DENVER FIRE DEPARTMENT
FIRE CODE & INSPECTION OVERVIEW
COLLABORATION ACROSS ALL DENVER AGENCIES

- Denver Office of Marijuana Policy
  - Community Planning & Development
  - Denver Environmental Health
  - Denver Police Department
  - Denver Fire Department
  - City Attorney’s Office
  - Excise & License
  - Parks
  - 311
DENVER FIRE DEPARTMENT CURRENT STAFFING

• Denver Fire Department Staffing
  – 973 uniformed and 42 civilian staff

• Fire Prevention Division
  – 37 uniformed and 17 civilian
  ▪ Fire Prevention Staff Dedicated to Marijuana
    ▪ 1 Lieutenant
    ▪ 3 Inspectors (Technicians)
    ▪ 1 Fire Protection Engineer
    ▪ 1 Program Coordinator
DENVER FIRE DEPARTMENT INSPECTIONS

• Operations
  – Approx. 26,000 occupancies

• Fire Prevention Division
  – 6,000 FPB inspections
  – 640 MJ occupancies

• Certificate of Occupancy, License Sign Off, Fire Safety Systems Testing
MARIJUANA & DENVER FIRE DEPARTMENT

- Identifying marijuana facilities
  - CO/ License signoffs
  - Referrals
- Legal vs. Illegal locations
- Construction & Operational Permits
- Evolving hazards, policies
- Training, equipment
AREA OF MARIJUANA FIRE CODE REGULATION

Residencies Occupancies

CO-OPS

Commercial Occupancies (Licensed Businesses)

Dispensaries / Retail Sales

Marijuana Infused Product Manufacturing

Growing

Testing Labs
MARIJUANA IN RESIDENTIAL OCCUPANCIES

- 6 plants per adult
- Max of 12 plants per dwelling
- 2014 ordinance limiting extractions to 16 oz of alcohol and a non fuel fired / electrified heat source OR non flammable/combustible extraction processes
MARIJUANA COOPERATIVE GROW

• Collectives, CO-OPS, Community Gardens, etc.
• Non licensed growing
• Extraction process regulated under residential ordinance
• 2015 Ordinance passed limiting to 36 plants per zone lot
MARIJUANA COOPERATIVE GROW

2nd STORY
FIRE DEPARTMENT INVOLVEMENT IN LICENSED MARIJUANA BUSINESSES

**Application is submitted to ESL. An inspection card is issued with 4 Denver Agency signoffs required:**
- DFD, Environmental Health, Neighborhood inspections, and ESL

**FAIL**

**PASS**

**All agencies sign off inspection card**

**License issued: Business can legally operate**

**COMMON DFD INSPECTION ITEMS:**
- Were construction permits obtained for any work completed / required (mechanical, electrical, fire alarm, sprinkler, construction, etc)
- Were Fire Prevention operational permit(s) obtained (marijuana establishment/business, CO2 enrichment, extraction, etc)
- Do means of egress comply with Denver Fire Code (locks, access control, blocked exits, exit signage, etc)
- Does non-code compliant construction exist (use of plastic sheets to form walls, unsafe electrical, extension cords, etc)

**Construction plans submitted to Building Department typically including:**
- Change of occupancy or new building
- New walls or floor plan
- Hazardous exhaust for plant extractions
- Fire alarm / sprinkler
- CO2 enrichment systems
- Electrical upgrade

**PASS**

**FAIL**

**Permit issued: Work Complete**

**Reinpection OK for E&L license signoff**

**DFD Permit Inspections - CO Unit - Testing Unit - Hazmat Unit**

**Reinpection OK for E&L license signoff**
PERMITS AND INSPECTIONS – FACILITY TYPES

GROW
- OPC, RMC
- CO2
- HAZ/ FLAM

SALES LOCATION
- MMC, RMS

EXTRACTION
- MIP, RMP
- EXTRACTION
- TRANSFILLING

TESTING LAB
- RMT
- LPG STORAGE
MEDICAL MARIJUANA CENTER OR RETAIL MARIJUANA STORE

- Marijuana Sales (Recreational (21+) or Medical (18+))
- B or M occupancy Common Fire Code inspection items
  - Locking doors / access control violations
  - Construction without permits
MEDICAL MARIJUANA TESTING LABS

