SHASTA LABS, INC.
CANNABIS TESTING LABORATORY

PROJECT DESCRIPTION

Introduction

Shasta Laboratory, Inc. is seeking a Conditional Use Permit for the operation of a Cannabis Testing Laboratory to be located in its leased space at 2974 Teagarden Street, San Leandro, CA 94577. The site is favorably situated in an industrial area, consistent with its use in Zoning District: IG, Industrial General, and proximate to all proper infrastructure. The location is very industrial, and is distant and isolated from all residential, educational, childcare, recreational, and community areas, as well as other sensitive land use locations. The site is separated from all such uses by major roadways, creating a natural barrier. Based on studies conducted by the company and accompanying this application, the facility's operation will not generate significant noise or traffic impacts on the city or its residents. The company will apply for the California state Testing Laboratory Type 8 permit under the Bureau of Cannabis Control Proposed Text of Regulations as of October 2018, after receiving the documentation of local authorization.

Company

Shasta Laboratory, Inc. ("Shasta Laboratory") is a California Corporation, incorporated July 2018 with California Registration No. C4175125 and Federal EIN 83-1344024. Shasta Laboratory is a sister company of both Advanced Spectro Technologies, Inc. ("AST"), a company specializing in biotech instruments located at 2333 Verna Court, San Leandro CA 94577, and ShastaBio, Inc., a California corporation ("ShastaBio"), both of which specialize in non-cannabis chemical testing for the biotech, pharmaceutical and medical industries as described below. Both AST and ShastaBio are under majority common ownership with Shasta Laboratory.

AST is a service and technical support providing company in biotech industry. AST was founded on mass spectrometer engineering and analytical chemistry in 2007, and has provided service contract, customer training and application support to many biotech and pharmaceutical companies in San Francisco Bay area since then.

ShastaBio is a contract research organization (CRO) company that provides support to the pharmaceutical, biotechnology, and medical device industries in the form of research services outsourced on a contract basis.

Based on the scientific expertise of ShastaBio and AST, Shasta Laboratory was founded to bring complete and comprehensive scientifically validated testing of cannabis products to the California market. The unique and specialized experience of the ShastaBio and AST companies brings immediate and unique expertise in both the bio-analytical and bio-engineering field to Shasta Laboratory and its potential customers. The mission of Shasta Laboratory is to leverage the expertise and experience of the personnel of AST and ShastaBio into the cannabis testing industry, which is in great need of real scientific expertise.

AST and ShastaBio have been in biotech industry over 10 years in Bay Area, and have been providing critical scientific services to major biotech, pharmaceutical companies and institutions such as Genentech, Cytokinetics, Rigel, UC Berkeley, UC Davis, UC San Francisco, US Department of Agriculture, and other major research and biotech/medical companies and institutions. Our companies' collective experience in biotech and pharmaceutical matters, many of which are regulated by FDA and other governmental agencies, will easily meet or exceed the California BCC (Bureau of Cannabis Control) quality control and regulation. Based on this expertise and experience, Shasta Laboratory will bring accurate, safe and highly quality controlled service to California's new cannabis testing industry.

