for the Building meet all the requirements to operate as a Type-12 microbusiness licensee. The Building will have secure, limited-access areas in which cultivation and distribution activities will occur separate from the proposed retail space. Furthermore, Flora Terra is in the process of fulfilling all the requirements necessary to obtain an annual state license, including:

- Enrollment with State Water Resources Control Board. As required under 16 CCR § 5501(a), Flora Terra will apply for coverage under the State Water Resources Control Board's water protection program (the "Cannabis General Order," Order WQ 2017-0023-DWG).
- Hazardous materials record search. As required under 16 CCR § 5501(b), Flora Terra has conducted a search of the EnviroStore database for the project site. No hazardous sites were encountered.
- Preparation of detailed plans for cultivation operations. As required under 16 CCR §§ 5501(c)-(f) and 5502, Flora Terra is developing detailed plans for the configuration and operation of its cultivation facility. Draft diagrams with the required details concerning the areas to be used for canopy, chemical storage, processing, packaging, waste, and cannabis storage are under development. Draft lighting diagrams for the flower and propagation rooms are attached as well.
- Pest Management Plan. Flora Terra will develop a pest management plan as required by 16 CCR § 5502(d).

### **CEQA**

The project satisfies the requirements of the California Environmental Quality Act ("CEQA"), California Public Resources Code § 21000 *et seq.*, and the CEQA guidelines, title 14 of the California Code of Regulations, chapter 3, § 15000 *et seq.*, because it is categorically exempt under CEQA guidelines section 15301, for modification of existing facilities.

The project does not meet the exception thresholds of 15300.2 (the exception to the exemption): the location is not in a particularly sensitive environment; there are no cumulative impacts anticipated by similar reconstruction projects; there are no unusual circumstances relating to the project that would suggest a significant effect on the environment would be caused; and the site is not a scenic highway, hazardous waste site, or the location of historical resources.

Additionally, the project does not require additional environmental review because it is consistent with Santa Rosa's General Plan 2035, for which an EIR was certified in 2009 and amended in

2012. See “Santa Rosa General Plan Policies,” below, for a discussion of this project’s compliance with the City’s General Plan. Thus, the project qualifies for a statutory exemption under CEQA Guideline 15183.

### *County and Regional Permit Requirements*

Upon approval of Flora Terra’s Use Permit, Flora Terra is prepared to comply with all applicable Sonoma County requirements, including securing a permit from the Department of Health Services for the sale of edible products.

### *Santa Rosa General Plan Policies*

This project furthers the General Plan’s policies for long-term economic development reflecting the aspirations of the community.

First of all, the project is in line with the “guiding principles” of the General Plan. It will add to the quality of life by providing a consumer good that has long been demanded by Santa Rosa residents but has previously been relegated to the black market. It will require no new infrastructure to be developed by the City. It will also provide multiple jobs and help revitalize an area of the City that was devastated by the October 2017 fires.

Second, the “Light Industry” land use designation assigned to the Parcel and surrounding area under the General Plan is significant. The Light Industry land use category accommodates light industrial uses and commercial activities requiring large space needs. Because the project includes cultivation and distribution uses, which require far greater space than retail uses, it is more consistent with the Light Industry land use designation than a retail-only project would be. Although allowed in the IL zoning district under the City’s cannabis ordinance, retail-only cannabis applications lack a truly industrial character. Unlike the Applicant’s project, retail-only projects are more appropriately located in areas with the Retail and Business Services land use designation. The nature of the Project, as a microbusiness, combining industrial and retail uses, makes it perfectly suited to occupy the Parcel and for the overall neighborhood.

The fact that this project is for a microbusiness, rather than just a retail site, also enhances the general economic impact of the project. Because it will involve cultivation and distribution as well, the project will create more jobs and economic value for the City than a retail-only establishment alone could.

Finally, as described in greater detail in the “Cultivation Operations” section, below, this project is consistent with various General Plan goals and policies concerning environmental impact. This project will be a model of sustainability, utilizing high-efficiency LEDs, significantly reduced solid waste and water usage compared to traditional cultivation, and essentially no wastewater production.

