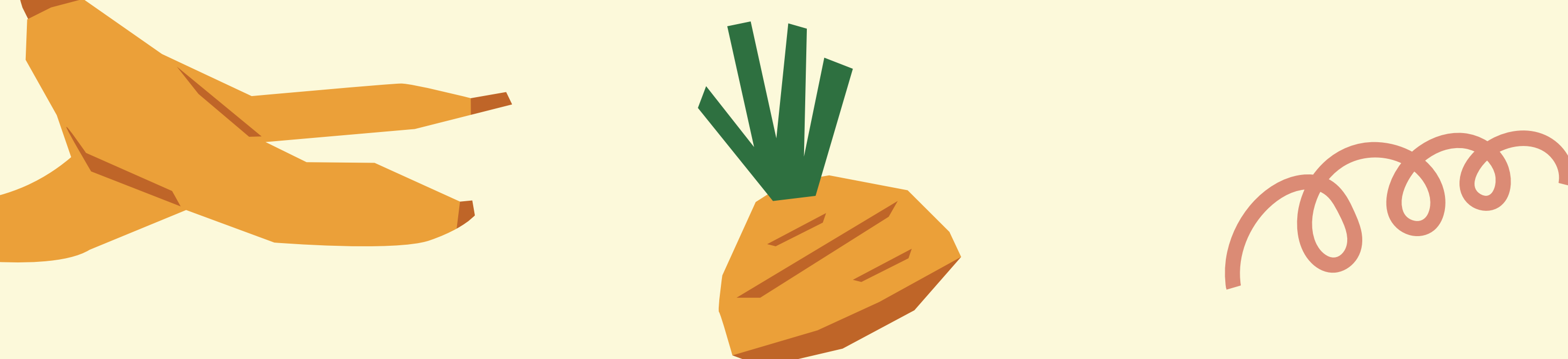
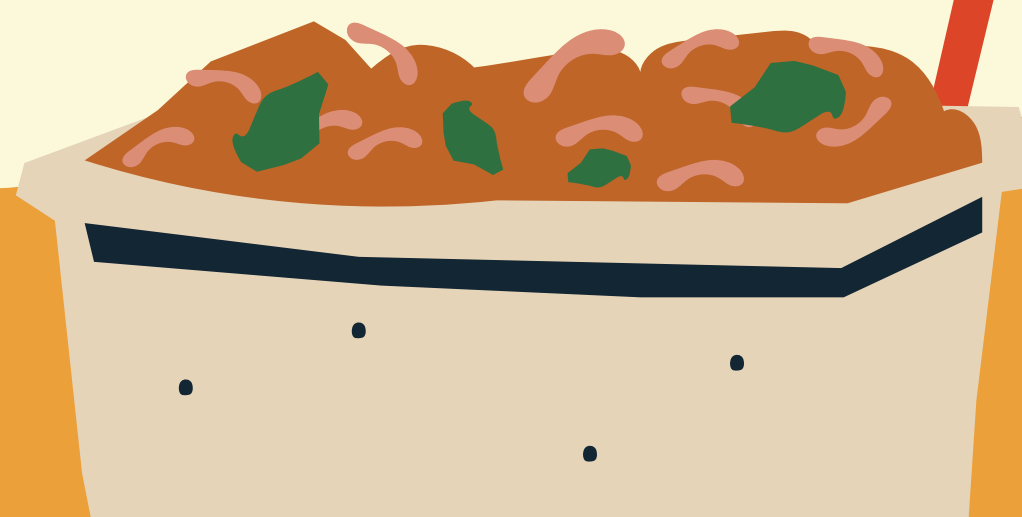




COMPOSTING GUIDE

Turning Organic Waste into Healthy Soil
brought to you by: Bio-waste Technologies





WHAT IS COMPOSTING?

Composting is the natural breakdown of organic materials (like food scraps, yard waste, and manure) by microorganisms and decomposing organisms into a rich, dark material called compost. It enriches the soil, improves water holding capacity by 200% its weight and reduces waste.

This practice not only allows us to turn organic waste into fertilizer that benefits the soil, but also helps reduce the volume of waste that ends up in landfills.

- Reduces landfill waste and methane emissions
- Produces free, nutrient-rich soil amendments
- Supports climate resilience and soil health
- Encouraged by the EPA as a top-tier waste reduction method



WHAT YOU CAN COMPOST

"Greens" (Nitrogen-rich)

- ✓ Fruit and vegetable scraps
- ✓ Coffee grounds and tea bags (no staples)
- ✓ Grass clippings
- ✓ Manure from herbivores

"Browns" (Carbon-rich)

- ✓ Dry leaves
- ✓ Straw or hay
- ✓ Shredded paper or cardboard (non-glossy)
- ✓ Sawdust from untreated wood



DO NOT COMPOST

- ✗ Meat, fish, or dairy
- ✗ Grease, oils, or fats
- ✗ Pet waste (cats/dogs)
- ✗ Diseased plants or pesticide-treated material
- ✗ Plastic, glass, or metals



HOW TO START COMPOSTING

1. Choose a shady, well-drained site.
2. Add 6–12” layer of browns (leaves, straw).
3. Add a thin layer of greens (kitchen scraps, manure).
4. Continue layering greens and browns.
5. Moisten to feel like a wrung-out sponge.
6. Turn pile every 1–2 weeks or if you ever see steam to prevent spontaneous combustion.