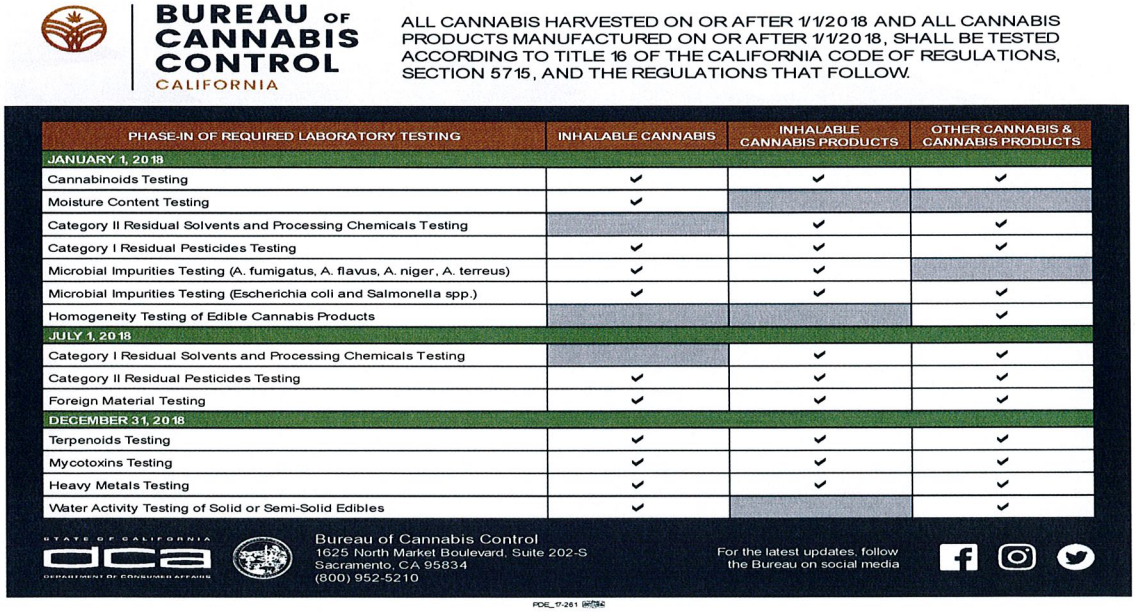
Lab Testing Services

Shasta Labs will provide the following laboratory testing services to cannabis products cultivators, distributors, manufacturers and dispensaries as required by the Bureau of Cannabis Control:

1. Cannabinoids
2. Foreign material
3. Heavy metals
4. Microbial impurities
5. Mycotoxins
6. Moisture content and water activity
7. Residual pesticides
8. Residual solvents and processing chemicals
9. Terpenoids

Shasta Labs also expects to secure ISO/IEC 17025 accreditation for its testing laboratory within one (1) year from the grant of its license.

Figure 1, BCC



BUREAU OF CANNABIS CONTROL
CALIFORNIA

ALL CANNABIS HARVESTED ON OR AFTER 1/1/2018 AND ALL CANNABIS PRODUCTS MANUFACTURED ON OR AFTER 1/1/2018, SHALL BE TESTED ACCORDING TO TITLE 16 OF THE CALIFORNIA CODE OF REGULATIONS, SECTION 5715, AND THE REGULATIONS THAT FOLLOW.

PHASE-IN OF REQUIRED LABORATORY TESTING	INHALABLE CANNABIS	INHALABLE CANNABIS PRODUCTS	OTHER CANNABIS & CANNABIS PRODUCTS
JANUARY 1, 2018			
Cannabinoids Testing	✔	✔	✔
Moisture Content Testing	✔		
Category II Residual Solvents and Processing Chemicals Testing		✔	✔
Category I Residual Pesticides Testing	✔	✔	✔
Microbial Impurities Testing (A. fumigatus, A. flavus, A. niger, A. terreus)	✔	✔	
Microbial Impurities Testing (Escherichia coli and Salmonella spp.)	✔	✔	✔
Homogeneity Testing of Edible Cannabis Products			✔
JULY 1, 2018			
Category I Residual Solvents and Processing Chemicals Testing		✔	✔
Category II Residual Pesticides Testing	✔	✔	✔
Foreign Material Testing	✔	✔	✔
DECEMBER 31, 2018			
Terpenoids Testing	✔	✔	✔
Mycotoxins Testing	✔	✔	✔
Heavy Metals Testing	✔	✔	✔
Water Activity Testing of Solid or Semi-Solid Edibles	✔		✔

STATE OF CALIFORNIA
dca
DEPARTMENT OF CONSUMER AFFAIRS

Bureau of Cannabis Control
1625 North Market Boulevard, Suite 202-S
Sacramento, CA 95834
(800) 952-5210

