

# Cannabis Cultivation and the Water Industry - Debunking Myths and Misconceptions



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1. **Water Consumption/wastewater generated in indoor growing**
2. **Constituents of Concern**
3. **Open Discussions...**

# Overview



**January 2016 Adopted Ordinance  
to allow cultivation  
in M-W  
(Wrecking Yard) zone (93 Acres)**



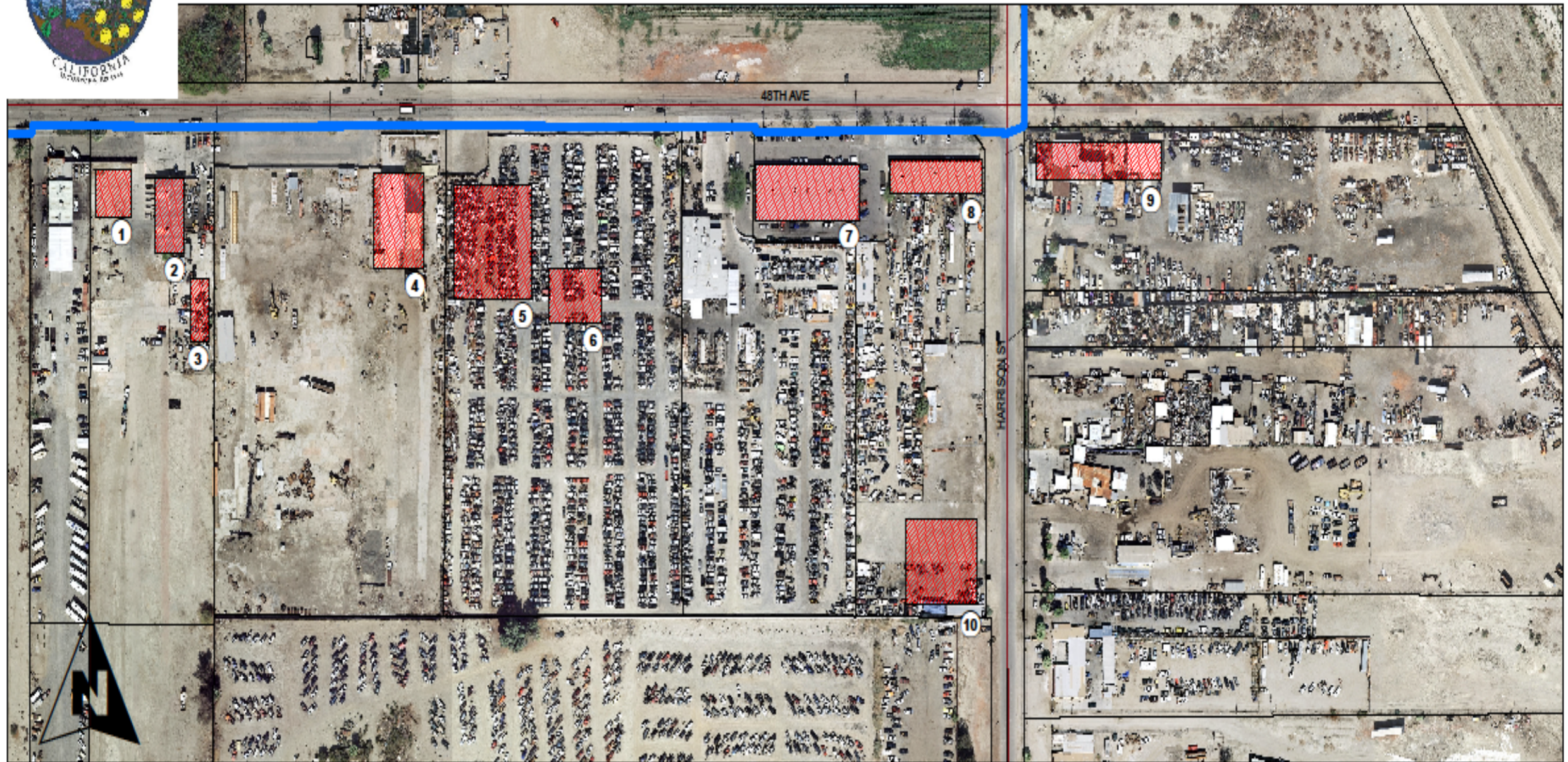
# Myths and Misconceptions



From Reefer Madness  
to Rational Data for  
Cannabis Cultivation



# COMMERCIAL CANNABIS - ACTIVE LICENSEES



(M) = MANUFACTURING

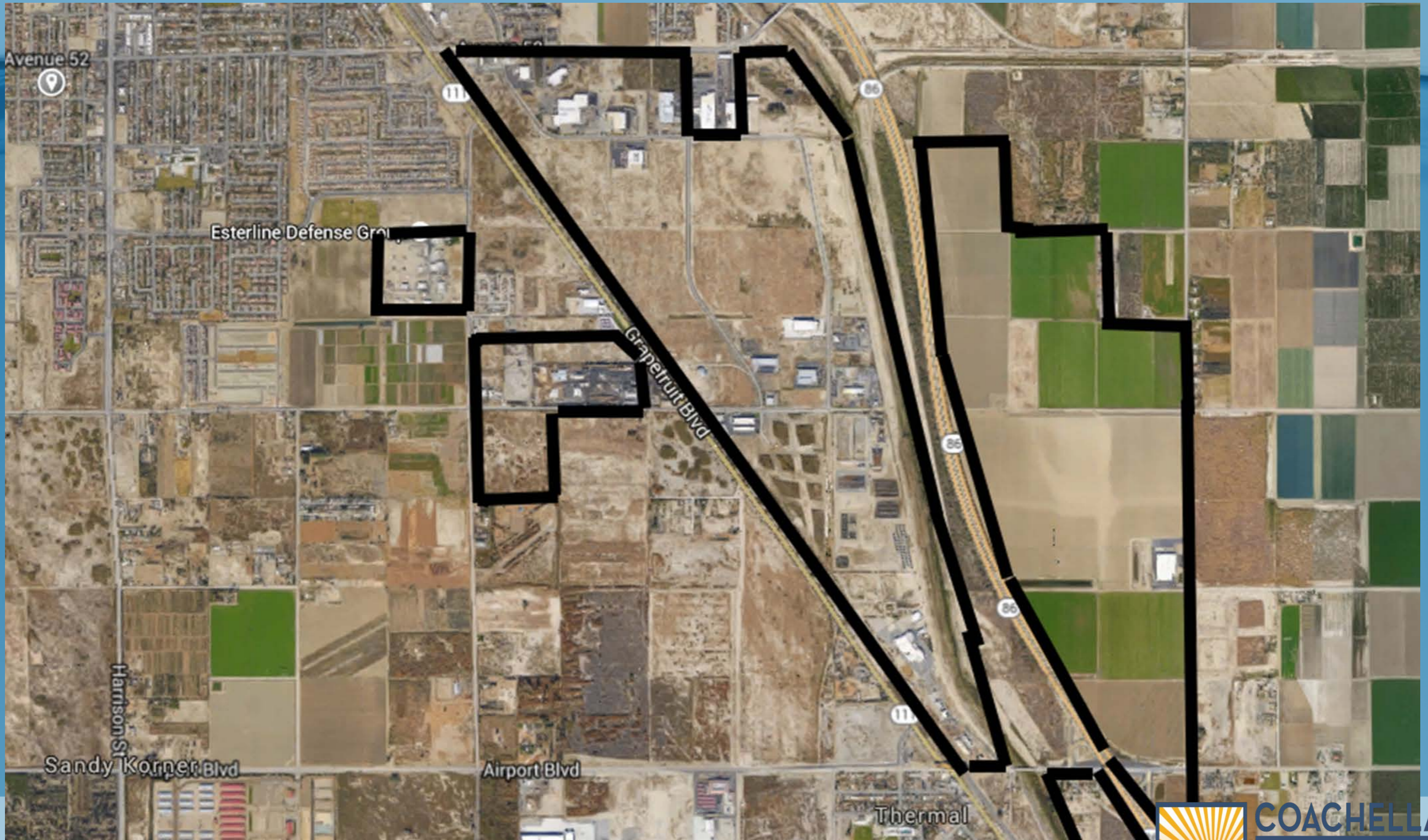
(D) = DISTRIBUTION

(P) = PROCESSING

(C) = CULTIVATION

