Cannabis Waste Management

Presented Q3 2022 by:
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ASTSWMO Joint Hazardous Waste and Materials Management Training

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Mike Bankoff is an Environmental Protection Specialist with the Colorado Department of Public Health and Environment. Mike works on a wide variety of solid waste and materials management issues, with a focus on the beneficial use of solid waste.

Mike has a diverse background with over 12 years of experience in environmental consulting, hazardous waste management, and environmental restoration.

In recent years, Mike has authored a number of the Department's compliance bulletins for solid and hazardous waste management in the cannabis industry.

Environmental Impacts of Cannabis Cultivation

Energy for lighting and HVAC

Solid waste, universal waste, and hazardous waste

Influent water treatment, irrigation, run-off, erosion, and wastewater effluent

Air emissions *Terpenes= VOCs & Odor* + CO_2 Supplementation

Chemical use – pesticides, fertilizers, cleaners and solvents

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Environmental Impacts of Product Processing

Solvent evaporation contributes to ozone formation (VOCs)

CO_2 releases from Extraction

Cleaning products

Haz Waste = Spent solvent

Plant waste (no fiber recovery if ground-up)

Energy for equipment and high HVAC

Every sector of industry, from cultivations to dispensaries, have their own waste issues

*Must meet C1D1 fire code

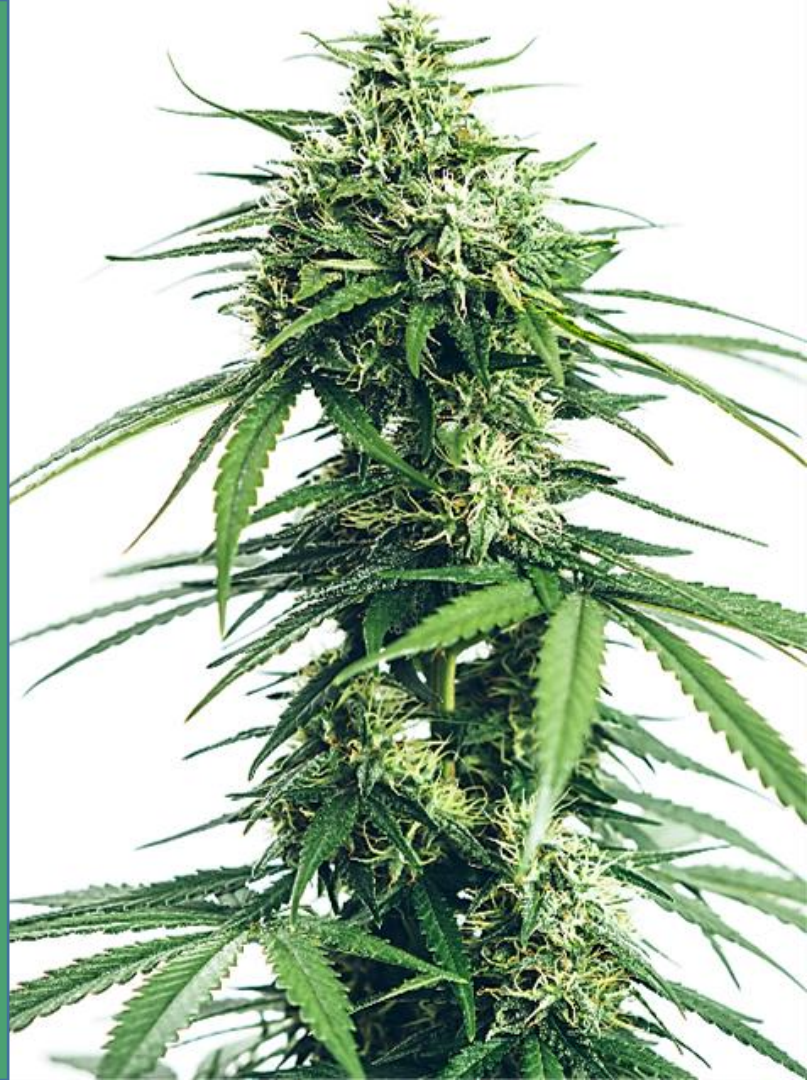
Agenda

Waste Impacts and Management

- Packaging Waste
- Lighting Waste
- Hazardous Waste
- Plant waste
- Composting
- Non-hazardous liquids
- Take-back & Reuse Programs

Recent/Emerging Issues

Resources to learn more!