For the latest updates, follow the Bureau on social media

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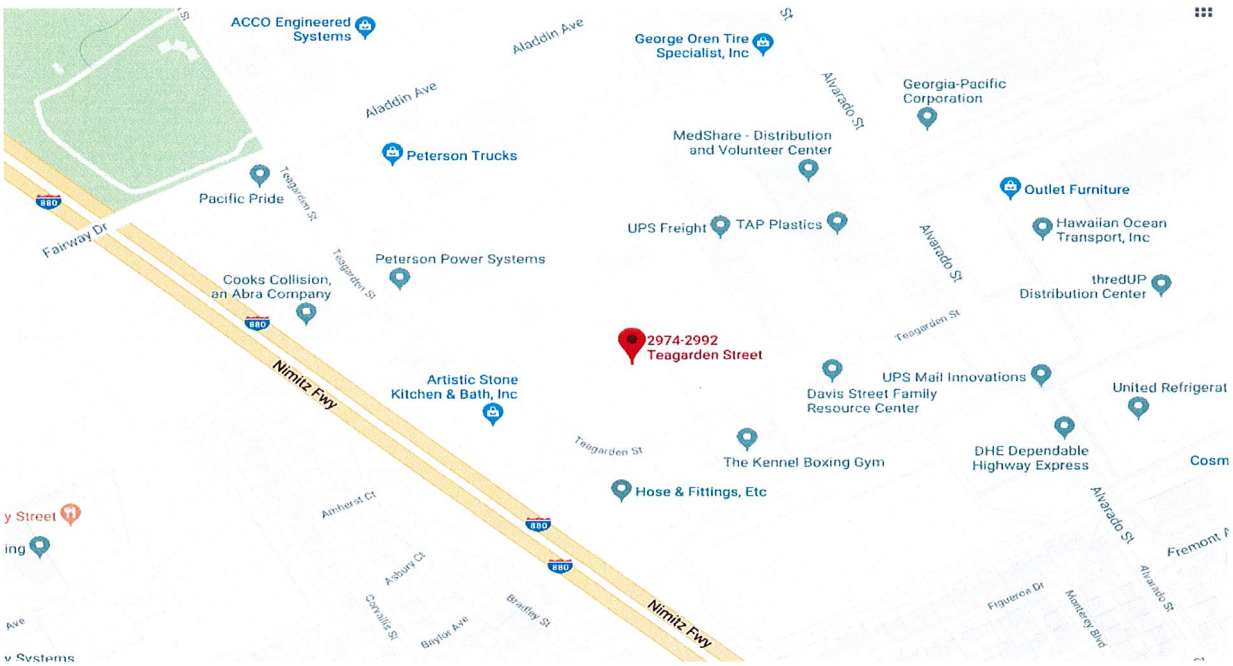
TESTING LABORATORY SITE

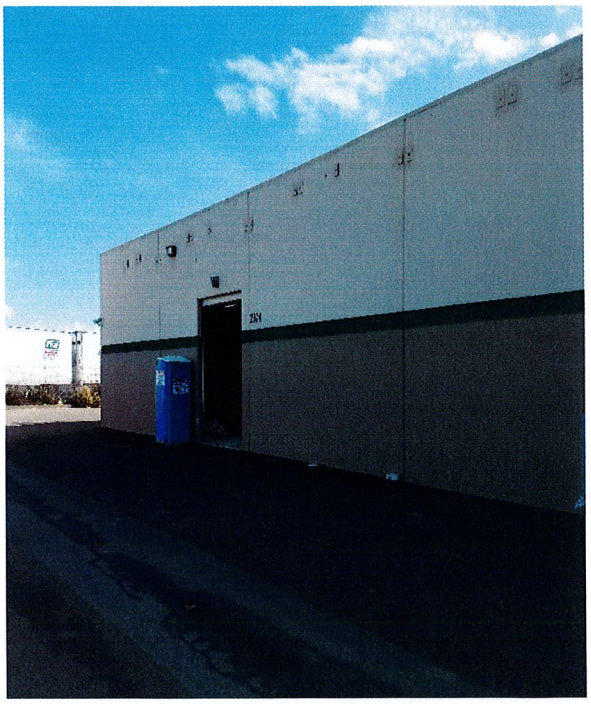
The chosen site is located in 2974 Teagarden Street in San Leandro, which is an area where a cannabis testing laboratory is allowed under city ordinances.

Figure 2, location



Building Pictures

Front side, Main entrance



Back side of building

Parking Lot

1. Yellow dot parking spaces are reserved for the 2974 Teagarden's visitors.
2. Out lined red color parking space is for 2974 Teagarden.