(F) = FUTURE





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An architectural drawing of a building plan is shown on a white background. The drawing includes various rooms, corridors, and structural lines. A ruler is placed at the bottom left, and a black pen is at the top right. The text "Plan Check is a Must" is overlaid in the center in a bold, blue font. The drawing contains several numerical annotations: "7" near the top center, "580" in the middle left, "150" in the middle right, and "80" and "50" near the bottom center.

# Plan Check is a Must



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# SB 610

Requires all new development and large scale projects are required to conduct a water supply assessment before the project is approved.

In addition, all new construction must meet the California Green Building Code which requires all new development to feature water efficiency elements.

# “Will Serve Letter”

...“it is simply the first step in obtaining the necessary water (*and sewer*) usage for a project”.



# THE CREDIBLE HULK

"You won't like me when I'm angry. Because I always back up my rage with facts and documented sources."



# Cultivation Rooms



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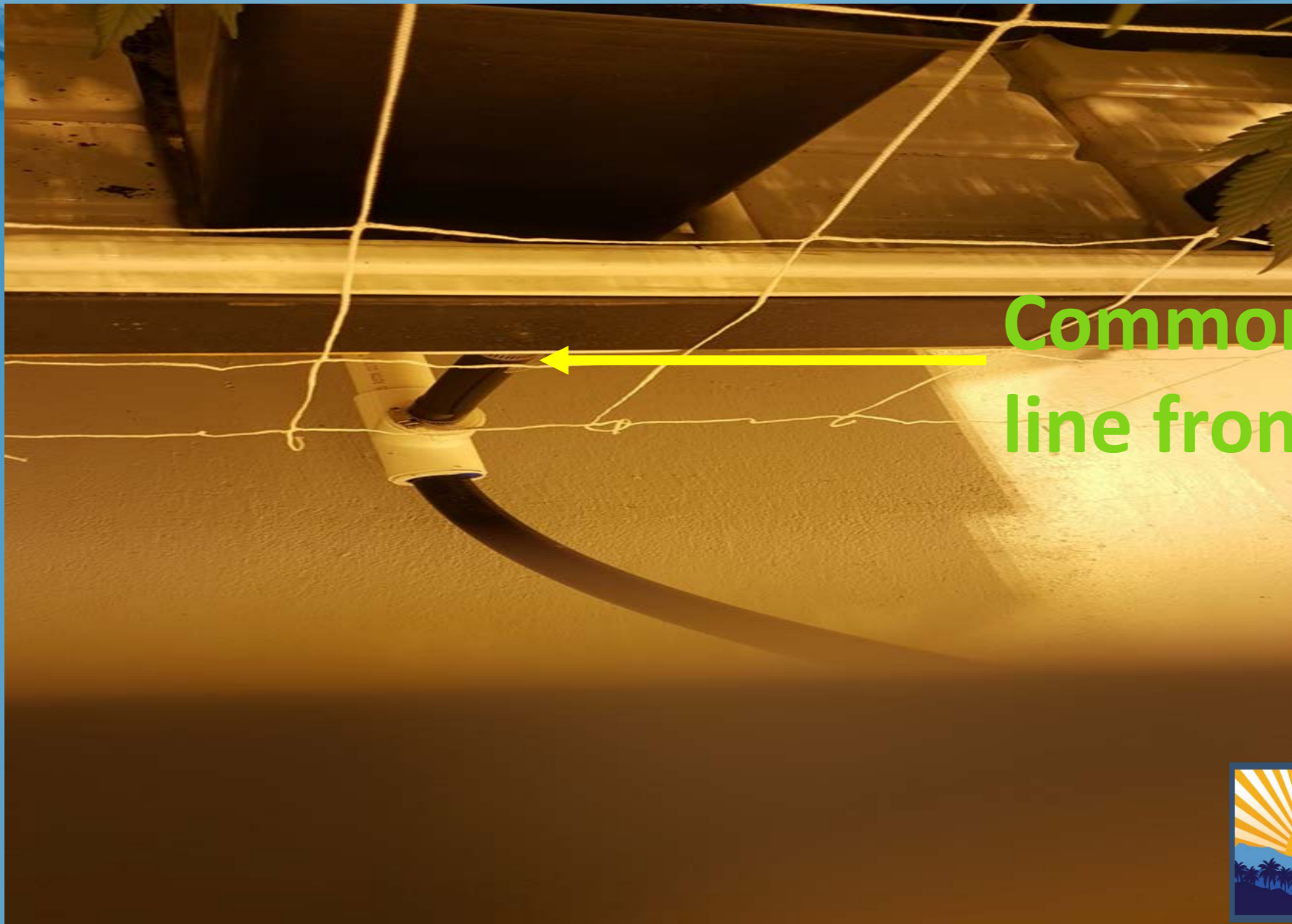
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# Cultivation Rooms



