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COMMERCIAL BUILDING PERMIT APPLICATION			
HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES, AND PERMITS DIVISION			
3430 COURT HOUSE DRIVE, ELLICOTT CITY, MD 21043 - PHONE: (410) 313-2455 OPTION #4			
www.howardcountymd.gov			
BUILDING SITE ADDRESS REQUIRED			
Street Address: 7221 Montevideo Road			Unit: 200
City: Jessup		State: MD	Zip Code: 20794
Subdivision/Village/Complex Name:			SDP/WP/BA #: 12-060
Lot:	Tax Map:	Parcel:	Grading Permit #:
DESCRIPTION OF WORK REQUIRED			
Existing Use: Ethanol Extraction		Proposed Use: Butane Extraction	
Estimated Cost: \$250,000			
Trade Work to Be Completed (Separate Permits Required): <input checked="" type="checkbox"/> Mechanical (HVACR) <input checked="" type="checkbox"/> Electrical <input type="checkbox"/> Plumbing <input type="checkbox"/> None			
Sprinkler: <i>IN ALL for new Butane Extraction Booth Existing Tenant</i>			
PROPERTY OWNER INFORMATION REQUIRED			
Owner(s) Name(s) (As it appears on tax records): 7221 Jessup, LLC			
Owner's Street Address: 415 North Dearborne Street			
City: Chicago		State: Illinois	Zip Code: 60654
Phone: (301) 332-5054		Email: adam.millstein@verano.com	
TENANT INFORMATION REQUIRED			
Business Name: Freestate Wellness		Contact Name: Adam Millstein	
Street Address: 7221 Montevideo Road			
City: Jessup		State: Maryland	Zip Code: 20794
Phone: (301) 332-5054		Email: adam.millstein@verano.com	
APPLICANT NAME REQUIRED - INDIVIDUAL WHO SIGNS THIS APPLICATION			
Business Name: Verano Holdings		Contact Name: Adam Millstein	
Street Address: 7221 Montevideo Road			
City: Jessup		State: Maryland	Zip Code: 20794
Phone: (301) 332-5054		Email: adam.millstein@verano.com	
CONTRACTOR INFORMATION REQUIRED			
Business Name: RENewcomb			
Licensee's Name: Mike Newcomb		License #: 13642137	
Street Address: 9055 Maier Rd			
City: Laurel		State: Maryland	Zip Code: 20723
Phone: (301) 953-1935		Email: mike@renewcomb.com	
ARCHITECT/ENGINEER INFORMATION REQUIRED - INDIVIDUAL WHO SIGNED PLANS			
Business Name: BALA engineering		Name: Larry Gould	
Street Address: 7526 Harford Road			
City: Baltimore		State: Maryland	Zip Code: 21234
Phone: (410) 254-5800		Email: lpg@bala.com	
BUILDING CHARACTERISTICS (PLEASE SELECT/COMPLETE ALL THAT APPLY)			
Utilities: <input checked="" type="checkbox"/> Electric <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Water Supply: <input type="checkbox"/> Public <input type="checkbox"/> Private (Well) <input type="checkbox"/> Sewage Disposal: <input type="checkbox"/> Public <input type="checkbox"/> Private (Septic)			
Heating System: <input checked="" type="checkbox"/> Electric <input checked="" type="checkbox"/> Natural Gas <input type="checkbox"/> Propane <input type="checkbox"/> Other: <input type="checkbox"/> Roadside Tree Project: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes: #			
Sprinkler System: <input checked="" type="checkbox"/> NFPA 13 <input type="checkbox"/> NFPA 13R <input type="checkbox"/> None <input type="checkbox"/> Fire Alarm System: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Voice Evac			
ADDITIONAL COMMERCIAL INFORMATION (PLEASE SELECT/COMPLETE ALL THAT APPLY)			
Area of Construction: 150 sq ft		Gross Area: sq ft	Height: ft # of Stories:
Construction Classification(s):		Use Group:	
Was the tenant space previously occupied? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Shell Building Permit # (for interior completions):	
ADDITIONAL MULTI-FAMILY INFORMATION IF APPLICABLE			
# of efficiency units (MF):		# of 1 BR (MF):	# of 2 BR (MF): # of 3 BR (MF):
Energy Method: <input type="checkbox"/> Performance <input type="checkbox"/> UA Alternative <input type="checkbox"/> ERI <input type="checkbox"/> A 90.1		Gross Area: sq ft	Occupiable Area: sq ft
AGREEMENT/DISCLAIMER REQUIRED			
THE UNDERSIGNED HEREBY CERTIFIES AND AGREES AS FOLLOWS: (1) THAT HE/SHE IS AUTHORIZED TO MAKE THIS APPLICATION; (2) THAT THE INFORMATION IS CORRECT; (3) THAT HE/SHE WILL COMPLY WITH ALL REGULATIONS OF HOWARD COUNTY WHICH ARE APPLICABLE THERETO; (4) THAT HE/SHE WILL PERFORM NO WORK ON THE ABOVE REFERENCED PROPERTY NOT SPECIFICALLY DESCRIBED IN THIS APPLICATION; (5) THAT HE/SHE GRANTS COUNTY OFFICIALS THE RIGHT TO ENTER ONTO THIS PROPERTY FOR THE PURPOSE OF INSPECTING THE WORK PERMITTED AND POSTING NOTICES			
APPLICANT'S ORIGINAL SIGNATURE			DATE SIGNED: 4/05/2022
FOR OFFICE USE ONLY			
CHECKS PAYABLE TO: DIRECTOR OF FINANCE OF HOWARD COUNTY			
AGENCIES REQUIRED/APPROVALS:			
<input checked="" type="checkbox"/> PR	<input checked="" type="checkbox"/> DPZ	<input checked="" type="checkbox"/> DED	<input checked="" type="checkbox"/> Health <i>gjb 5/3/22</i> <input type="checkbox"/> SHA <input type="checkbox"/> CID
SUBMITTAL FEES: 200		PAYMENT: <i>CK# 105</i>	ACCEPTED BY: <i>[Signature]</i>