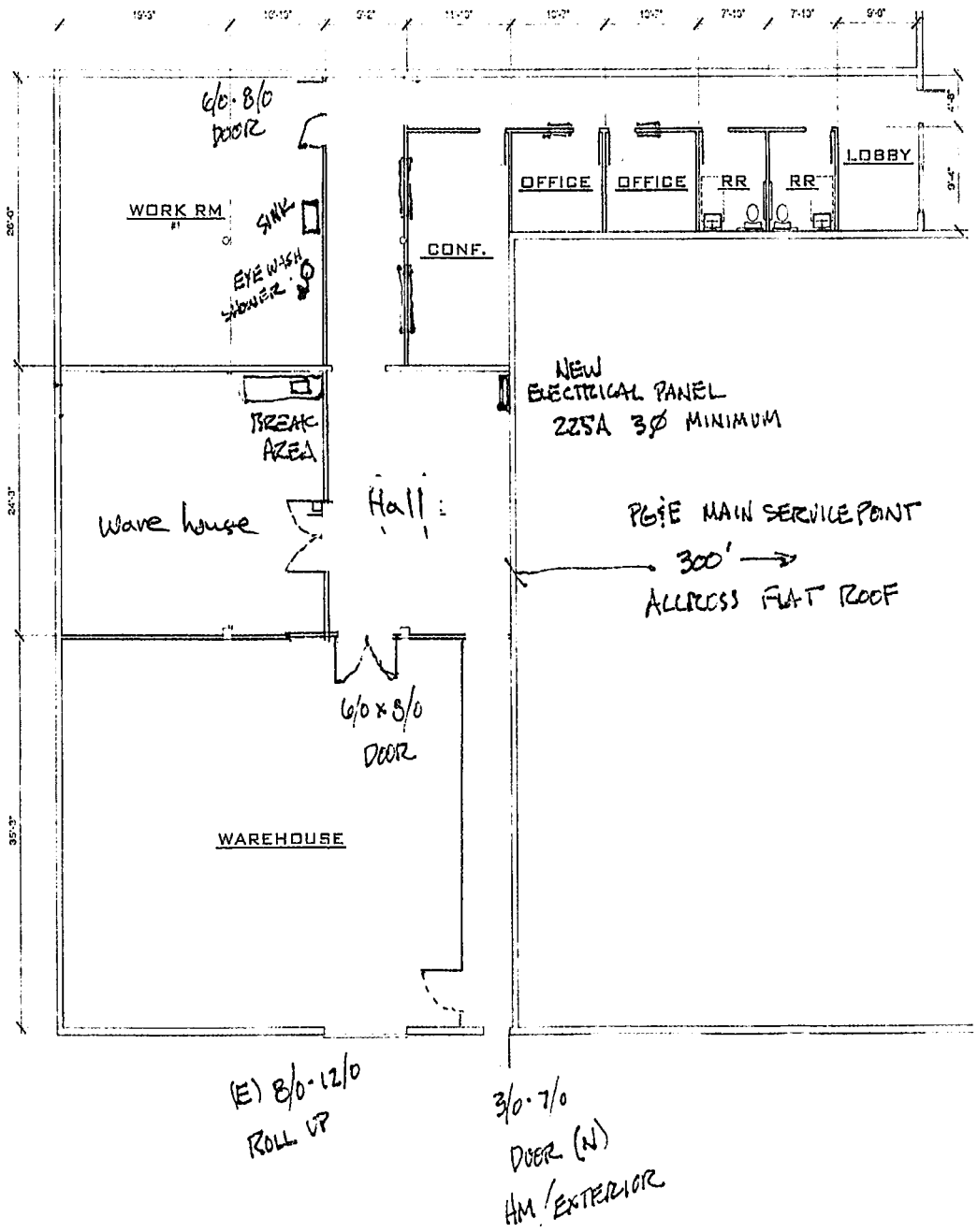
The space is more than ample for the proposed operation, with premises of approximately 5,400 square feet. The operation will initially need about 2,000 square feet with 200 amps 3-phase power for the testing lab operation.

The company does not expect any traffic increase on this site due to the nature of the testing business. Cannabis testing samples will be delivered to the facility by properly trained persons with a valid transportation license under BCC regulations. The company expects to exclusively contract with third party licensed transportation companies for sampling and transportation to ensure safety and compliance with applicable regulations. The company will not accept any testing samples from non-licensed entities.

The company has designated two parking spots for visitors; in addition there are multiple parking spaces behind the building in the parking lot. Please refer the preliminary layout of the site, Figure 3.

Preliminary Layout of the site
2974 Teagarden Street, San Leandro Ca 94577

Figure 3, site



OPERATING PLAN

Premises

The laboratory will include separate rooms, each of which are partitioned for the following activities:

1. Sample receiving area near the front door.
2. Sample storage before analysis will be in the locked reagent cabinet in secured room. Refer to Figure 3.
3. Sample preparation and recording will be in the secured laboratory room. Refer to Figure 3.
4. Microbiology analysis. In secured laboratory room. Refer to Figure 3.
5. Chemistry analysis. In secured laboratory room. Refer to figure 3.
6. Office space will be separate from secured analysis area. Refer to Figure 3.

Office Hours

The laboratory will be open from 9AM – 6PM Monday to Friday.

Expected Customers

We expect 5 or fewer contracted customers per day coming into the lab during open hours. Shasta Laboratory does not expect to accept "walk in" samples.