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Common Drain  
line from trays



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# Cultivation Rooms







# Reverse Osmosis Systems Used to treat water and to reuse in some instances



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# Nutrients



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# Water COUNTS ACADEMY

**CALI PRO® GROW A** Professional 2-Part Nutrient Series **EMERALD HARVEST**

Harness the genetic potential of your valuable crops with Emerald Harvest Cali Pro Grow A & B, our 2-part base nutrient engineered to fuel your garden during the vegetative phase. This tailor-made, nitrogen-rich formulation nourishes your high-yield crops with the essential elements they need for strong stalks and stems that will support a robust harvest.

Follow up Cali Pro Grow A & B with Cali Pro Bloom A & B during the flowering phase for guaranteed professional results.

Information regarding the contents and levels of metals in this product is available on the internet at <http://www.aapfco.org/metals.htm> F002274

**3-0-0 GUARANTEED ANALYSIS**

Total nitrogen (N)	3.0%
0.5% ammoniacal nitrogen	
2.0% nitrate nitrogen	
0.5% urea nitrogen	
Calcium (Ca)	2.0%
Boron (B)	0.02%
Cobalt (Co)	0.0005%
Copper (Cu)	0.005%
0.005% chelated copper (Cu)	
Iron (Fe)	0.1%
0.1% chelated iron (Fe)	
Manganese (Mn)	0.04%
0.04% chelated manganese (Mn)	
Molybdenum (Mo)	0.002%
Sodium (Na)	0.1%
Zinc (Zn)	0.02%
0.02% chelated zinc (Zn)	

**DIRECTIONS**  
mL of product per gallon of water

	GROW A	GROW B
Seedlings & cuttings	2 mL	2 mL
Early vegetative	4 mL	4 mL
Late vegetative	5 mL	5 mL

Attention—this is a 2-part base nutrient:  
- Do not premix concentrated nutrients.  
- Fill the reservoir with water and then add nutrients.  
- Monitor plants for signs of stress when following a more aggressive feeding program.  
Suitable for all plants grown hydroponically. Please refer to [www.emeraldharvest.co](http://www.emeraldharvest.co) for complete feeding programs.

**CAUTION:** This product contains molybdenum (Mo). Crops high in molybdenum can be toxic to ruminant animals. Use only according to manufacturer's directions.

**WARNING:** DO NOT SWALLOW. KEEP OUT OF REACH OF CHILDREN. SHAKE WELL BEFORE USING. STORE IN A COOL, DARK PLACE. PROTECT FROM FREEZING & DIRECT SUNLIGHT.

100% PRODUCT OF CALIFORNIA

210-023-102A-1001a

Visit [EMERALDHARVEST.CO](http://EMERALDHARVEST.CO) for details.