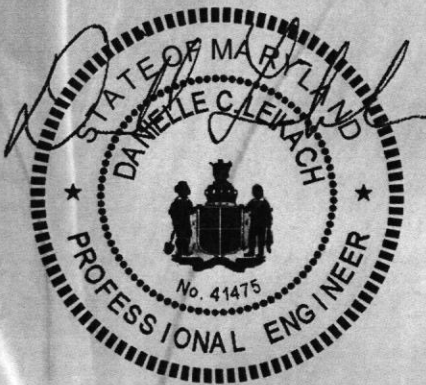
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Verano Holdings Medical Cannabis Facility

Hazardous Materials Analysis
Butane Extraction Booth Assessment

Prepared By:
Danielle Leikach, PE



March 11, 2022

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I. Introduction

A. Scope of Study

GHD was retained by Verano Brands (Owner) through Studio G3 Architects to conduct a fire safety assessment and hazardous materials analysis of the Butane Extraction Booth Room at the Freestate Wellness facility located at 7221 Montevideo Road, Jessup MD. The Owner would like to house a prefabricated Butane Extraction booth on the second floor of their facility, and has been required to prove that the storage of the associated hazardous materials meets local codes and standards in Howard County, MD.

The purpose of this report is to summarize the fire protection and life safety requirements stated in the current codes and standards in effect in Howard County as it pertains to the Hazardous Materials Butane Extraction Booth. The minimum code requirements that provide an acceptable level of fire/life safety are provided in this report.

B. Disclaimer

This document contains specific professional engineering analysis with key assumptions and clarifications taken into consideration. If any of the outlined assumptions or clarifications are altered in the field, namely the quantities of hazardous materials and the functionality of the prefabricated extraction booth, this document and its findings become null and void. The purpose of this document is to provide professional guidance on a specific storage arrangement and quantities of different types of hazardous materials. The analysis herein is not valid if any of these commodities, storage arrangements, or design considerations are altered in any fashion.

This report has been prepared by GHD for Verano Brands and may only be used and relied on by Verano Brands for the purpose agreed between GHD and Verano Brands as set out in this report.

GHD otherwise disclaims responsibility to any person other than Verano Brands arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

C. General

This study works in conjunction with the previous hazardous materials analysis dated February 5, 2018, performed by D&D Engineering, LLC. That study evaluated the proposed hazardous materials

and processes in the facility at that time, which included CO₂ extraction rather than butane extraction, and did not include any flammable gases or liquids. The previous study concluded that the quantities of hazardous materials did not exceed the maximum allowable quantities for a single control area. This current assessment of the addition of the butane extraction booth will assume that the those conclusions regarding hazardous materials quantities and storage arrangements still hold true. The current study focused only on the proposed butane extraction booth and associated flammable materials, and the limitations on maximum allowable quantities and systems requirements associated with these conditions.