COMPOST RECIPE TIPS

- Aim for a 30:1 Carbon to Nitrogen ratio
- Use 2 parts browns to 1 part greens
- Chop materials to speed decomposition



HOW LONG DOES IT TAKE?

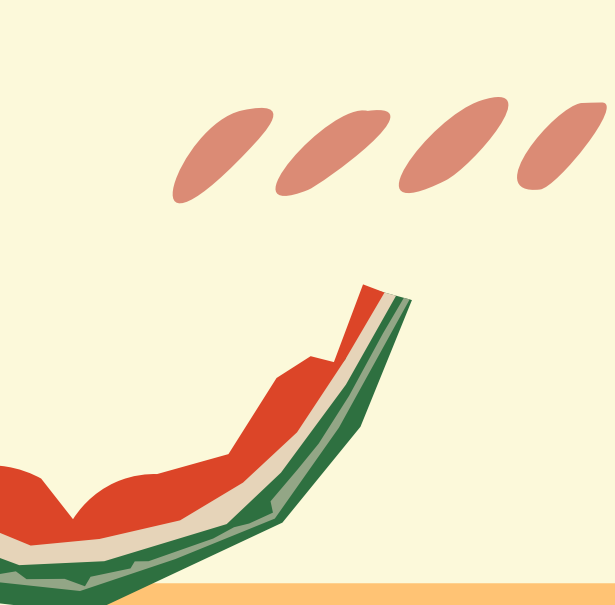


- Hot composting: 2–3 months (requires turning)
- Cold composting: 6–12 months (low effort)
- Worm composting: 2–4 months (small scale)

SIGNS COMPOST IS READY:

- Dark, crumbly texture
- Earthy smell
- No visible food scraps





TROUBLESHOOTING

Problem

Bad odor
Dry pile
Pests attracted
Slow breakdown

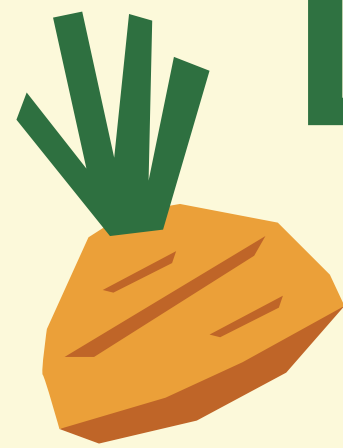
Cause

Too wet or too many greens
Not enough moisture
Food exposed
Poor balance or airflow

Solution

Add browns, turn pile
Moisten lightly
Bury scraps, cover well
Adjust mix, turn, moisten





DESTRUCTION AND DECOMPOSITION PROCESS



Here are the steps that occur in this process:

DESTRUCTION

Organic materials are broken down into smaller particles through physical and biological processes. This initial decomposition prepares the material for further decomposition.

DECOMPOSITION

Microorganisms, such as bacteria and fungi, then break down organic materials into simpler compounds such as carbon dioxide, water, and nutrient-rich humus. This stage is very important for turning waste into nutrient-rich compost.

NUTRITION CYCLE

Decaying organic matter, or humus, becomes a valuable source of nutrients for plants, thus completing the nutrient cycle. This nutrient-rich compost can then be used to fertilize the soil and increase plant growth.





THANK YOU

Connect with indigenous values and let's continue to collaborate and contribute to preserving our earth for a better future.

Bio-waste Technologies LLC

-Join us on Facebook, You tube, and Instagram
@ bio-waste technologies
-biowastetechnology@gmail.com
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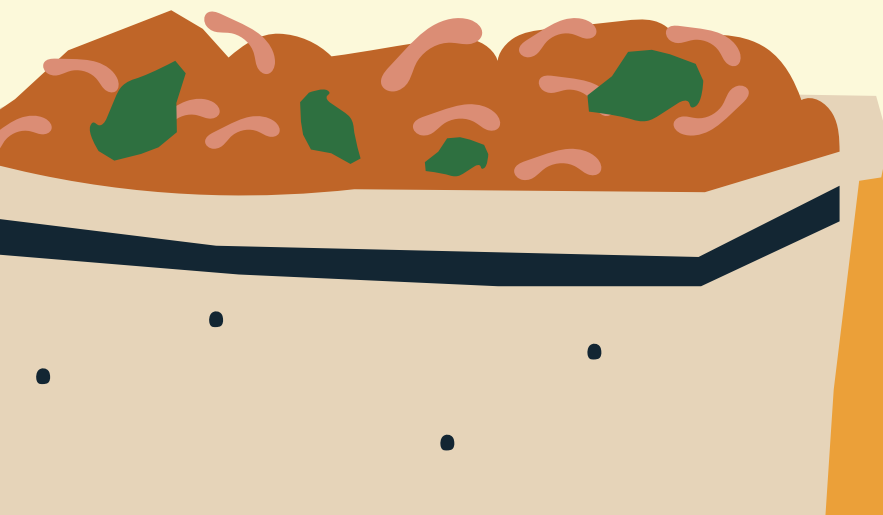
HOW TO VERMI-COMPOST

