

# TRAINING OUTLINE

## CANNABIS EXTRACTION TECHNICIAN



### I EXTRACTION METHODS

1. Open Blasting as a Process
  - a. Flow Chart
  - b. Concept of Process
    - i. Feed
    - ii. Leaching
    - iii. Leachant/Solvent
    - iv. Loaded Solvent
    - v. Separation
    - vi. Barren Solvent
  - c. Recovery & Yield
  - d. Process Terms
  - e. Target/Product/Byproducts
  - f. Mass Balance
  - g. DO NOT DO OPEN BLASTING
  
2. Alcohol Tincture - Process
  - a. Heating/Decarboxylation
  - b. Different Solvents
    - i. Water
    - ii. Choice of Alcohol Product
  - c. Dissolution Rates
  - d. Target Compounds
  
3. Extraction Methods - Closed Loop Hydrocarbon Extraction
  - a. Solvents
  - b. Flow Charts
  - c. Pressurized Systems
  - d. Solvent Recovery
  - e. LPG Bottles
  - f. Refrigerant Recovery Pumps
  - g. Evaporation Vessel Operation
  - h. Heat Drives Evaporation
  - i. Products



4. Carbon Dioxide Extraction
  - a. Industrial Systems
  - b. Phase Diagrams – Supercritical Fluid
  - c. Flow Charts
  - d. Operating Conditions
  - e. Recovery of Solvents
  - f. Cryogenic CO<sub>2</sub>
  - g. High Pressure CO<sub>2</sub>
  - h. CO<sub>2</sub> Toxicity
  - i. CARBON MONOXIDE IS NOT CARBON DIOXIDE
5. Isopropyl Alcohol Extraction
6. Feed Preparation – Drying
  - a. Dry Feed to Extraction
  - b. Fresh Harvest
  - c. Machine Trim vs. Hand Trim
7. Candle Wax vs. Wax as a Product

## II CHEMISTRY OF EXTRACTION PROCESSES

8. Chemistry of Extraction Process
  - a. Solvent (Extractant) Characteristics
    - i. Polarity
    - ii. Solubility
    - iii. Phases
    - iv. Phase Transitions
    - v. Boiling Point
    - vi. Vapor Pressure
  - b. Leaching
  - c. Precipitation
  - d. Separation/Filtration
  - e. Partition Coefficients
  - f. Diffusion
  - g. Feed Characteristics
  - h. Temperature and Pressure Relationships
9. Solvent Purity – Butane/Air Venting



### III POST – EXTRACTION PROCESSING

10. Post-Extraction Processing
  - a. Frothing/Butter Production
  - b. Shatter Production with Vacuum Oven
  - c. Purification (Winterization) with Ethanol
    - i. Freezers
    - ii. Vacuum Ovens
  - d. Oils and Mixtures

### IV SEPARATION SCIENCE

11. Filtration
12. Filtration Media
13. Distillation
14. Solvent Extraction
15. Solvent Chemistry & Polarity
16. Solubility
17. Emulsifiers
18. Adsorbents
19. Decarboxylation

### V SAFETY AND ENVIRONMENTAL

20. Hazard Communication
  - a. Material Safety Data Sheets (MSDS)
  - b. Specifics for Solvents
  - c. Written Hazard Communication Program
21. Waste
  - d. Spent Trim/Leaf/Bud
  - e. Contaminated Solvent
  - f. Hazardous Waste
  - g. Recycling
22. Sanitation
  - h. Contaminants



- i. Physical
  - ii. Microbiological
  - iii. Animal/Insect
- i. Control
  - i. Disinfectants
  - ii. Traps/Screens
  - iii. Temperature Control
  - iv. Procedures
  - v. Construction
  - vi. Inspection

### 23. Safety

- j. Flammability
- k. Lower/Upper Explosive Limits
- l. Ignition Sources/Control
- m. Auto-ignition Temperatures
- n. Odor Thresholds
- o. Asphyxiation
- p. Toxicity
- q. Routes of Exposure
- r. Flammable & Toxic Gas Monitoring
- s. Personal Protective Equipment
- t. Leak Detection

## V ENGINEERING CONTROLS

### 24. Engineering Controls

- u. Ventilation
- v. Enclosures
- w. Hoods
- x. Pressure Relief
  - i. Valves
  - ii. Rupture Discs
  - iii. Venting
  - iv. Failure Point Design
- y. Fire and Building Code Hazardous Materials
- z. Monitoring & Testing Equipment
- aa. Fail-Safe Equipment



## VI REGULATIONS

### 25. Regulation

- bb. State of Colorado Marijuana Enforcement Division
  - i. Sanitation, Quality Control
- cc. Regulations M605 and R605
- dd. Local Fire Department
- ee. Federal Law and Legalization

## VII EXERCISES

### 26. Hands-On Exercises

- ff. Extraction System Demonstration/Discussion
- gg. Fittings/Pipe/Maintenance
- hh. Extraction Equipment
- ii. Monitoring and Testing Equipment
- jj. Leak Check

## VIII WRAP-UP AND EXAMINATION

### 27. Examination

### 28. Certification