The owner has informed GHD that they are currently storing a 270-gallon tank of ethanol in the first floor Warehouse space of the building, and that this quantity of Class IB Flammable liquid is existing to remain in the building. No other hazardous materials were identified outside of those noted in this report, but if other such materials are stored on site, this analysis must be revised to incorporate those quantities.

D. Applicable Codes

This analysis was conducted based on the 2021 editions of the International Building Code (IBC), International Mechanical Code (IMC), NFPA 101 Life Safety Code, and NFPA 1 Fire Code, as adopted and amended by the 2021 Howard County Code and 2021 Howard County Fire Prevention Code. The following codes are referenced:

NFPA 13 – Standard for Installation of Sprinkler Systems (2019 Edition)

NFPA 58 – Liquefied Petroleum Gas Code (2020 Edition)

NFPA 70 – National Electrical Code (2020 Edition)

NFPA 30 – Flammable and Combustible Liquids Code (2021 Edition)

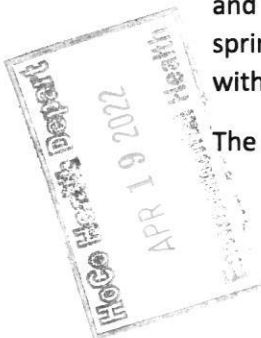
NFPA 91 – Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Particulate Solids (2020 Edition)

II. General Information

A. Building Details

The existing shell building was approved for Storage Group S-1, Factory Group F-1, and Business Group B use and has been updated to also include a Group M Mercantile use for the Dispensary, which was previously approved by Howard County. The building is of unrated Type IIB construction and is 38,227 sq ft. New phased additions to the warehouse include an extension of the second floor where new grow room storage spaces and extraction equipment will be located. The building is protected throughout with automatic sprinkler protection per NFPA 13, which will be maintained and extended as part of the renovations. GHD was not directly involved in any of the existing sprinkler system design but will be separately analyzing the fire suppression conditions associated with the expanded second floor.

The owner has confirmed that the building has no existing or intended control areas at this time.



B. Previous Findings

The previous study identified the following hazardous materials, as compared to their maximum allowable quantity (MAQ):

- Game Time – Flammable Solid - 2.2 lbs. present on site
 - MAQ: 500 lbs. in storage and 50 lbs. in open use
- GreenWorks Cleaners – Lightly or Moderately Toxic – 19 gallons present on site
 - MAQ: 200 gallons in storage and 25 gallons in use
- Dried Cannabis Flowers – Combustible Fibers
 - 200 cubic feet per control area and 40 cubic feet in open use at any time

The owner has also separately identified a 270-gallon tank of ethanol that is stored on the first floor in the warehouse area, which was not included in the previous D&D report but will be included in the flammable liquids analysis in this report.

C. Butane Extraction Booth and Vessel

The new Butane Extraction Booth is a prefabricated cabin unit, Precision Extraction Booth EXP-1, with X10 Extraction system manufactured by Precision Extraction that will be located on the second floor. It comes with all fittings and wiring for installation and can tie directly into the building fire alarm system, with audible and visual code compliant alarming systems. It has built in catalytic bead flammable gas detection with adjustable set point between 10-50% LEL and an explosion proof manual pull station that each activate high CFM fan, but not alarms, for off-gassing. The booth has exhaust and purge systems at the roof, with 1,200 CFM supply and exhaust with emergency flow of 100 linear feet per minute.

The electrical components inside of the booth, including sensors, strobe, compressor/vacuum pump, etc., are protected for Class 1 Division 1. The lights that illuminated the booth interior are protected as Class 1 Division 2 but are sealed off from the booth behind plexiglass with the electrical wires only accessible from the exterior of the booth. This setup makes it impossible for vapors to come into contact with the electrical components of the lighting. For this reason, the Class 1 Division 2 lighting is NFPA/IFC approved in the extraction booth.

The prefabricated booth was designed to meet the standards of NFPA 33, 58, 70, and 101, as well as the 2018 editions of the International Fire and Building Codes.

The extraction gas used in the processing will be a pre-mixed solution of:

- 40% n-Butane
- 40% Isobutane
- 20% Pentane

Additionally, the Owner has also requested to store two 100 lb. tanks of Butane within the extraction room, directly attached to the X10 Extraction system.

The X10 Extraction vessel will hold 10lbs of Butane mixture during active runs, with a 90% efficiency ratio, 10% of the butane used will be purged from the system and to run through the booth. The extraction vessel will reach 100 psi maximum pressure during operations.