Manufactured by Emerald Harvest - 1399 Corporate Center Parkway, Santa Rosa, CA 95407 USA - Toll Free: 1.866.325.8235



**Advanced Nutrients Feeding Chart**

OR

**HUMBOLDT'S SECRET SUPPLIES FEEDING CHART**

(Bases) + (Additive) + (Maybe)



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# Common Nutrient Dosing Systems



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# Drip irrigation system



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# Most Grow Cycle Harvested ~ 10-14 weeks



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# Grow Cycle



# Grow Cycle



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# Grow Cycle



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# Harvest



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# Water Consumption history

Account #	Role	Name & Address	Last Billed	Last Payment	Status	Customer On Account	Deposits	Balance Due						
<b>Meter Reads</b>														
Meter #:	0023231880		(Continued)											
Date	Read 1	Read 2	Read 3	Total Cons	For Days	Cycle Start	Cycle End							
03/19/2019	57			16	28	03/01/2019	03/31/2019							
04/16/2019	73			16	28	04/01/2019	04/30/2019							
05/16/2019	92			0	0	05/01/2019	05/31/2019							
05/16/2019	92			19	30	05/01/2019	05/31/2019							
06/18/2019	124			32	33	06/01/2019	06/30/2019							
07/16/2019	154			30	28	07/01/2019	07/31/2019							
<b>Consumption</b>														
Use type: water														
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total	AVG
2019	11	17	16	16	19	32	30						141	20
2018									13	2	4	7	26	7
<b>Total</b>	<b>11</b>	<b>17</b>	<b>16</b>	<b>16</b>	<b>19</b>	<b>32</b>	<b>30</b>		<b>13</b>	<b>2</b>	<b>4</b>	<b>7</b>	<b>167</b>	<b>15</b>
<b>AVG</b>	<b>11</b>	<b>17</b>	<b>16</b>	<b>16</b>	<b>19</b>	<b>32</b>	<b>30</b>		<b>13</b>	<b>2</b>	<b>4</b>	<b>7</b>	<b>84</b>	
Totals :												200.00	3,028.57	