## *Santa Rosa Locational and Operational Requirements*

As further explained in the “Zoning and Setback Issues” section below, this project falls well within the City’s location requirements, which allow retail cannabis uses in the IL zoning district. The project site is more than 1,200 feet from the closest school, which is more than double the required setback of 600 feet.

As explained in the following sections, Flora Terra is prepared to comply with all of the “General Operating Requirements” of City Code Section 20-46.050.

### **II. Neighborhood Compatibility**

As described through the following sections, this Project is a good match for the surrounding neighborhood. There is ample parking to support the proposed use, a comprehensive security plan as required under local and state laws will be put into place, and there will be no significant physical change to the Building or the surroundings.

There is ample space to install attractive bike parking around the Building, including in the parking lot, and Flora Terra will satisfy whatever conditions the City imposes in that regard.

The retail component of this project will utilize quality materials and provide for an aesthetically pleasing retail experience. Renderings of the retail space and the exterior are attached.

Additionally, the existing portion of Empire Industrial has always been used for intense commercial and industrial activities. Several auto-service companies are currently located along this stretch of Empire Industrial, which generate far greater noise and impact to the neighborhood than the Flora Terra’s proposed use.

### **III. Neighborhood Enhancement**

As described throughout this Project Description, this project will be well-integrated with the neighborhood and will bring various community benefits. The project will not require any significant alteration of the Building, nor will it require a change to the location of driveway or expansion of parking. It will employ around 10-14 employees. Moreover, because the project includes cannabis production and distribution, it will be a key early participant in the local cannabis supply chain, which is still in its infancy and is crucial to the viability of the new regulated cannabis market.

The project is also notable for its environmental friendliness, as explained in the “Cultivation Practices” and “Water Use and Wastewater” sections, below.

Furthermore, Flora Terra will upgrade the physical appearance of the site, including landscaping to include native drought resistant plants, installation of bike racks, and an attractive retail space. The retail space will be designed to showcase modern elegance using high quality materials, as shown in the following renderings. The result will be a significant improvement to the aesthetics of the neighborhood.



**Site Exterior**



**Interior Retail Space**

Flora Terra also wishes to contribute to community programs geared towards revitalizing the Coffey Park neighborhood:

*Donations to Benefit Coffey Park*

For its Grand Opening weekend and for one weekend per year thereafter, Flora Terra will contribute an amount up to 5% of its profits for the weekend towards Santa Rosa's efforts to rebuild and maintain recreational facilities in the Coffey Park neighborhood. Flora Terra will work with the City to determine the proper way to make such contribution.

*Support of Substance Abuse Programs*

Flora Terra will commit to supporting local outreach programs aiming to educate the public about the responsible use of cannabis. In addition to lending support to efforts by the City and local groups, Flora Terra will distribute non-branded pamphlets containing guidelines for safe and responsible practices for cannabis consumption. Flora Terra will coordinate its efforts with the City's efforts in this regard.

## *Community Outreach*

Flora Terra desires to be a good neighbor, and a first step in that is communication: finding out what concerns the community has with cannabis and, more specifically, a cannabis dispensary. Flora Terra will strive to address and mitigate such concerns. To that end, with the City's permission Flora Terra will host a series of public "meet-and-greet" gatherings at the Building in advance of the grand opening and after operations commence. The purpose will be for Flora Terra's representatives to introduce themselves to neighbors and to listen to and discuss their concerns.

Additionally, as previously highlighted, the Flora Terra team has met and are working with the Coffey Park Rebuild organization to ensure that Flora Terra operates as a welcome, contributing business member of the neighborhood. To that end, both Jeff Okrepkie, President of the Coffey Strong organization, and John Bly are available to serve as references for the Flora Terra team and this project.

## **IV. Site Management**

### *Personnel – Bios*

The individuals below comprise Flora Terra's management team.

#### *Principals: David Wingard II (CEO) and Alicia Wingard*

Flora Terra's principals, David and Alicia Wingard, are experienced professionals with deep connection to Sonoma County, having resided here for nearly 15 and 20 years, respectively.