Turning Food Scraps into Black Gold with Worms
By: Bio-waste Technologies LLC



WHAT IS VERMICOMPOSTING?

- 
- Vermicomposting is the process of using specific worms (usually red wigglers, *Eisenia fetida*) to decompose food and organic waste, turning it into a nutrient-rich soil amendment known as worm castings.





BENEFITS (EPA & ENVIRONMENTAL)

- Diverts food waste from landfills
- Reduces methane emissions
- Creates a natural fertilizer free from chemicals
- Supports soil regeneration and microbial health
- Great for indoor or small-space composting
- gets us closer to the executive order to reduce 50% of food waste by 2030
- sequesters carbon
- water holding capacity is 200% of its dry weight
- Improved Plant Health
- Erosion Prevention



WHAT YOU NEED

Worm bin

2x Plastic 5 gallon buckets with lids

Bedding

Shredded newspaper, cardboard, coconut coir, or leaves

Worms

Red wigglers (*Eisenia fetida*) – NOT nightcrawlers

Food scraps

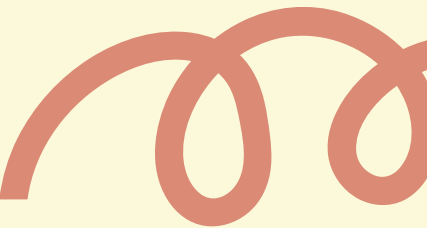
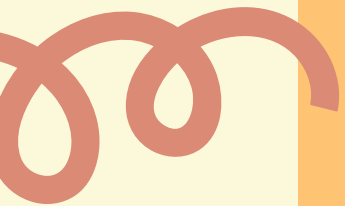
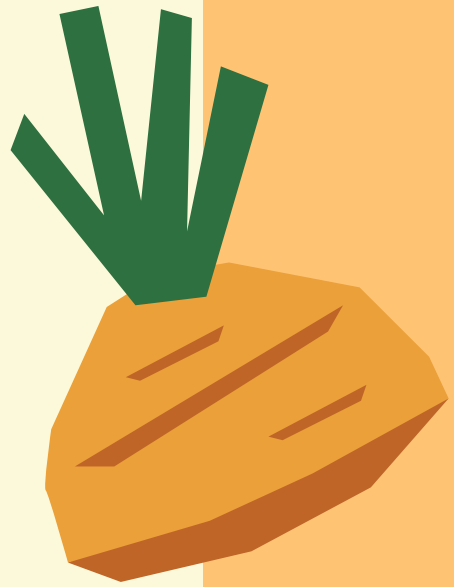
Veggie peels, coffee grounds, fruit waste, etc.