D. Anticipated Hazardous Materials

The following table identifies the reported chemical inventory associated with the Butane Extraction process.

Table 1. Hazardous Materials Inventory

Chemical	CAS #	Physical State	Storage /Use	Hazardous Materials per Table 307.1(1)	Total Quantity	Storage Location
N-Butane	106-97-8	Liquefied Compressed Gas	In Use	Liquefied Flammable Gas, Compressed	40 lbs.	A-2-4 Within Extraction Booth
N-Butane	106-97-8	Liquefied Compressed Gas	Storage	Liquefied Flammable Gas, Compressed	200 lbs.	A-2-4 Within Extraction Booth
Isobutane	75-28-5	Liquefied Compressed Gas	In Use	Liquefied Flammable Gas, Compressed	40 lbs.	A-2-4 Within Extraction Booth
Propane	74-98-6	Liquid	In Use	Flammable Liquid IB	20 lbs. (4.6 Gal)	A-2-4 Within Extraction Booth
Ethanol	64-17-5	Liquid	Storage	Flammable Liquid IB	5 Gal	A-1-4 Stored in Freezer Unit
Ethanol (existing)	64-17-5	Liquid	Storage	Flammable Liquid IB	270 Gal	First Floor Warehouse

The Butane, Isobutane, and Propane in the extraction booth are combined as a 60/20/20 mixture, which is prepared offsite and delivered to the site in tanks. The tanks will then be transported into the booth to be secured and attached to the machine.

The 5 gallons of ethanol is stored within a Fire Rated Cabinet (Uline Model H-3683), which is located inside of an explosion-proof SO-LOW Freezer, Model DHH20-30SDFX, which meets NFPA and OSHA guidelines for hazardous locations, Class 1 Division 2, Groups C and D.

The previous hazardous materials study, performed by D&D Engineering, LLC, indicated that the presence of flammable solids, moderately toxic materials, and combustible fibers did not exceed the maximum allowable quantities for a single control area. The new materials associated with the butane extraction will not overlap with the hazardous materials that were previously identified,



though it is noted that the previous study did not include the 270 gallon ethanol tank in the warehouse storage area.

III. Code Analysis: Marijuana Growing, Processing, or Extraction Facilities

A. Room Construction

Per NFPA 1, Chapter 38, the cannabis extraction equipment and process shall be located in a room of noncombustible construction dedicated to the extraction process and the room shall not be used for any other purpose (NFPA 1 Section 38.6.1.1.2).

For extraction rooms using hazardous materials, each room shall be provided with at least one exit access door complying with the following:

- The door shall swing in the direction of egress
- The door shall be provided with a self-closing or automatic closing device
- The door shall be equipped with panic or fire exit hardware

Freezers for flammable liquids must be listed for those materials or Class I Division I. The freezer provided is listed for Group D so ethanol can be stored there (NFPA 1 38.6.1.6.2.2). The ethanol will also be stored within a cabinet inside the freezer.

B. Fire Suppression Requirements

An automatic suppression system shall be provided within hoods or enclosures, including ductwork, for Butane Extraction (NFPA 1, Section 38.6.2.5). The booth must be provided with sprinkler protection inside, extending the existing sprinkler system into the booth with penetrations sealed to maintain the integrity and ratings of the booth.

The booth shall be protected as Extra Hazard Group 1, per NFPA 13.

C. Gas Detection Systems

Approved continuous gas detection system must be provided (NFPA 1, Section 38.6.2.4). The gas detection system shall alert the extraction operator in an approved manner at a gas detection threshold no greater than 25% of the gas LEL/LFL. Some jurisdictions, such as the city of Denver, Colorado, sets this threshold at 10% of the LFL for the extraction process operators to specifically identify potential leaks during the extraction and additionally to determine when oil and spent plant material is finished off-gassing and is safe to be removed from the extraction area.

The fixed detector must be installed in accordance with the manufacturers' guidelines and depending on the size and configuration of the room, booth, or hood, additional detectors may be required. The fixed detection alarm is a local alarm only and does not require off-site monitoring and does not require full occupant notification of the building or extraction room (including ADA visual notification) as a fire alarm system may require. It is recommended that fixed detection is to alarm at 10% of the lower flammable limit. The method of alerting the extraction operator (audible / visual notification) is based on the type of the gas detector chosen.

D. Exhaust System Requirements (NFPA 1 Sections 38.6.2.2 & 38.6.3.2)

An approved exhaust system shall be provided for LPG extractions. The exhaust systems shall be installed and maintained in accordance with NFPA 91 or the mechanical code.