**David** has extensive experience running businesses, including start-ups. In 2009 he started his first venture, D.W. Electric. The electrical company thrived in San Francisco and the Bay Area, performing commercial and residential services to select clients and projects. In 2013 David added a solar certificate to his contracting repertoire, and became specialized in solar installation design and service.

**Alicia** has over 12 years of experience successfully delivering quality customer service, developing business relationships, and collaborating with teams to ensure efficient operational support. She is the Executive Assistant for D.W. Electric, where she manages the customer service aspect of the business while overseeing schedules, calendars, billing, and inventory. Additionally, Alicia is a Registered Nurse working in Sonoma County. As business professional, Alicia has a strong history working in fast-paced environments and contributing to business success at all organizational levels. Alicia's experience positions her well to oversee Flora Terra's business operations and financial activities.

#### *Business & Management Plans*

Flora Terra will implement detailed operational plans to address security, odor control, and day-to-day operations. See subsequent sections for detailed descriptions of the various components of Flora Terra's business and management.

Flora Terra has long term relationships with licensed suppliers and vendors; they are under contract with SC Labs for testing products grown in-house, and they are members of the Sonoma County Grower's Alliance to support local industry and to contribute to the County's robust cannabis economy. Additionally, Flora Terra has relationships with several key individuals with extensive experience in Santa Rosa Cannabis operations who will bring their expertise to bear in support of the development of Flora Terra's business model.

Finally, as referenced previously, the Flora Terra team has worked to build relationships with the Coffey Strong neighborhood rebuilding organization. As a result of that outreach, two members of the group's leadership team, **Jeff Okrepkie** and **John Bly**, have agreed to make themselves available as references for the Flora Terra team and the project.

## **ZONING AND SETBACK ISSUES**

### *Setback from Schools*

California Business & Professions Code section 26054 requires cannabis licensees to be at least 600 feet from grade schools, day care centers, or youth centers. Santa Rosa has not set a different required radius. The Parcel easily meets this requirement. The closest school is Schaefer (Morrice) Charter, which is at least 1,273 feet away. The next-closest school is North Valley School, which is approximately 1,642 feet from the Parcel. A map showing these distances is attached.

## **BUILDING CHANGES**

### *Exterior Modifications*

This project requires no modifications to the exterior of the Building other than the superficial enhancements, security requirements, and landscaping upgrades. See above for conceptual rendering of the Building exterior.

### *Interior Modifications*

The floor plans submitted with the permit application are compliant with California Building and Fire codes and describe the internal modifications to the Building, including the layout and square footages for the various planned uses. See above for conceptual rendering of the interior retail space. See attached for site plan A-0 and Construction Layout A-2.1 which outline the proposed areas for cultivation, retail, and distribution operations.

## **PARKING ANALYSIS**

As shown on the attached Site Plan A-0, City of Santa Rosa Zoning requires 14 parking spaces; Flora Terra has 47 available on site.



## **TRAFFIC**

The staffing for this operation will comprise approximately ten (10) full-time employees, with up to six (6) employees on-site at a time. Employees will arrive and leave daily for work shifts between the hours of 7:00AM and 10:00PM. Hours of Operations will comply with City of Santa Rosa requirements, including restrictions on hours for retail operations. Non-retail operations will continue until 10:00PM during harvest periods, but generally will cease earlier. The employees will monitor the cultivation and conduct day-to-day the operations. Additionally, Flora Terra will contract with a security patrol service to provide overnight security guard patrol.

The retail business hours will be from 9:00AM to 9:00PM. Customers will visit the site during those hours but will only have access to the part of the Building devoted to retail use.

The only additional vehicle traffic will be the arrival and departure of deliveries to and from local manufacturing companies. Deliveries to and shipments from the facility will occur up to two (2) times per week. These deliveries and shipments will be by van-sized vehicles and will utilize the sally port at the back of the Building.

Flora Terra hired W-Trans to complete a focused traffic study to examine the potential change in trip generation associated with Flora Terra's business. The review indicates less-than-significant traffic impacts.