Moisture

Bedding should feel like a wrung-out sponge

Airflow

Small holes in bin sides/lid to provide oxygen



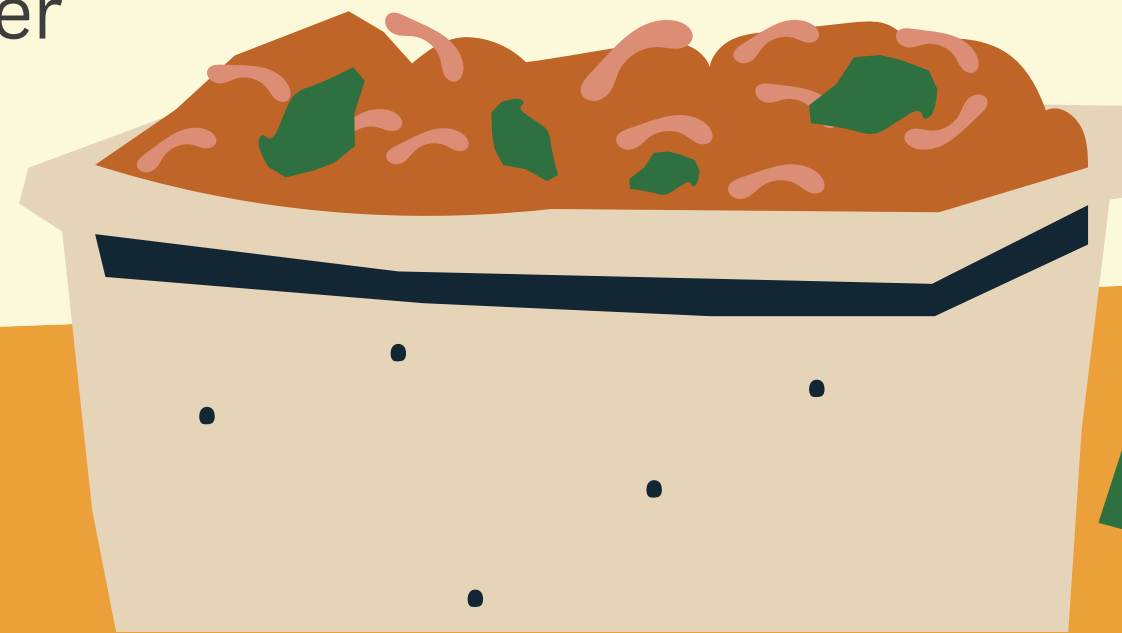
WHAT TO FEED WORMS

YES (Green Waste):

- Fruit and veggie scraps
- Coffee grounds & filters
- Crushed eggshells
- Tea bags (no staples)
- Bread (in moderation)

NO (Avoid These):

- Meat, dairy, or oily foods
- Citrus or spicy foods
- Pet waste
- Plastics or glossy paper



HOW TO SET UP YOUR WORM BIN



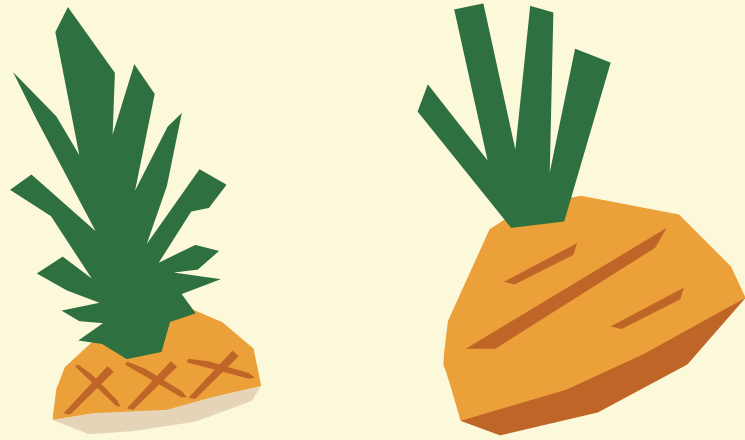
- Drill holes in top lid for air flow. For drainage drill holes on the bottom of one bucket only.
- Add bedding (~3-6 inches deep); moisten it.
- Add worms to top; let them settle.
- Bury food scraps in small pockets within bedding.
- Cover scraps with bedding to reduce odor/fruit flies or put an old T-shirt on top of bucket then place lid on top.
- Place bin in a shaded, cool indoor or covered outdoor area (55–77°F ideal).



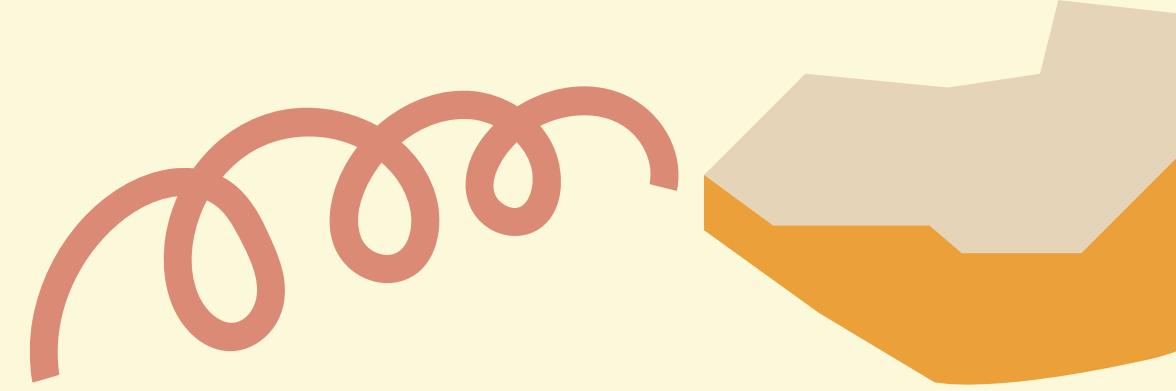
MAINTENANCE TIPS

- Feed worms weekly (small amounts at a time) for 2 pounds of red worm 1 pound per day. Red worms can eat half their body weight in one day.
- Keep bedding damp but not soaked.
- Gently fluff bedding every 1–2 weeks for air.
- Add dry bedding if it smells sour (too wet).
- Harvest castings every 2–3 months.