- B occupancy
- Gas Chromatography
- Compressed gasses
- Typically low volume of hazardous material storage / use
MARIJUANA EXTRACTION & PROCESSING

• F-1 Occupancy
• Types of Extraction
  – BHO (Butane Hash Oil)  SUPER/SUB CRITICAL FLUID EXTRATION
  – Carbon Dioxide
  – Flammable Liquids (Distillation or boil off)
  – Cold water extraction / Dry Ice / Food Based

• Oil Winterization, Dewaxing, Polishing
• Decarboxylation
MARIJUANA EXTRACTION & PROCESSING

Prohibited Open Blast Extractions
MARIJUANA EXTRACTION OVERVIEW

Prohibited open butane extraction
• Denver, 3 burn injuries
MARIJUANA EXTRACTION & PROCESSING

• Liquified Petroleum Gas (LPG) Extraction Process
MARIJUANA EXTRACTION & PROCESSING

• Equipment Approval:
  – 2009 IFC 2307.2.3 – Equipment processing hazardous materials shall be listed or approved
  – 2009 IFC 104.7.3 Technical Assistance

  – Master Report Approval vs. Site Specific Engineer Letter
MARIJUANA EXTRACTION & PROCESSING

- LPG Extraction Rooms
  - Closed loop
    - = No Release of Flammable Gas?
  - Non-Classified Electrical
  - 1 cfm/sqft low exhaust
    - = Hazardous Exhaust?
  - Hydro Carbon Alarm
MARIJUANA EXTRACTION & PROCESSING

• Extraction Room Changes Warranted
MARIJUANA EXTRACTION & PROCESSING

- Extraction Room Changes Warranted

ALARM
100% LFL
MARIJUANA EXTRACTION & PROCESSING

- Extraction Room Changes Warranted
MARIJUANA EXTRACTION & PROCESSING

• Extraction Room Changes Warranted
MARIJUANA EXTRACTION & PROCESSING

• Extraction Room Changes Warranted

OFF-GASSING SPENT PLANT MATERIAL AT 100% LFL
Proposed 2015 Denver Fire Code Amendment for Butane Extraction Rooms
- Class I Division I Electrical
  - Grounding and Bonding of Metal equipment in Room
- Hazardous Exhaust System
  - Emphasis on Capture & Containment provisions of IMC 510
- Non-combustible room construction requirements
- Extraction room door to swing in the direction of egress
- Fire suppression
MARIJUANA EXTRACTION & PROCESSING

• LPG Transfilling:
  – Nitrogen vs heated jacket
  – Classified Electrical
  – Outdoors*
  – NFPA 58
MARIJUANA EXTRACTION & PROCESSING

• Supercritical CO2:
  – CO2 detector required
  – CO2 discharge to be piped to the exterior
  – Equipment operates between 4,000-10,000 psi
  – Listing for electrical
MARIJUANA EXTRACTION & PROCESSING
MARIJUANA EXTRACTION & PROCESSING

• Distillation / boil off extractions
  – Flammable liquids used and are heated to off gas to atmosphere OR distilled and recaptured for reuse.
  – This operation requires a hazardous exhaust hood
  – Equipment must be rated for the intended use
MARIJUANA EXTRACTION & PROCESSING

- Distillation extractions / post oil processing:
  - RotoVap Distillation
MARIJUANA EXTRACTION & PROCESSING

- Distillation extractions / post oil processing
  - Distillation
MARIJUANA EXTRACTION & PROCESSING

- Boil off extractions
  - Boiling to atmosphere
MARIJUANA EXTRACTION & PROCESSING

• Distillation extraction
  – Commercial solvent extractor
MARIJUANA EXTRACTION & PROCESSING

- After the extraction:
  - Oil is typically put in a vacuum oven
**MARIJUANA EXTRACTION OVERVIEW**