Employees

We expect the lab to have five full time employees, as follows:

1. Lab Director – 1 person
2. Lab Manager - 1 person
3. Analytical chemists – 2 persons
4. Samplers – none, we expect to use a third party service for this function
5. Office Manager – 1 person

Testing Standards and Chemicals

Appropriate testing is critical to demonstrate that these products do not contain harmful levels of contaminants or adulterants and are safe for public consumption. The company will conduct those tests under the supervision of the Bureau of Cannabis Control.

Shasta Laboratory will have chemicals required for the testing process. All chemicals will be stored in compliance with all federal, state and local regulations. Chemicals will be stored and used properly, in reagent cabinets and a minus-80 degree Celsius freezer. The company expects to carry the minimum volume of such chemicals, probably approximately 4 liters of organic solvents required for the testing process, such as MeOH (Methanol) and ACN (Acetonitrile). All such solvents will be stored inside of flammable storage cabinets as depicted in Figure 4.

Figure 4, Chemical storage

Flammable Chemical Storage Cabinets

-80C freezer

Enclosed Chemical Reagent Cabinet

The chemicals to be used for testing are designed to test for the following per BCC regulations:

1. Cannabinoids
2. Foreign material
3. Heavy metals
4. Microbial impurities
5. Mycotoxins
6. Moisture content and water activity
7. Residual pesticides
8. Residual solvents and processing chemicals
9. Terpenoids

Per the applicable BCC regulations, a cultivation facility or dispensary must employ a laboratory for testing, and must provide such laboratory, prior to a laboratory taking samples, with the following:

1. A written request of analysis for each test the laboratory is being requested to conduct
2. Notification of whether the batch is being re-sampled because of a failed test and the failed test results.

A cultivation facility or dispensary must test every batch of usable marijuana, intended for use by a qualified patient, prior to selling or transferring the usable marijuana for the following:

a) Pesticides.
b) Water activity and moisture content, unless the cultivation facility or dispensary uses a method of processing that results in effective sterilization
c) THC and CBD concentration.
d) Heavy Metals.
e) Microbiological contaminants.

A cultivation facility or dispensary must test every processed lot of cannabinoid concentrate or extract for use by a qualified patient prior to selling or transferring the cannabinoid concentrate or extract for the following:

a) Pesticides.
b) Solvents, unless they did not use any solvent, only used a mechanical extraction process to separate cannabinoids from the marijuana or used only water, animal fat or vegetable oil as a solvent to separate the cannabinoids from the marijuana.
c) THC and CBD concentration.
d) Heavy Metals.
e) Microbiological contaminants.

Testing Method

Shasta laboratory expects to use multiple API-4000 HPLC/MS (HPLC, High Performance Liquid Chromatography and MS, Mass Spectrometry) technology to determine the original composition of cannabinoids present by direct analysis of plant and edible samples. This technique uniquely determines all of the medicinal components contained within the products and provides a cannabinoid profile in order to more accurately evaluate potency, institute material quality assurance and to identify plant phenotype. The company will also utilize GC/MS (Gas chromatography / Mass spectrometry) for pesticides and residual solvent tests used in cannabis processing. In addition, ICP-MS, (inductively-coupled plasma mass spectrometry) is a key instrument in testing for heavy metal contaminants such as lead, mercury, cadmium and arsenic, sometimes found in cannabis samples.

Testing Equipment

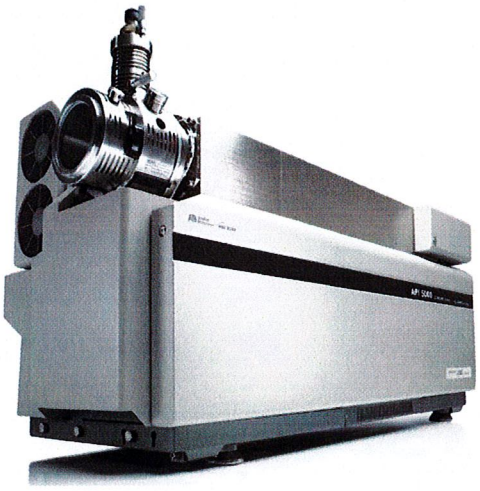
Equipment to be used in testing includes:

1. Liquid Chromatography with Mass Spectrometry. (ESI, APCI LC/MS)
2. Gas Chromatography with Mass Spectrometry (GC/MS)
3. High Performance Liquid Chromatography (HPLC)
4. Inductively coupled plasma with Mass Spectrometry (ICP/MS)
5. Homogenizer
6. UV/VIS (Ultraviolet detector).
7. Water activity analyzer

Please refer Figure 5 for details.