HOW TO HARVEST VERMICOMPOST



Method 1: Light Sorting (Fastest)

- Dump contents onto a tarp in the sun.
- Worms will burrow down away from light.
- Scoop off top layers of compost.
- Repeat until mostly worms remain.

Method 2: Continuous Flow Feeding

- continuously feed bucket.
- use new or old bedding + food to the top of bucket.
- Wait 1–2 weeks, Worms migrate to fresh food.
- Scoop finished compost from bottom of bucket.





Using Vermicompost

- Mix into potting soil (10–20% volume or 1-2lbs for every 10 lbs).
- Side-dress around plants.
- Brew worm tea (compost + water + aeration) for a liquid fertilizer.





Troubleshooting

Problem	Cause	solution
Bad odor	Too much food or moisture	Stop feeding, add dry bedding
Fruit flies	Exposed food	Always bury food scraps
Worms escaping	Bin too wet, hot, or acidic	Check bedding, pH, and airflow





THANK YOU

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Intro to Biogas

In conversation with expert David House



Meeting Agenda

Trauma Informed Space
Agreement
Introductions
NDTIA!P Case Study
Stahlbush Isl. Farms Case Study
Food and Energy Systems
Discussion
Concludes



Trauma Informed Space Agreement

3

First Foods Policy Program strives to provide services that are Trauma Informed and will work to maintain a space that is supportive, conducive to learning, and will reduce harm at all possible opportunities.

To do this, we ask that participants agree to the following terms. **By remaining in this space today, you agree to:**

- Bring a learning mindset instead of an expert mindset
- Set a safe space: What's said here stays here, what's learned here leaves here
- Listen with curiosity & compassion
- Be patient, practice taking a pause
- Listen with empathy
- Hold space for multiple truths
- Create a judgment free zone
- Ask for what you need
- Commit to open two-way communication
- Keep each other safe
- Contribute to the well-being of the group
- Speak with intention, use "I" statements
- Be polite and respectful
- Understand that people are the experts in their own experiences
- Keep in mind we are all working towards a common goal

First Foods Policy Program will work to keep this space as safe as possible for you to share your experiences and learning with others. We reserve the right to give warnings to those who are not abiding by this agreement. If you are warned and do not change the offending behavior, First Foods Policy Program reserves the right to ask you to leave.



Introductions!

Meet David House

Introduction prompt:

**What role do you play in
our food and energy
systems?**



Nixyaawii, Don't Throw It Away! Project























Importance of
**FOOD
WASTE
MANAGEMENT**

BIO-WASTE TECHNOLOGIES | Presented by DeArcie Abraham



BIO-WASTE TECHNOLOGIES

Good Day!

Thank you for taking a closer look into food waste. We will discuss the importance of waste management



Food loss refers to loss at or near the farm and in the supply chain, for example, during harvesting, storage, transport with the largest coming from consumer levels

Types of Waste

Classification

organic waste includes:
food, paper, lumber and
other organics

Characteristics

Organic waste consists of
biodegradable materials that
were once part of A living
organisms and decompose
rapidly.



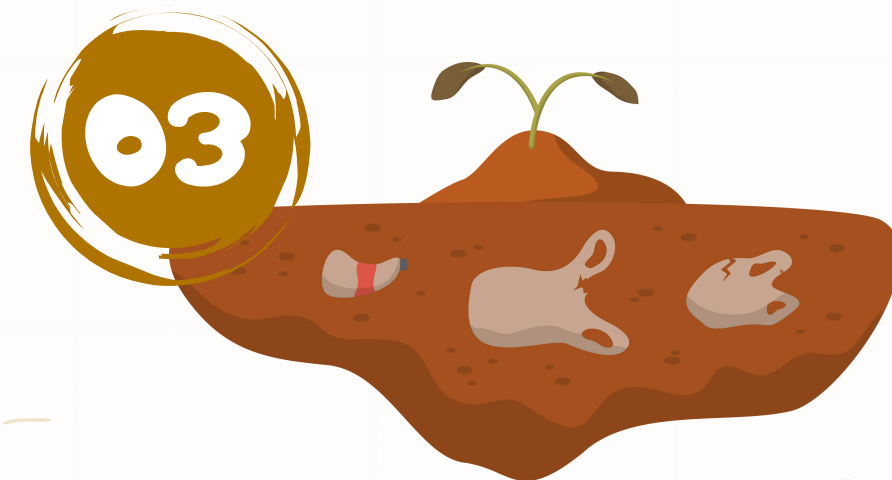
Challenges in Waste Management

Environmental Impact

→ Food waste accounts for one-third of all human-caused greenhouse gas emissions, food production uses 70% of global freshwater & uses half of habitable land for farming.

Social and Economic Challenges

→ When food is wasted, it also wastes the resources involved in its production. Examples include land, water, energy, labor used for growing, storing, processing, distributing, and preparing it. Food is the largest component of American waste in landfills. Once in landfills, wasted food generates methane, a potent greenhouse gas.