Freezer explosions from butane marijuana extraction process

Courtesy thisweeknews.com

Courtesy KVAL News
MARIJUANA EXTRACTION OVERVIEW

Cold water extraction / Dry Ice / Food Based
MARIJUANA GROWING OCCUPANCIES

- F-1 occupancy
- Sprinkler requirements
- Exterior wall openings
- Hazardous materials
MARIJUANA GROWING OCCUPANCIES
MARIJUANA GROWING OCCUPANCIES

Wall Construction
MARIJUANA GROWING OCCUPANCIES

Corridors
MARIJUANA GROWING OCCUPANCIES

Grow Pods
Marijuana Growing Occupancy Hazards

CO2 Enrichment

- Typically growers use a generator or compressed CO2 to elevate CO2 levels to make plants grow faster
- Typical range is 1,500 ppm or less of CO2 in grow rooms
- OSHA 8-hour TWA limit for human occupancy in a CO2 environment is 5,000 ppm
- 40,000 ppm CO2 is the Immediate Danger to Life and Health (IDLH) by the CDC
- CO2 alarms are required and set to alarm at 5,000 ppm
MARIJUANA GROWING OCCUPANCY HAZARDS

CO2 Generators
- Natural gas fueled vs Propane

HAZARDS
- Potential Elevated CO2 level
- Potential Elevated CO level
MARIJUANA GROWING OCCUPANCY HAZARDS

CO2 Enrichment using compressed gas

HAZARDS
- Potential Elevated CO2 level
MARIJUANA GROWING OCCUPANCY HAZARDS

Compressed CO2 Enrichment Equipment
MARIJUANA GROWING OCCUPANCY HAZARDS

CO2 Enrichment Detection & Notification
MARIJUANA GROWING OCCUPANCY HAZARDS

CO2 Enrichment Detection & Exhaust
MARIJUANA GROWING OCCUPANCY HAZARDS

CO2 Enrichment Placards & Signage
MARIJUANA GROWING OCCUPANCY HAZARDS

Fumigation
  – Using Sulfur burner to create Sulfur Dioxide
  – CO2 enrichment above levels to support life

HAZARDS
- Sulfur when burned creates sulfur dioxide, if inhaled creates sulfuric acid
- CO2 levels increased to non-life supporting levels to kill bugs
PESTICIDES AND FUMIGATION

- Pesticide Inventory Statement
  - Renewed annually, modified as needed.
- Enforcement of pesticides and regulation of type and use is under the jurisdiction of the CDA and EPA.
- Sulphur burning, hazards and enforcement issues.
MARIJUANA GROWING OCCUPANCIES
IS THIS HIGH PILE STORAGE OR SOMETHING DIFFERENT?
INSPECTIONS

• Residential / COOP inspection task force
• License / CO Inspections
• Semi annual compliance inspections
• Inspection hazards common in marijuana facilities:
  - Locks, Knox Box
  - Power Strips
  - Adding, modifying space without permits (expansion into adjacent units)
  - Lack of required construction and/or operational permits
INSPECTIONS

Non compliant construction after Certificate of Occupancy
INSPECTIONS

Blocked Means of Egress

Fire in grow - one occupant trapped
INSPECTIONS

Broken lamp. Lens in place.
INSPECTIONS

Electrical Hazards:
- Doors left open & fans used to cool panel
- Use of extension cords or power-strips to grow lighting is prohibited
Entanglement Hazards

Lighting systems and cooling ductwork are typically suspended to be raised / lowered as plants grow. This is a potential entanglement hazard during fire operations.
ADDITIONAL TIME DEMANDS

• Illegal Occupancy/ Operations
• Meetings
• Court Appearances
  – 2015 to date: 140 hours
  – 2015 Citations: 33
• CORA Requests
  – Requests for information, time sensitive
• Permit/ Construction Process Consults
• Operational Permits – 2015 to date: 955 permit items
OTHER INSPECTION CHALLENGES

• Coordination and group inspections.
• Resolution of conflicting requirements.
  – State vs local
  – Agencies
• Identifying concerns for other agencies, referrals.
  – Public health
  – Electrical inspectors
  – Excise and License
  – Police
• Safety
  – Building safety
  – Pesticides, chemicals
  – Security
  – Weapons, other drugs
Questions???