Waste Impacts and Management

Packaging Waste

Lots of Packaging Waste!

Global Market Forecast

$1.6 Billion by 2024

Small and hard to sort at recycling facility

Plastic… Plastic… And More Plastic!

Similar To Food Packaging = <u>Single Use</u>

Packaging Waste

Recycling

- Normal Options?
- Take Back Programs?
- THC Residue?

Packaging Options

- Potential Hemp Packaging?
- Veggie Oil/Starch Derived Plastics

Lighting Waste

Growers and Large Facilities

- Flourescent or LED?
- Potentially High Volume

Universal Waste

- Characterize
- Storage requirements?

Recycling options

Hazardous Waste

- Cultivations - Should not have hazardous waste from pesticides in legal grows. Illegal grow operations - assume the worst.
- Extraction facilities - Spent solvents may or may not be hazardous. Solvent-soaked plant waste - may or may not be hazardous depending on solvent and degree of residual liquid.
- Facilities must do their own haz waste determination.

Hazardous Waste continued…

Evaporation = Violation

Inter-state transport complications

In-state fuel blending options?

Storage requirements will depend on haz waste generator status

Most haz waste enforcement has been around generator status

Household hazardous waste (HHW)

Excluded from regulation as hazardous waste

HHW collection facility or collection event, if available

For marijuana plant material and marijuana-infused products, recommend following the guidance on rendering it “unusable and unrecognizable”

Plant Waste

Prior CO rules - excessive waste footprint

50/50 mixing required for “marijuana waste”

Updated CO rules
“Regulated marijuana” - narrower definition
Still “unusable and unrecognizable”
Mixing or new options available

Low-THC wastes

50/50 mixing not required

Composting

Controlled Decomposition of Organic Matter

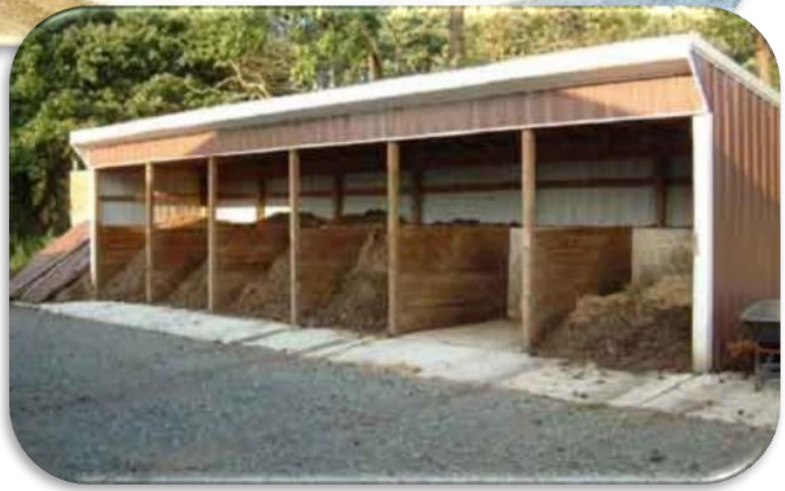
Can be done on-site

“Close the Loop”

-In-Vessel Composting Systems

-Aerated Static Piles (ASP)

-Indoors or Covered Bay System



Composting

Material Sent Off-Site

-Should go to a registered/licensed professional

-Potential Issues

- -What's in it?

    What chemicals/fertilizers/etc. were used?

- -Municipal Sites

    Registered/licensed

    But can't really handle this type of material in large amounts

-Mixing and Hauling Requirements?