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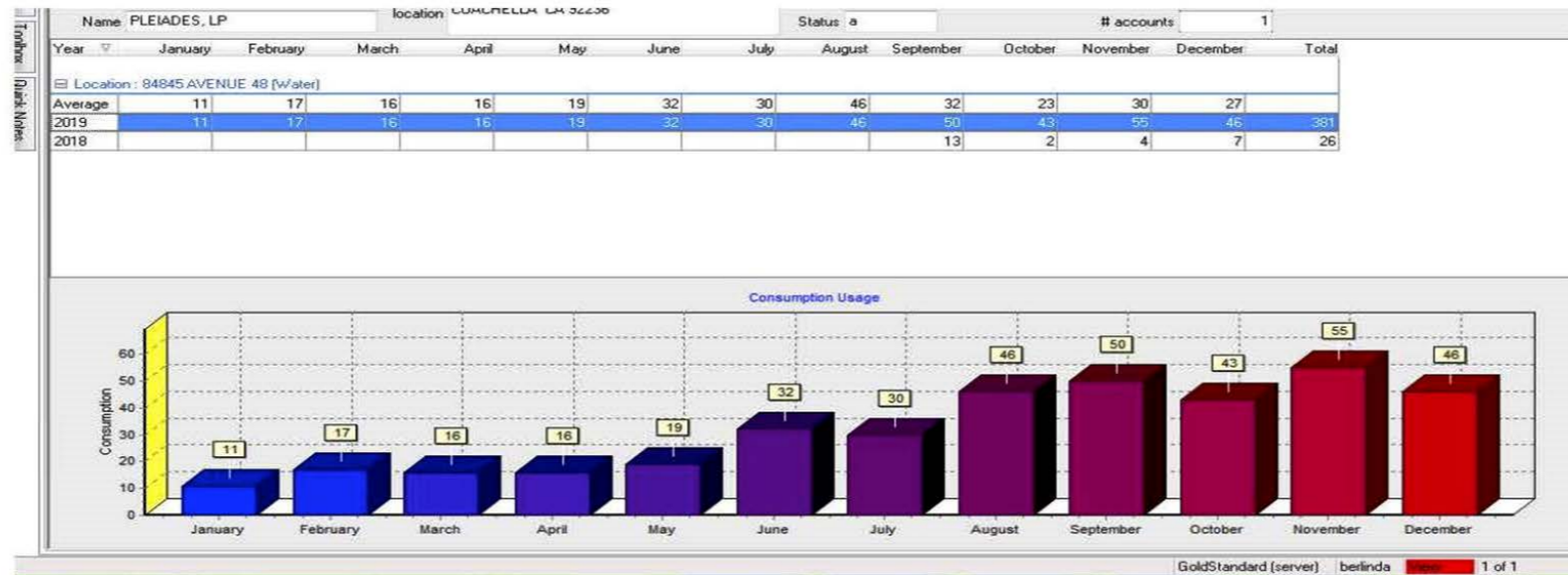
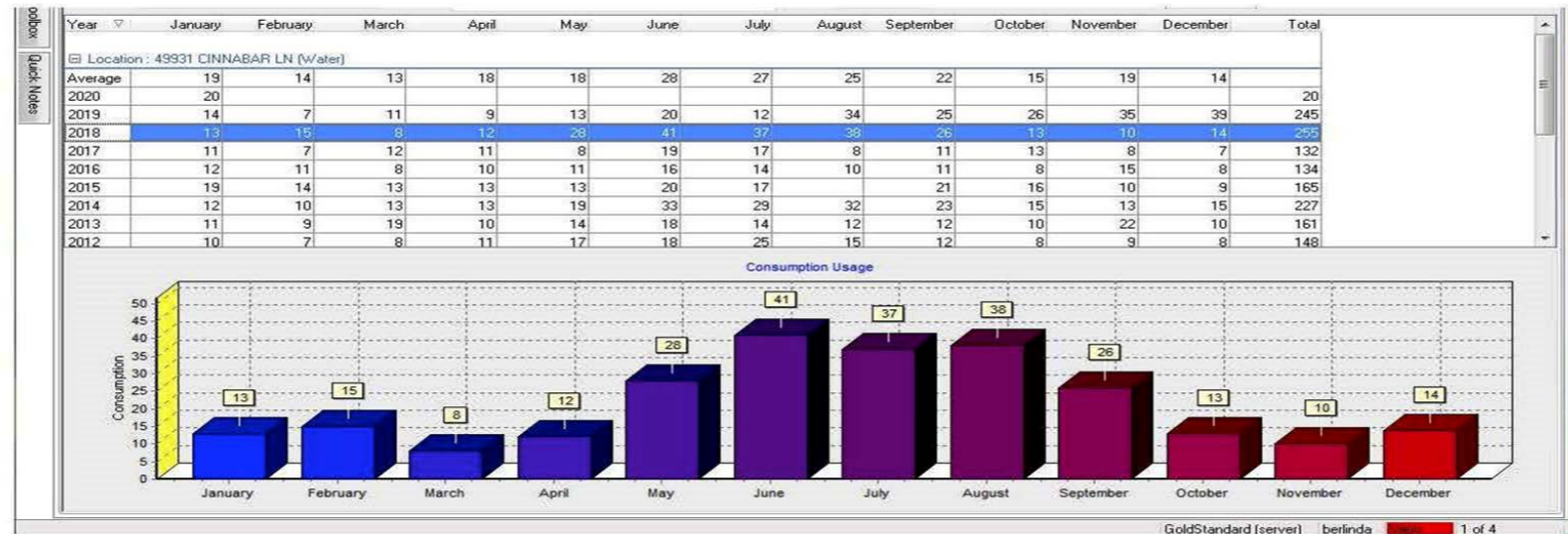


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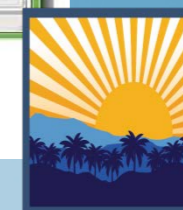


## Water Consumption

### 255 HCF Average Annual Residential Water Consumption



### 381 HCF Average Annual Cannabis Facility Water Consumption



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## PESTICIDES THAT **CANNOT** BE USED ON CANNABIS

The following are criteria for identifying pesticides that cannot be used in cannabis cultivation and examples of active ingredients meeting these criteria. This is a representative list of active ingredients and not intended to be exhaustive. The fact that an active ingredient is not listed does not authorize its use on cannabis in California.