Figure 5, example

Mass Spectrometry. (ESI, APCI)



HPLC

Gas Chromatography

ICP/MS

Homogenizer

Samples
Sample size as required by BCC are shown below. Entire samples will be consumed by testing, typically within 24 hours of receipt.

Product	Tests Required	Sample Size Needed to Complete all Tests
Usable marijuana.	1. Moisture content 2. Cannabinoid analysis 3. Terpene analysis 4. Foreign matter inspection 5. Microbial screening 6. Mycotoxin screening 7. Heavy metal screening 8. Pesticide residue analysis	Up to 12 grams
Extract of marijuana (non-solvent) like kief, hashish, bubble hash, infused dairy butter, or oils or fats derived from natural sources, includes CO2	1. Cannabinoid analysis 2. Foreign matter inspection 3. Microbial screening 4. Terpene analysis	7 grams or less
Extract of marijuana (solvent-based) made using n-butane, isobutane, propane, heptane, or other solvents or gases of at least 99% purity approved by the NV DPBH, including food grade ethanol	1. Cannabinoid analysis 2. Terpene analysis 2. Foreign matter inspection 3. Microbial screening 4. Residual solvent test	2 grams or less
Edible marijuana-infused product	1. Cannabinoid analysis 2. Terpene analysis 3. Microbial screening	1% of batch
Liquid marijuana-infused product, including, without limitation, soda or tonic	1. Cannabinoid analysis 2. Terpene analysis 3. Microbial screening	1 unit
Topical marijuana-infused product	1. Cannabinoid analysis 2. Terpene analysis	1 unit

The laboratory will keep controlled records of the sampling plans and results at the laboratory, and the sampling plans will be available to laboratory personnel. The laboratory will make the sampling plans available for inspection by all regulatory entities immediately upon request.

Sample Handling

The laboratory expects to require customers to provide delivery service of all samples. Laboratory personnel handling samples will wear the following items during the entire sampling process:

(a) Disposable protective coveralls or disposable lab coat or apron
(b) Disposable nitrile gloves
(c) Filtering dust mask
(d) Safety goggles
(e) Hair net

The sampler will be required to change gloves between sampling different batches.

SECURITY/SAFETY

During regular business hours, the premises will be accessible on request to any properly identified governmental inspector. The company has developed and will implement security protocols to prevent theft and loss of cannabis samples. The security protocol will be documented in writing and implemented by all laboratory personnel.

Premises Access

1. All external doors and gates will be secured by commercial locks rated to ANSI grade 1 or similar standards and materials will be available on-site for inspection to verify the security rating.
2. During non-operating hours, all cannabis samples will be stored indoors on the premises in a secure area with all entries secured with a steel door in a steel frame (or equivalent) and commercial-grade locks.
3. All samples will be entirely used in the testing within 24 hours of receipt, and there will be no remaining cannabis samples after each sample's testing.
4. Outside of business operating hours, all exterior doors, windows, or other points of ingress/egress will be locked.

Premises Alarm & Monitoring

1. The premises will have an alarm system programmed to activate upon unauthorized breach of any door, window, or other point of entry.
2. The alarm system will be capable of detecting unauthorized access to any portion of the premises.
3. The alarm system will provide immediate notification to an authorized representative of the company in the event of any unauthorized entry to any portion of the premises.
4. The alarm system will provide a mechanism to contact law enforcement by at least one of the following methods:
    a. At least two "panic buttons" will be installed on the premises that can trigger the alarm system and immediately notify a security company or law enforcement.
    b. Mobile "panic buttons" will be carried by all licensed representatives on the premises that can trigger the alarm system and immediately notify a security company or law enforcement.
    c. An operational landline telephone will be present at all times within the limited access area that is capable of contacting security or law enforcement.

Video Surveillance

1. The premises will be equipped with a video surveillance system.
2. Cameras will cover all areas where any cannabis items (including plants and waste) are present at any time, including pathways where product will be moved, without any "blind spots."
3. Cameras will cover all areas within 15 feet of all points of entry/exit from the licensed premises in all directions.
4. All cameras will record continuously 24 hours a day at a resolution of 1280 x 720 pixels or better in all lighting conditions.
5. All cameras will cover areas where marijuana items will be present and all cameras covering the surveillance area will record at a minimum of 10 frames per second.
6. All cameras will cover exterior non-limited access areas record at a minimum of 5 frames per second.
7. The surveillance room will contain a list of personnel authorized to access the surveillance system and will be password protected.
8. The company will keep a log of all maintenance activity for the surveillance equipment including name of the individual, date and time of access, and reason for access.
9. The surveillance system will include a monitor capable of viewing video from any camera, a digital archiving device, and a printer.
10. The surveillance system will have a backup battery that will provide at least one hour of continuous recording in event of any power failure.
11. An authorized representative will receive immediate notification within one hour of the failure of any security camera or portion of the surveillance system.
12. All required recordings, including the backups of the surveillance area recordings kept for 90 days with a method to store video longer than 90 days if requested.
13. Details for the security camera.
    a. Integrated with commercial security company system with real time footage access
    b. Access through smart phone application along with alert notification. We will have cameras at the following locations within the office:
        i. One camera facing entrance
        ii. Multiple cameras covering testing operation and pathway from storage area to same
        iii. One camera facing conference room
        iv. Two cameras covering back side of building
        v. Two Cameras covering front ways and emergency exit door
        vi. One camera facing to breakroom area