-Composters can meet these requirements

Hemp

- Must be <0.3%THC content, dry-weight basis
- Not subject to “unusable and unrecognizable” criteria
- Still need to make hazardous waste determination on post-extraction hemp
- If “hot hemp” (>0.3%THC) then CDA will oversee crop destruction or fiber recycling options may be available
- CHAMP Initiative

https://ag.colorado.gov/plants/hemp/champ-initiative

https://cdphe.colorado.gov/greening-the-cannabis-industry

NON-HAZARDOUS LIQUID WASTES

Spent irrigation water, cleaning wastewater:

- Send to wastewater treatment plant
- Reuse?
- Land application?

Nutrient solutions, non-hazardous pesticides, liquid cleansers, non-hazardous solvents, etc.

- Reuse?
- Solidify for landfill disposal?

CO Recent MJ Waste Policy Changes

Sustainability

Packaging -
Take-Backs, Recycling, Reuse

Plant Waste-
Direct Composting

Colorado Plant Waste Rule Change *(eff. Jan 2020)*

1. Organic marijuana waste **rules have changed to allow for easier composting** of stalks, stems, fan leaves and roots without having to mix 50% with non-marijuana waste

2. **Cultivators should** side stream stalks, stems, fan leaves and roots for **compost** pick-ups *(still mix buds, post-extracted material, etc 50/50)*

1. **Waste Haulers need written contracts with cultivators** to accept unmixed stalks, stems, fan leaves and roots as compost.

2. Work with compost facilities to **understand what material can and cannot be composted** *(some won't accept grow media)*

Best Practices for Plant Waste

Composting and diversion from double landfilling

- **No 50/50 mixing** for disposal of low-THC waste
- Anaerobic Digestion, Biochar, Gasification?

Recover stalks and stems for industrial fiber applications

Cannabis Fibers are STRONG!!!

Best Practices for Other Waste Streams

Packaging waste = Most not easily recyclable

Take-back Programs for Recycling or Reuse

Spent Solvents = Hazardous Waste ?

Electronics and batteries = E-waste

Mercury-containing lighting and ballasts stored & disposed of properly

Grow Media - regenerative is best!

Recent and Emerging Issues

- Synthetic THC increasing processing activities
- Young, inexperienced staff not aware of many compliance issues
- Distillation and recapture may avoid haz waste treatment issue for off-gassing
- Incinerator backlog
- Lack of sustainable infrastructure for a growing industry

Key Takeaways for Cannabis Waste

1. Plant waste should be composted or repurposed. Let’s stop landfilling at double the weight.
2. Reduce, reuse, recycle plastic packaging.
3. Solvent waste can be hazardous waste.

National Cannabis Industry Association's Environmental Sustainability Report

- Environmental Impacts
- Best Management Practices
- Policies

Necessary to position the cannabis industry as a leader in environmental sustainability and to help influence environmental policy that comes along with federal legalization.

https://thecannabisindustry.org/wp-content/uploads/2020/11/NCIA-Environmental-Policy-BMP-October-17-final.pdf

Project Managed by Kaitlin Urso, CO SBEAP

Colorado Cannabis Sustainability Resources

cdphe.colorado.gov/prevention-and-wellness/marijuana/greening-the-cannabis-industry

- Air Impacts, Permitting, and BMP Guidance
- Waste Management Guidance
- Environmental Leadership Program
- Sustainability Resources

Cannabis Regulators Association (CANNRA)

www.cann-ra.org

A NONPROFIT ORGANIZATION OF GOVERNMENT OFFICIALS INVOLVED IN CANNABIS REGULATION

Our mission is to support governmental jurisdictions responsible for implementing cannabis policies and regulations by fostering collaboration and coordination to identify and share best practices that safeguard public health and consumer safety, promote equity, and create regulatory certainty for industry participants.

Thank You!
Questions?

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cdphe.colorado.gov/greening-the-cannabis-industry