The design and operation of the exhaust system shall be such that flammable contaminants are diluted in noncontaminated air to maintain concentrations in the exhaust flow below 25 percent of the contaminant's lower flammability limit (IMC, Section 510.3).

All electrical components within the chemical fume hood or exhausted enclosure shall be interlocked such that the exhaust system shall be in operation for lighting and components to be used.

E. Electrical Requirements (NFPA 1 Section 38.6.2.3)

All conductive equipment and conductive objects within the exhaust room shall be bonded and grounded with a resistance of less than 1.0×10^6 ohms in accordance with NFPA 70. The area within a hood or enclosure used for LPG extractions shall be classified as a Class I, Division 1 hazardous location in accordance with NFPA 70. Areas adjacent to Class I, Division 1 locations shall be classified in accordance with NFPA 70. Class I Division 2 protection shall be provided within 3 feet of the opening to the booth.

All electrical components within the extraction room shall be interlocked with the hazardous exhaust system such that room lighting and other extraction room electrical equipment will only operate when the exhaust system is in operation.

A conduit seal shall be required in each conduit run leaving a Division 1 location, in accordance with NFPA 70, Section 501.15(A)(4). The sealing fitting shall be permitted to be installed on either side of the boundary within 10 ft of the boundary, and it shall be designed and installed to minimize the amount of gas or vapor within the portion of the conduit installed in the Division 1 location that can be communicated beyond the seal. The point at which the conduit leaves the Division 1 location shall contain no union, coupling box, or other fitting except for listed explosionproof reducer installed at the conduit seal.

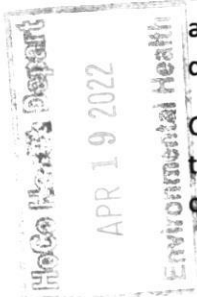
Automatic emergency power system shall be provided for the following items, when installed:

- (1) Extraction room lighting
- (2) Extraction room ventilation system
- (3) Solvent gas detection system

F. Findings

Based on the details of the pre-packaged Precision Extraction Booth, it appears that the code criteria are met, with the recommendation to provide sprinklers (EH-1) within the booth and exhaust ductwork.

Care must be taken to ensure that all penetrations through the booth boundary are sealed to meet the Class I Division 1 requirements. This includes electrical penetrations, but also penetrations for other systems, such as sprinklers.



IV. Hazardous Materials Analysis

A. Maximum Allowable Quantities

As described in Section II.D, Anticipated Hazardous Materials, the building will now contain new quantities of hazardous materials associated with the butane extraction booth that were not previously present. The code allows a prescribed maximum allowable quantity (MAQ) of the different types of hazardous materials, with the quantity increasing or decreasing based on storage configuration, presence of sprinkler protection, and location (floor level). If the quantities exceed the MAQ limit, then the space either needs to be divided into fire rated control areas, or further classified as and protected as the appropriate High-Hazard Group H occupancy. The following table describes the base-limitations for MAQ for Liquefied Flammable Gas and Class IB Flammable Liquids (IBC Table 307.1(1)):

Table 2. Base MAQs for Flammable Gas (Liquified) and Flammable Liquid (Class IB).

Material	Class	Use – Storage	Use – Closed System	Use – Open System
Flammable Gas	Liquefied Flammable Gas	150 lbs (1000 ft3)	150 lbs (1000 ft3)	NA
Flammable Liquid	Class IB	120 Gal	120 Gal	30 Gal

- The aggregate quantity in use and storage shall not exceed the quantity specified for storage.
- Storage is defined by IBC Section 202 as “The keeping, retention or leaving of hazardous materials in closed containers, tanks, cylinders, or similar vessels; or vessels supplying operations through closed connections to the vessel.
- Closed Use is defined by IBC Section 202 as “The use of a solid or liquid hazardous material involving a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations; and all uses of compressed gases. Examples of closed systems for solids and liquids include product conveyed through a piping system into a closed vessel, system or piece of equipment.”
- Open Use is defined by IBC Section 202 as “The use of a solid or liquid hazardous material involving a vessel or system that is continuously open to the atmosphere during normal operations where vapors are liberated, or the product is exposed to the atmosphere during normal operations. Examples of open systems include dispensing from or into open beakers or containers, dip tank and plating tank operations.
- Flammable gases can be increased 100 percent where sprinklers are provided, and then increased by 100% again where stored in approved cabinets, day boxes, gas cabinets, gas rooms or exhausted enclosures, or in listed safety cans.