Prevention of burglary or armed robbery

All employees will be required to follow security measures. Below is each measure to protect the laboratory and samples from burglary or armed robbery:

1. The company will not advertise its address on any public profiles, or platforms, and no signage will indicate any cannabis involvement.
2. The company will require all employees to have verified identification to access the facility, and all will be subject to background checks.

3. The company will not allow any unscheduled product pick-up or sample exchange at the office to prevent any unnecessary traffic to our office.
4. The company's security program will be active 24/7 in case of any emergencies.

ODOR MITIGATION

The company will have odor control devices and techniques including sufficient odor absorbing ventilation, an exhaust filtration system and a negative air pressure system so the odor generated inside the facility that is distinctive to its operation is not detected outside of the facility, anywhere on adjacent property or public rights of way, on or about the exterior or common area walkways, hallways, breezeways, foyer, lobby areas, or any other areas available for use by the visiting public, or within any other unit located near by the building as the cannabis testing lab business. The following construction and filtration systems shall be implemented:

1. The company will have two separate HVAC systems, including a separate system for internal filtration of the office area.
2. The laboratory room and storage area will also have a separate individual HVAC system with internal carbon filtration systems, which will be set to activate on a timed schedule in order to maximize internal air purification.
3. The laboratory room will have a chemical fume hood for all activities.
4. A functional air vent in laboratory and storage room will be equipped with systems that feature recirculation ports fitted with carbon filters and high efficiency particulate air filters in order to prevent odors from being released from the HVAC system as air circulates in the laboratory room and storage.

Deodorizing Process

1. The company will strictly prohibit sample opening except in controlled areas. Samples will be opened only in the laboratory and storage room.
2. The laboratory room and storage entrance doors will be kept closed at all times.
3. Carbon filters for laboratory areas will have 1050+ IAV Australian charcoal which is the most absorbent carbon available. The Carbon filter itself is the generally accepted best practice for smell-proofing cannabis.
4. The laboratory room fan will run 24/7, creating negative pressure and preventing any odor leak from the laboratory room.