## **SITE SECURITY**

Flora Terra is in contract with First Alarm to implement security systems and protocols. The Building will employ security measures as required by Section 20-46.050(G) and Title 16, Sections 5042 through 5047, of the California Code of Regulations, as outlined below:

### *Entrance Security*

- Customers will enter Flora Terra through the front entrance where they will have their age verified by staff upon entry.
- All employees will enter the premises through an employees-only door that will require key pad or fob entry.
- On-site security personnel compliant with Chapters 11.4 and 11.5 of Division 3 of the California Business and Professionals code will be present.

### *Shipping/Receiving*

- Designated delivery drivers will enter/exit the premises via the secure sally port located at the back of the building.
- Because the majority of raw cannabis will come from within the facility, deliveries will mostly consist of smaller items such as edibles, concentrates, and supplies.

### *Security Cameras*

- Flora Terra will have 35 high-definition (HD) security camera monitoring and recording 24-hours per day, seven days per week. Cameras will monitor all entrances and exits to and from the premises, and all limited-access spaces within the business, including all places where cannabis or cash is handled, processed, or stored.
- Video recording shall be maintained for a minimum of 90 days and shall be made available to the City of Santa Rosa, the City Police Department, or a designee upon request.

### *Alarm System*

- Flora Terra will have a professionally installed, maintained and monitored alarm system from Frist Alarm. All doors will require the use of a key fob. Windows are equip with glass breaking sensors, motion sensors will be installed to detect entry and exit from all secure areas, and panic buttons installed in appropriate locations.

## **PRODUCT INVENTORY**

The planned storage areas are sufficient to store the quantities of cannabis to be produced. Inventory controls and loss documentation procedures will be implemented. An inventory control system created by BioTrackTHC will be implemented and will comply with state track and trace program requirements. All cannabis and cannabis products produced, distributed, or sold through the facility will be inventoried into the system. This system will keep track of all movement of all products on and off the premises. All employees will be trained to report loss or theft immediately to the company and the City of Santa Rosa.

Using the BioTrackTHC system, all inventory-related information will be continuously maintained and accessible. The system includes an integrated point-of-sale and menu system, and it also integrates with Metrc, California's mandatory track-and-trace system, so inventory and sales information can be sent to Metrc automatically in real-time.

## **EMPLOYEE HIRING/TRAINING**

Flora Terra will hire experienced experts to train employees on product safety and best management practices. All employees will submit to and pass background check as required by state law. Hiring practices will focus on the Santa Rosa and Sonoma County employee pool. Employees and managers will receive extensive training on safety and best management practices, the requirements of Santa Rosa ordinances, California regulations, and the requirements of Flora Terra's permits and licenses.

## **CULTIVATION OPERATIONS**

Flora Terra proposes to devote a total of 8,979 sq. ft., of floor space for cultivation operations which include propagation and growth of immature plants, curing, and processing.

David Wingard II will oversee the cultivation operations. He has extensive experience running such operations and has been doing so for nearly a decade. He is particularly experienced with indoor cultivation, which benefits from his background as an electrician. He is a California licensed electrical (C-10) and solar (C-46) contractor and has designed electrical systems, grow rooms, and photovoltaic arrays.

Drawing on Mr. Wingard's expertise, Flora Terra will employ state-of-the-art cultivation techniques that are energy efficient,<sup>2</sup> produce essentially zero wastewater, and drastically reduce other waste products compared to traditional approaches. The features of Flora Terra's approach include:

- LED-based grow lights, which will use approximately one-third as much power as traditional lighting systems;
- use of soil mixes that do not need to be disposed of—they can be repurposed and reused;
- no use of “NPK” (nitrogen/phosphorus/potassium) fertilizers;
- instead, use of a sugar-based plant food system (“Original CHO” and related products, produced by SmartGrow Systems) that maintains optimal soil conditions for each stage of the grow cycle;
- no need to inject CO<sub>2</sub> into grow rooms; and
- significantly reduced water usage compared to traditional methods.