Waste Management Techniques



Reduce, Reuse, Recycle

REDUCE: buy, produce, & use less

REUSE: By offering edible food to humans then animals and lastly you local food waste collection site like First food & Bio-Waste

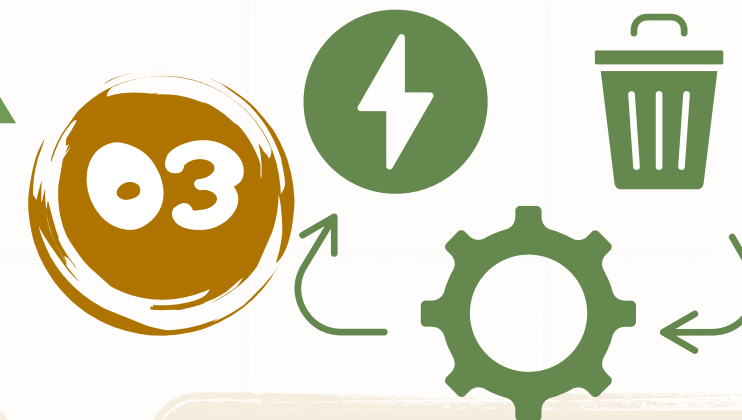
RECYCLE: use end products in yard, garden or farm to add fungus, beneficial bacteria, and microorganisms to the largest living organism soil!

*SEE EPA HIERARCHY GRAPH



Composting

Composting protects the climate by diverting organic waste from landfills, composting reduces the pressure on limited landfill space and reduces methane emissions from landfills



Waste-to-Energy

Anaerobic digesters or biodigesters, produce biogas. When fed organic material such as food waste, agricultural residues, and animal or human manure microorganisms decompose the material in the absence of oxygen, converting it into biogas. This biogas can then be used for heating, cooking, transportation, and other needs.

Case Studies or Best Practices

Local or Global Examples

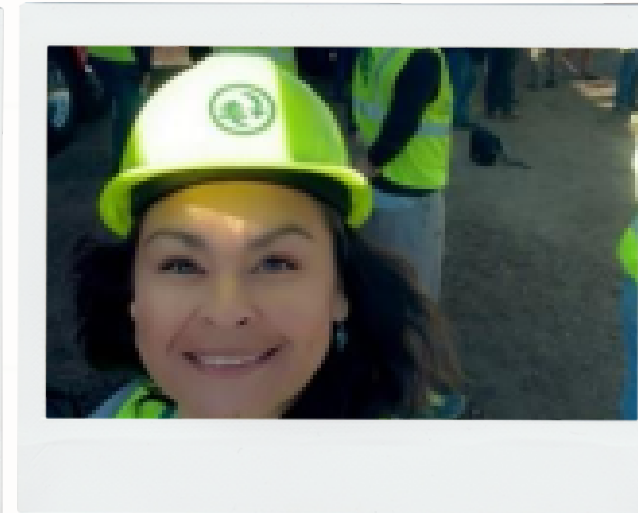
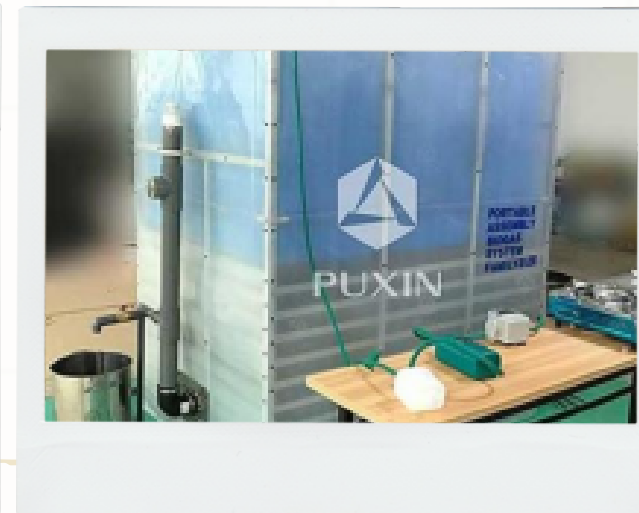
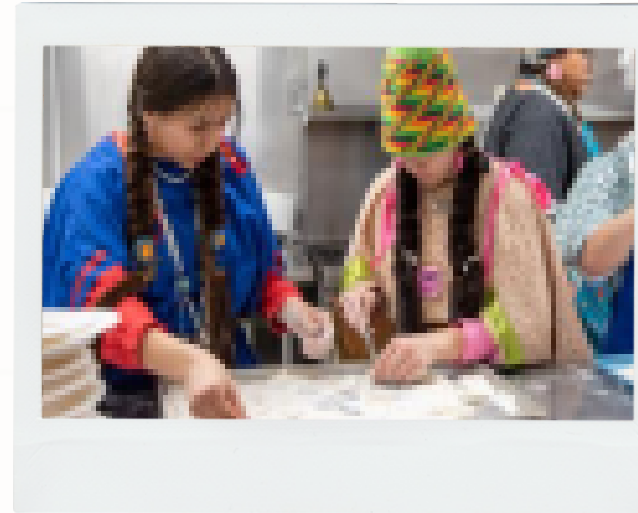


Analysts now suggest bioenergy could make a significant contribution to achieving the U.N.'s 17 Sustainable Development Goals, and also help nations hit their emissions targets under the Paris climate agreement.