- Similarly, Flammable Liquids in storage can be increased 100 percent where sprinklers are provided, and then increased by 100% again where stored in approved cabinets, day boxes, gas cabinets, gas rooms or exhausted enclosures or in listed safety cans. However, only the single 100% increase for the presence of sprinklers is provided for flammable liquid in use-closed systems or use-open systems.
- Therefore, the following table illustrates the MAQs with the allowable increases for each configuration:

Table 3. MAQs with allowable increases per storage/use configuration.

Material	Class	Use – Storage	Use – Closed System	Use – Open System
Flammable Gas	Liquefied Flammable Gas	600 lbs (4000 ft3)	600 lbs (4000 ft3)	NA
Flammable Liquid	Class IB	400 Gal	240 Gal	120 Gal

B. Control Areas

Control areas are spaces within a building where quantities of hazardous materials not exceeding the maximum allowable quantities per control area are stored, dispensed, used, or handled. Control areas are separated from one another with rated construction. At present, the building is considered a single control area, as based on the previous hazardous materials analysis performed by D&D Engineering. Because the building is two stories, the whole building control area must adhere to the limitation associated with being on the second floor. Control areas on the second floor above grade plane are limited to 75% of the MAQ (IBC Table 414.2.2). This reduces the maximum allowable quantities of the hazardous materials associated with the butane extraction booth as follows:

Table 4. MAQs with reduction for Second Floor.

Material	Class	Use – Storage	Use – Closed System	Use – Open System
Flammable Gas	Liquefied Flammable Gas	450 lbs. (3000 ft3)	450 lbs. (3000 ft3)	NA
Flammable Liquid	Class IB	300 Gal	180 Gal	90 Gal

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C. Findings

The following tables break down the quantities of each grouping of hazard materials present in the building, compared against the maximum allowable quantity of that hazard group for a single control area, based on the second-floor reduction.

a) Liquefied Flammable Gas in Use-Closed Systems

Chemical	Quantity	Total Quantity	MAQ
N-Butane	40 lbs.	80 lbs.	450 lbs.
Isobutane	40 lbs.		

MAQ for liquefied flammable gas in use-closed system will not be exceeded.

b) Liquefied Flammable Gas in Storage

Chemical	Quantity	Total Quantity	MAQ
N-Butane	200 lbs.	200 lbs.	450 lbs.

MAQ for liquefied flammable gas in storage will not be exceeded.

c) Liquefied Flammable Gas in Use-Closed System and Storage (Combined)

Use-Closed System	Quantity	Total Quantity	MAQ
Liquefied Flammable Gas Total	80 lbs. + 200 lbs.	280 lbs.	450 lbs.

MAQ for liquefied flammable gas in use-closed system and storage combined will not be exceeded.

d) Flammable Liquids Class IB

Chemical	Quantity	Total Quantity Present	MAQ Use – Storage	MAQ Use – Closed System	MAQ Use – Open System
Ethanol	5 Gal	279.6 Gal	300 Gal	180 Gal	90 Gal
Propane	20 lbs. (4.6 Gal)				
Ethanol	270 Gal				

MAQ for Class IB flammable liquid in storage will not be exceeded. Note that the 20-lb. (4.6 Gal) quantity of Propane is assumed to be in use, which is within the acceptable limit for in-use flammable liquids (180 Gal). However, the owner must maintain conditions that limits the in-use quantities of these materials, in both closed and open systems. The owner must ensure that the stored quantity of flammable liquids in the building does not exceed 300 gallons in total, or 180 gallons in use-closed systems at any time, or rated control areas will be required.

V. Conclusion & Recommendations

In conclusion, GHD finds that the Precision Extraction brand Butane Extraction Booth and the intended chemical inventory associated with the extraction process meet the current applicable code requirements for Howard County, MD. As a pre-packaged system, the booth has all the components necessary to provide a compliant protective enclosure for the butane extraction process. The

quantities of hazardous materials remain within the maximum allowable quantities for a single control area, and the materials present differ in classification from the materials previously studied and will therefore not change the previous hazardous materials analysis performed by others.

GHD makes the following recommendations:

- Provide the new butane extraction booth with sprinklers, protected as Extra Hazard Group 1, per NFPA 13.
- All penetrations through the booth boundary shall be sealed in accordance with Class I Division 1 requirements per NFPA 70, the National Electric Code.
- The owner shall maintain an up-to-date inventory of all hazardous materials in the building
- The owner shall take care to maintain quantities of hazardous materials in accordance with the MAQs described in this report.