## **DISTRIBUTION**

Cannabis distribution operations will be conducted onsite to enable Flora Terra to have an internal distribution system. A total of 421 sq. ft. will be utilized for distribution operations which include a packaging room and the secured sally port. Activities include interacting with lab facilities to ensure quality control and lab testing, collection of taxes, transporting cannabis products to and from labs and other vendors, and logistics.

## **RETAIL: STOREFRONT**

Flora Terra will operate a retail dispensary using 1,000 sq. ft. of floor space. The dispensary will serve adult-use customers.

In the future, Flora Terra also plans to conduct retail delivery services to customers located outside the retail facility. Delivery services will employ company-owned vehicles and include delivery to locations within Sonoma County, to the extent each local jurisdiction allows. Flora Terra will

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<sup>2</sup> Moreover, Flora Terra's future plans include installation of a photovoltaic solar array on the roof of the Building. This will reduce Flora Terra's carbon footprint even more.

comply with all Santa Rosa and state requirements concerning delivery operations (*see* Title 16, Sections 5415 through 5421). Delivery procedures will include:

- vehicle will be equipped with a GPS device owned by licensee and used for delivery only, so that Flora Terra can track its location at all times during delivery;
  - vehicle will be equipped with LoJack for recovery in the event of theft;
  - vehicle will be equipped with dash-mounted video camera;
  - drivers will be at least 21 years of age;
  - vehicle will be equipped with an active vehicle alarm system;
  - drivers will not carry goods valued in excess of \$3,000 at any time;
- receipts will be prepared for each delivery request and will be signed by the customer.