Innovative Solutions



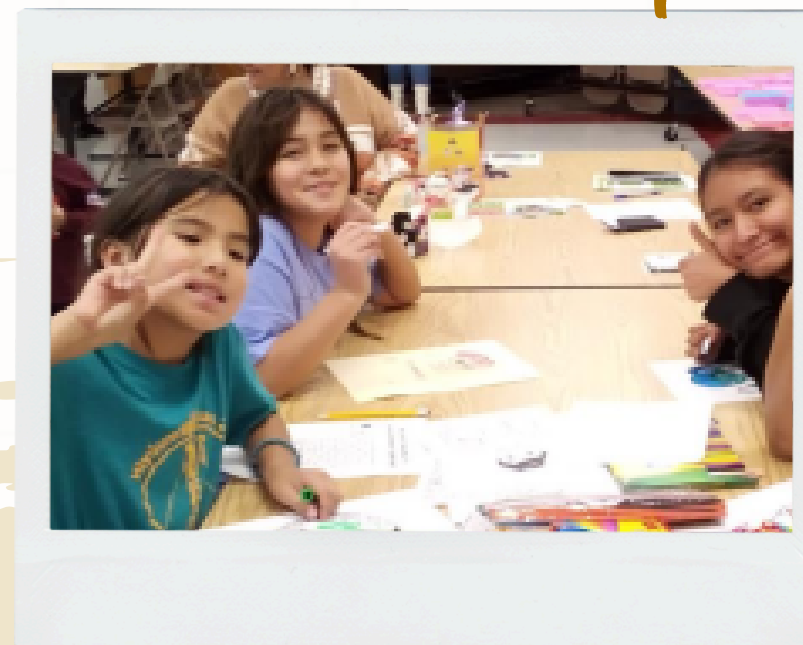
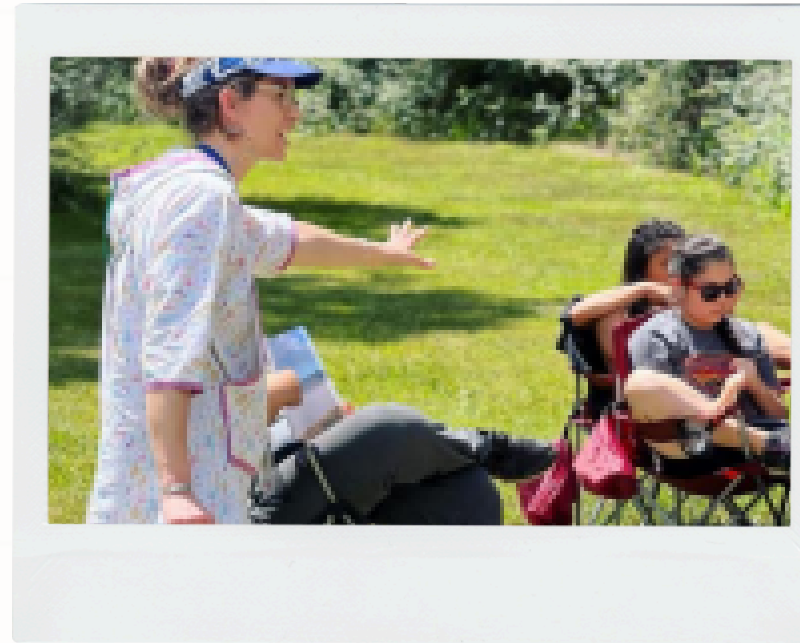
There are many technologies currently in use for food waste management, including composting systems & anaerobic digesters for biogas production



Community Involvement and Education

Importance of Public Participation

Addressing food waste is critical due to its social, economic, and environmental impacts. About 65% of food waste at the household level is avoidable



Education Programs

Educating the public about the importance of waste reduction, recycling, and proper disposal fosters individual responsibility and promotes environmentally conscious behavior. Community-led cleanup efforts, recycling programs, and waste segregation campaigns empower citizens to take action and contribute to a cleaner, healthier environment.

Policy and Regulation

Government Role

Organic waste diversion offers policies and incentives for increasing diversion rates, tools and resources for evaluating organic waste management for communities and are funded by state and federal programs

International Standards

The EPA lays out a path to meet EPA'S national goal of reducing food loss and waste 50% by 2030. That is only 5 years away! This program is part of that effort and is funded by the U.S.D.A.