### Pesticides Not Registered for Food Use in California

If a pesticide product does not have directions for use on a food crop, it cannot be used in cannabis cultivation. Examples of active ingredients that do not have food uses include:

- Aldicarb
- Carbofuran
- Chlordane
- Chlorfenapyr
- Coumaphos
- Daminozide
- DDVP (Dichlorvos)
- Etofenprox
- Fenoxycarb
- Imazalil
- Methyl parathion
- Mevinphos
- Paclobutrazol
- Propoxur
- Spiroxamine
- Thiacloprid

### California Restricted Materials

DPR designates certain pesticides as California restricted materials (3 CCR section 6400). A pesticide can be considered a restricted material for many reasons including designation as a federal Restricted Use Pesticide. Many of these products have product labels that clearly state "Restricted Use Pesticide." Consult your local CAC to determine whether a product is a restricted material. Examples of California restricted materials include:

- Abamectin
- Bifenthrin
- Brodifacoum
- Bromdiolone
- Cyfluthrin
- Difenacoum
- Difethialone
- Fipronil
- Naled

### Pesticides on the Groundwater Protection List

Active ingredients that are on the Groundwater Protection List (3CCR section 6800) have chemical characteristics that make them likely to move into groundwater. Examples of active ingredients on the groundwater protection list include:

- Acephate
- Azoxystrobin
- Boscalid
- Carbaryl
- Chlorantraniliprole
- Diazinon
- Dimethoate
- Dimethomorph
- Ethoprop(hos)
- Fludioxonil
- Imidacloprid
- Malathion
- Metalaxyl
- Methiocarb
- Methomyl
- Myclobutanil
- Propiconazole
- Tebuconazole
- Thiamethoxam

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## PESTICIDES THAT ARE LEGAL TO USE ON CANNABIS

The following are examples of pesticide active ingredients that are exempt from tolerance requirements and either exempt from registration requirements or have labels broad enough to include use on cannabis. This is not an exhaustive list of active ingredients that may fit the legal use criteria. The active ingredients are organized by the intended target.

### Insecticides and Miticides

- Azadirachtin
- *Bacillus thuringiensis* sub. *kurstaki*
- *Bacillus thuringiensis* sub. *israelensis*
- *Beauveria bassiana*
- *Burkholderia* spp. strain A396
- Capsaicin
- Cinnamon and cinnamon oil
- Citric acid
- Garlic and garlic oil
- Geraniol
- Horticultural oils (petroleum oil)
- Insecticidal soaps (potassium salts of fatty acids)
- Iron phosphate
- *Isaria fumosorosea*
- Neem oil
- Potassium bicarbonate
- Potassium sorbate
- Rosemary oil
- Sesame and sesame oil
- Sodium bicarbonate
- Soybean oil
- Sulfur
- Thyme oil

### Fungicides and Antimicrobials

- *Bacillus amyloliquefaciens* strain D747
- Cloves and clove oil
- Corn oil
- Cottonseed oil
- *Gliocladium virens*
- Neem oil
- Peppermint and peppermint oil
- Potassium bicarbonate
- Potassium silicate
- Rosemary and rosemary oil
- Sodium bicarbonate
- Reynoutria sachalinensis extract
- Trichoderma harzianum

### Vertebrate Repellants

- Castor oil
- Geraniol

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# Constituents of Concern

- Nitrogen
- Phosphorus
- Potassium
- Sodium
- Calcium
- Magnesium
- Sulfate/SO4
- pH
- EC
- TDS
- TSS
- Zinc
- Iron
- Manganese
- Molybdenum
- Colbalt
- Chlorine
- Silica(SiO2)
- Boron
- Copper
- Nitrate
- Ammonia N



# Lab Data (mg/L)

• Nitrogen	30	• Zinc	0.35
• Phosphorus	38	• Iron	1.0
• Potassium	140	• Manganese	0.11
• Sodium	54	• Molybdenum	0.0097
• Calcium	48	• Chlorine	0.35
• Magnesium	18	• <b>Silica(SiO2)</b>	<b>53.0</b>
• Sulfate/SO4	85	• Boron	0.18
• pH	6.7	• Copper	0.074
• <b>EC</b>	<b>910</b>	• Nitrate	33.0
• <b>TDS</b>	<b>820</b>	• Ammonia(N)	2.5
• TSS	39.0		







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# Thank You

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