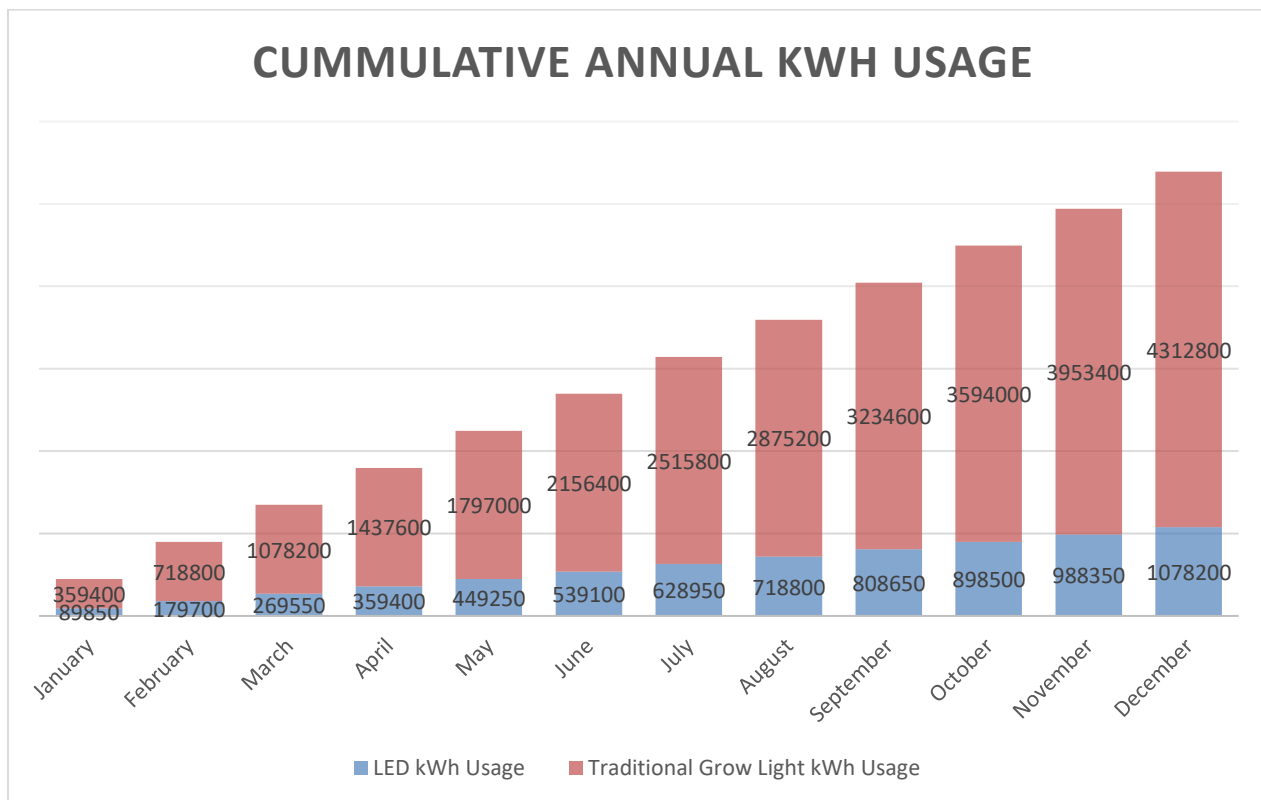
### **ODOR MITIGATION AND AIR QUALITY**

Flora Terra has retained Jason Vander Veen, a licensed mechanical engineer, as required by Section 20-46.050(H), to certify an odor mitigation plan. Please see the attached Odor Control Letter, attached.

## **LIGHTING**

Interior and exterior lighting shall utilize best management practices and technologies for reducing glare, light pollution, and light trespass onto adjacent properties. Exterior and interior lighting will comply with the standards set forth in Santa Rosa Ordinance section 20-46.050(I). An interior lighting diagram for the cultivation operations is attached,