Storage Areas

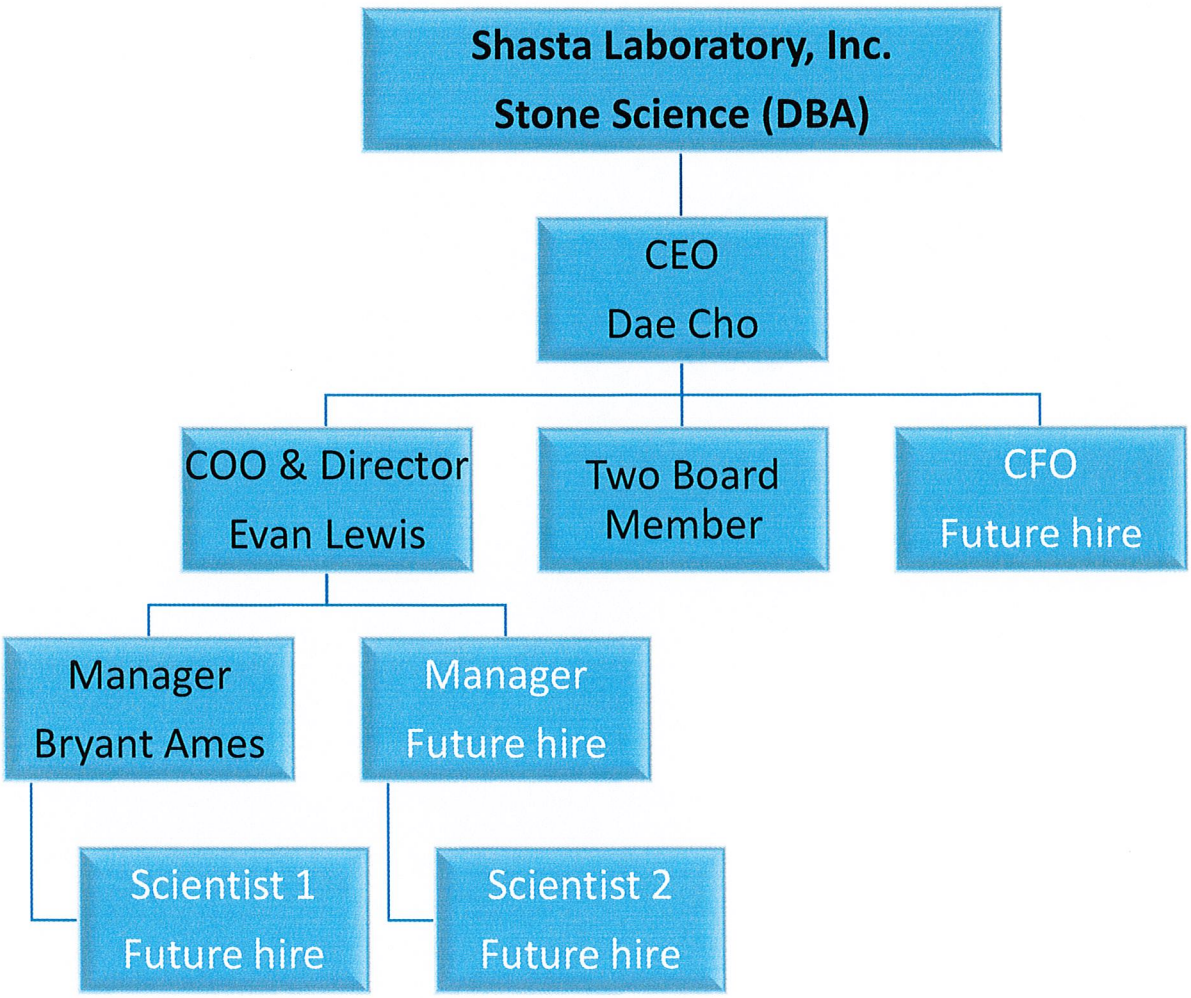
1. The laboratory will store cannabis samples secured with a commercial-grade lock in a room or cabinet capable of preventing diversion, theft, and loss.
2. Secured areas will be locked at all times except when managing or retrieving a secured item or items.
3. Secured areas will be designated for storage of the following
    a. Test samples of cannabis goods
    b. Waste containing cannabis;

c. Reference standards for analysis of cannabinoids, refer to Figure 4.
d. Any controlled substances related to cannabinoids, refer to Figure 4.
e. Records of analytical tests, including certificates of analyses and data packages, refer to Figure 3.

Electronic Data

1. Company will store all raw unprocessed instrument output data files and processed quantitation output files at the laboratory on some form of electronic, magnetic, or optical media. The laboratory will allow access to these records for inspection and audit.
2. Company will install, manage, and maintain password-protection for electronically stored data, including the data listed above.

MANAGEMENT



Daeseob Cho, Founder and CEO of Shasta Laboratory
Mr. Cho has an MS in Organic Chemistry with over 20 years of industrial experience in the pharmaceutical and biotech fields. He will conduct the management of the company. Over the past 8 years, Mr. Cho aggressively increased AST's client engagement in the biotech and pharmaceutical industries, and developed several unique projects in mass spectrometer technologies and chemistry analysis. He has also collaborated with USDA, ISB and other institution for the Nano LC/MS analytical development in proteomics. He is also the founder and CEO of ShastaBio, Inc., CRO Company founded in 2015 to assist the biotech and pharmaceutical industry. Mr. Cho was previously employed by Applied Biosystems as a senior engineer and technical center member in its mass spectrometer business unit. Previously, he worked at Cytokinetics, ChemRx, and Axys Pharmaceutical.

Evan Lewis, COO and Director of Shasta Laboratory
Mr. Lewis has a Ph.D. in Analytical Chemistry with over 25 years industrial experience in the pharmaceutical and biotech field. Mr. Lewis will play a key role in the company's analytical services. He is an expert in biochemical analysis and has extensive experience in good manufacturing practices (GMP) for drug products and active pharmaceutical products.

Bryant Ames, Lab Manager
Mr. Ames has an MS in Analytical Chemistry, with over 10 years of industrial experience in the pharmaceutical and biotech fields. He will be in charge of daily operation of the laboratory and will assure the quality of the laboratory protocol and operations.

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