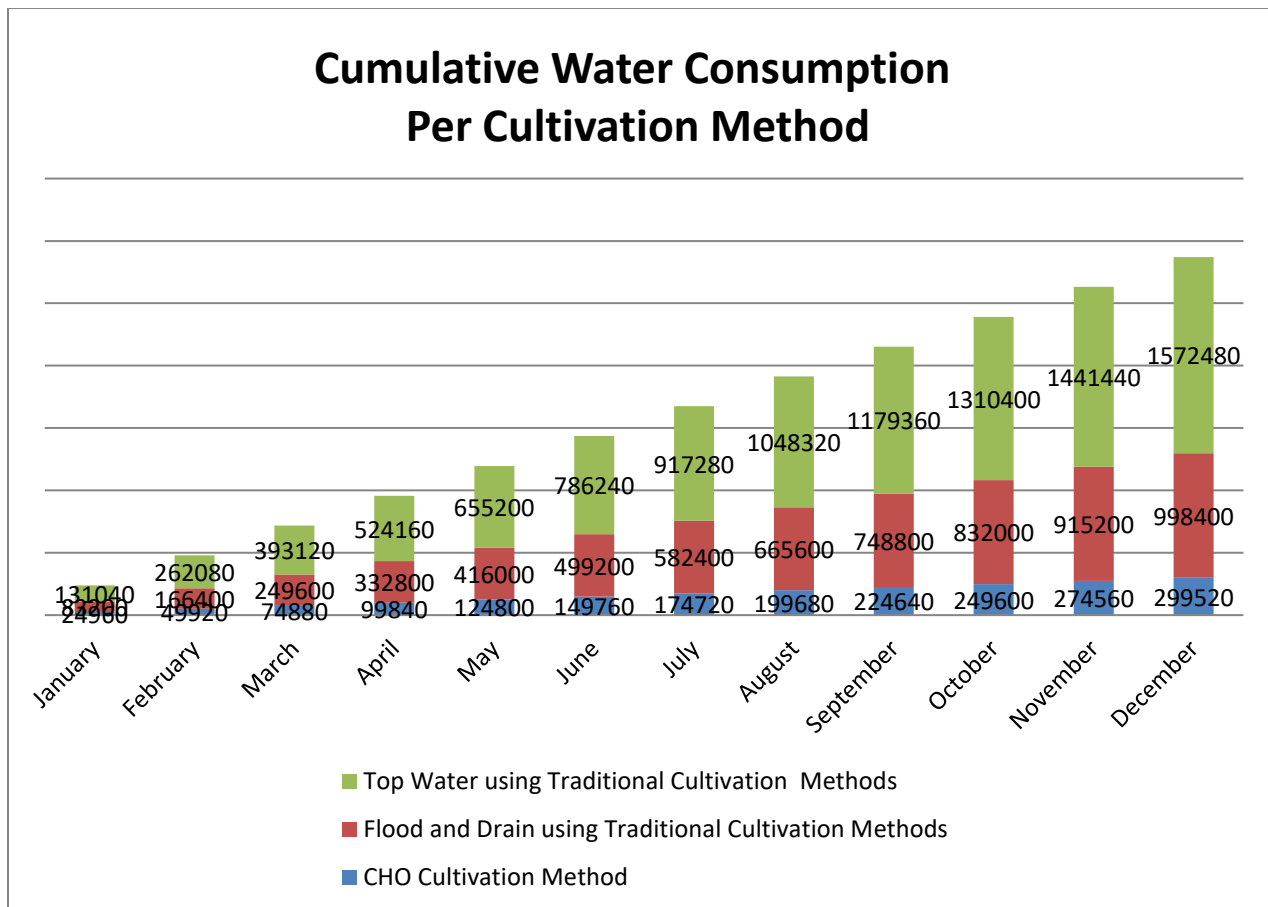
While the majority of cultivators utilize traditional lighting methods, the Flora Terra team has elected to implement LED lighting in an effort to reduce their carbon footprint. As the chart, below, indicates, Flora Terra's choice of LED lighting will result in significantly reduced Kwh usage. With traditional growing lights, usage would exceed 4,000,000 Kwh/year. Using LED lighting, Flora Terra expects to use just over 1,000,000/year, a reduction in usage of roughly 75%.



## WATER USE AND WASTEWATER

### Water Use

As can be seen in the attached chart, labeled Annual Water Usage, Flora Terra’s chosen watering method, the “CHO Method” requires significantly less water than either a “top water” or “flood and drain” cultivation method. Where the “flood and drain” method would utilize in excess of 1,500,000 gallons, annually, the CHO method requires less than 300,000 gallons.<sup>3</sup>



<sup>3</sup> CHO Method: With just under 10,000sqft of canopy space there are 208 lights per room x 4 pots per light x 4 rooms = 3,328 pots total x 0.75 gallons of water used per pot x 10 waterings per month = 24,906 gallons of water used each month.

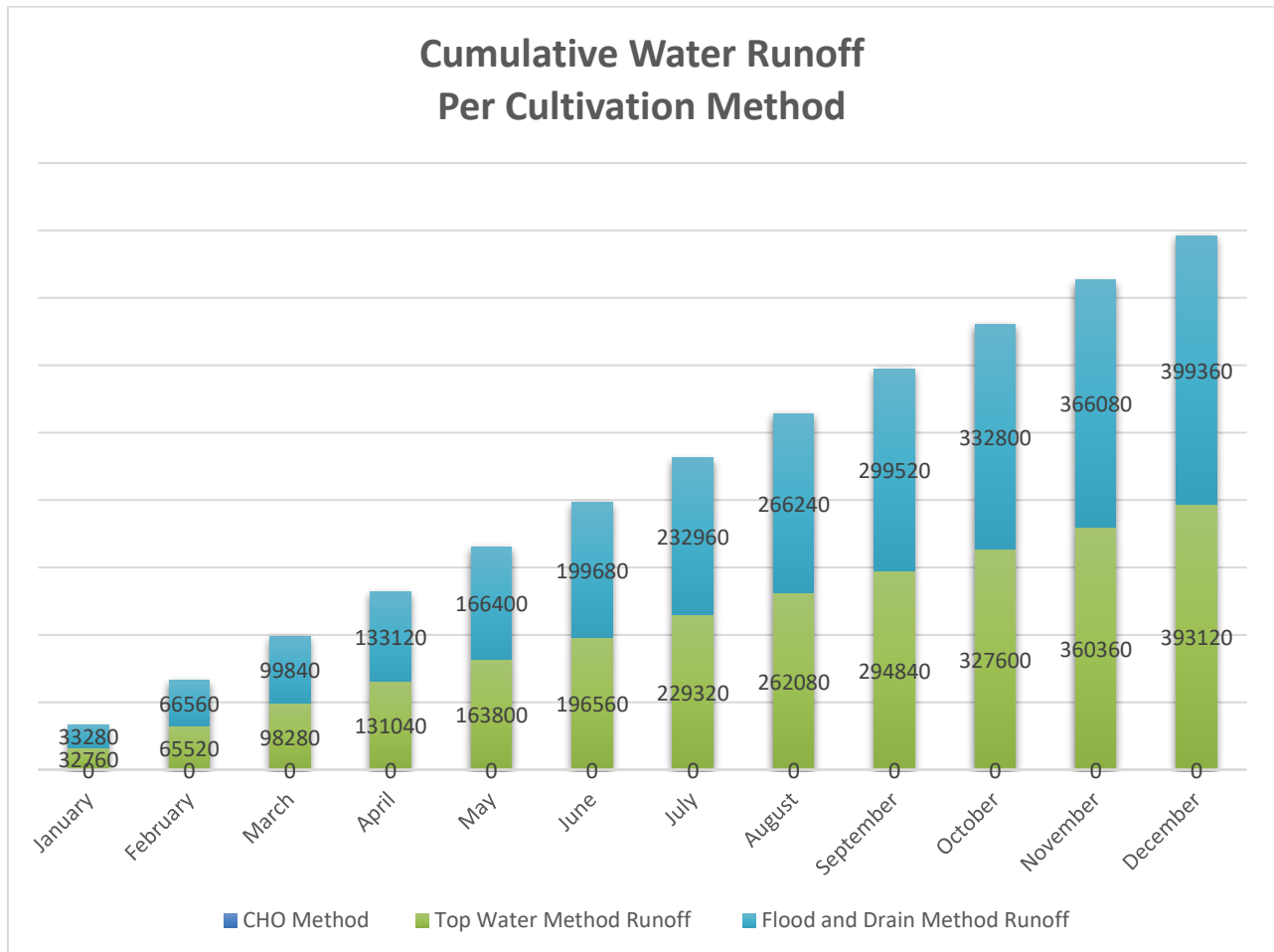
Top watering for traditional cultivation methods:\* with just under 10,000 sqft of canopy space, water consumption is calculated as follows: 208 lights per room/ 2 lights per tray = 104 trays per room x 21 pots per tray x 4rooms = 8,736 pots x 1 gallon of water per pot x 15 waterings each month = 131,040 gallons of water used each month.

Flood and drain with traditional cultivation methods\* with just under 10,000sqft of canopy space water consumption is calculated as follows: 208 lights per room/ 2 lights per tray = 104 trays per room x 4 rooms = 416 trays x 50 gallons per tray x 4 waterings each month = 83,200 gallons of water used each month.

\*Traditional cultivation methods call for using 21- 5 gallon pots inside of 3x8 foot tray.

## Wastewater Production

Again, as can be seen in the attached chart, potential wastewater creation posed by this project is minimal as compared to traditional cultivation techniques. Where a flood and drain method might create close to 400,000 gallons of wastewater, annually, the CHO method employed by Flora Terra will yield virtually zero wastewater<sup>4</sup>.



## REFERENCES

Jeff Okrepkie  
[Jeff@CoffeyStrong.com](mailto:Jeff@CoffeyStrong.com)  
707.235.7772

John Bly  
[Heynow7654@yahoo.com](mailto:Heynow7654@yahoo.com)

<sup>4</sup> Wastewater creation is calculated in the following way:

CHO Method: no wastewater created because the sugar-based nutrients are directly injected into the hose as each plant is hand watered; no water flush required for soil.

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Top Water using Traditional Methods: water and NPK-based nutrients are mixed in large vats. Approximately 25% of the water mixed ends up as waste water via runoff during watering because this method calls for excess water to flow through the pot, creating wastewater runoff.

Flood and Drain Method: using a flood and drain approach, reservoirs are filled with approximately 50 gallons of water. Each day the water circulates from the reservoir to the tray where the pots are. After one week, approximately 40% of the water remains which is discarded as waste.