Conclusion

Currently, the linear system (one way) follows a path from producer to market to consumer, ending in a landfill. This process wastes energy and generates greenhouse gases that can be up to 80 times more potent than carbon dioxide once in the landfill. we want a circular system that keeps our resources at home making a tangible difference locally.



As the world warms, we urgently seek ways to recover from past behaviors and maintain a balanced system. A closed-loop system moves from producer to market to consumer, then to compost, and finally returns organic matter back to the producer raising soil value. examples include water holding capacity, microbiology, nutrients, minerals, increases cation exchange, less inputs more outputs!



Q&A Session



SCAN ME



<https://ctuir.org/departments/natural-resources/climate-adaptation/nixyaawii-awku-c-a-wpam-a-k-aatta-nixyaawii-don-t-throw-it-away-project/>

Contact Info and Thanks!

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This material is based upon work supported by the U.S. Department of Agriculture, under agreement number 2024-70510-41990.

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**ZERO
WASTE**

The background image shows a close-up of hands peeling green vegetables, likely asparagus, in a large white plastic tub. The person peeling is wearing a blue shirt with a colorful floral pattern. Another person's hands are visible in the background, also working with the vegetables. The scene is brightly lit, and the focus is on the hands and the vegetables.

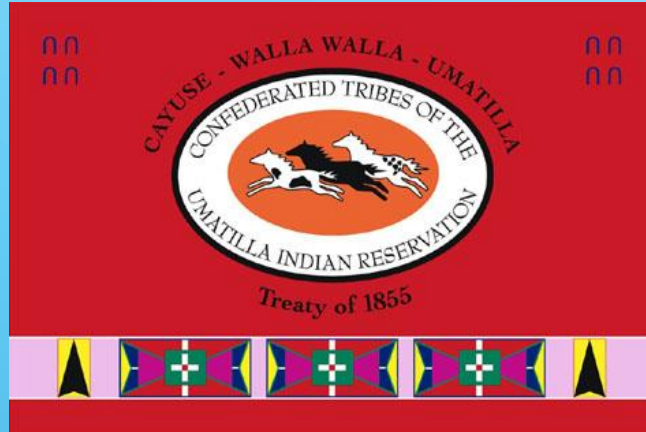
Nixyaawii, Awkú Čáwpam Ákaatta!

“Nixyaawii, Don’t Throw it Away!” Project

BOT Update & Resolution to Support

Friday Oct 25th 2024

Prepared by First Foods Policy Program



Thank you to Project Funders!

USDA Composting and Food Waste Reduction Program

- National Institute for Food and Agriculture (NIFA)
- Office of Urban Agriculture and Innovative Production (OUAIP)
- Natural Resource Conservation Service (NRCS)



Meyer Memorial Trust (MMT)
Bureau of Indian Affairs (BIA)
Amazon Change X

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First Foods Policy Program



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Ermia Butler
Climate Change Intern

Biowaste Technology



DeArcie Abraham
Primary Operator

Project Goals

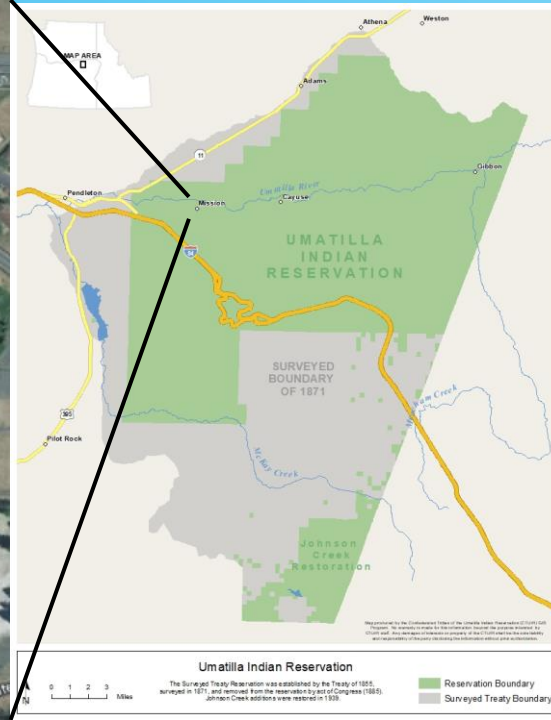
- 1) Understand food waste types and volumes
- 2) Build community capacity to improve materials management
- 3) Implement research/demonstration effort for biogas using food waste





Nixyaawii: “The Good Place”

Mission, or Nixyaawii, is the biggest population center with housing, government services & cultural/religious space (Longhouse)



This is the focus of our project, to engage Tribal community in skills and planning

Learn more about food waste on a small scale to understand how this could be scaled up

Goal 1: Understand Food Waste

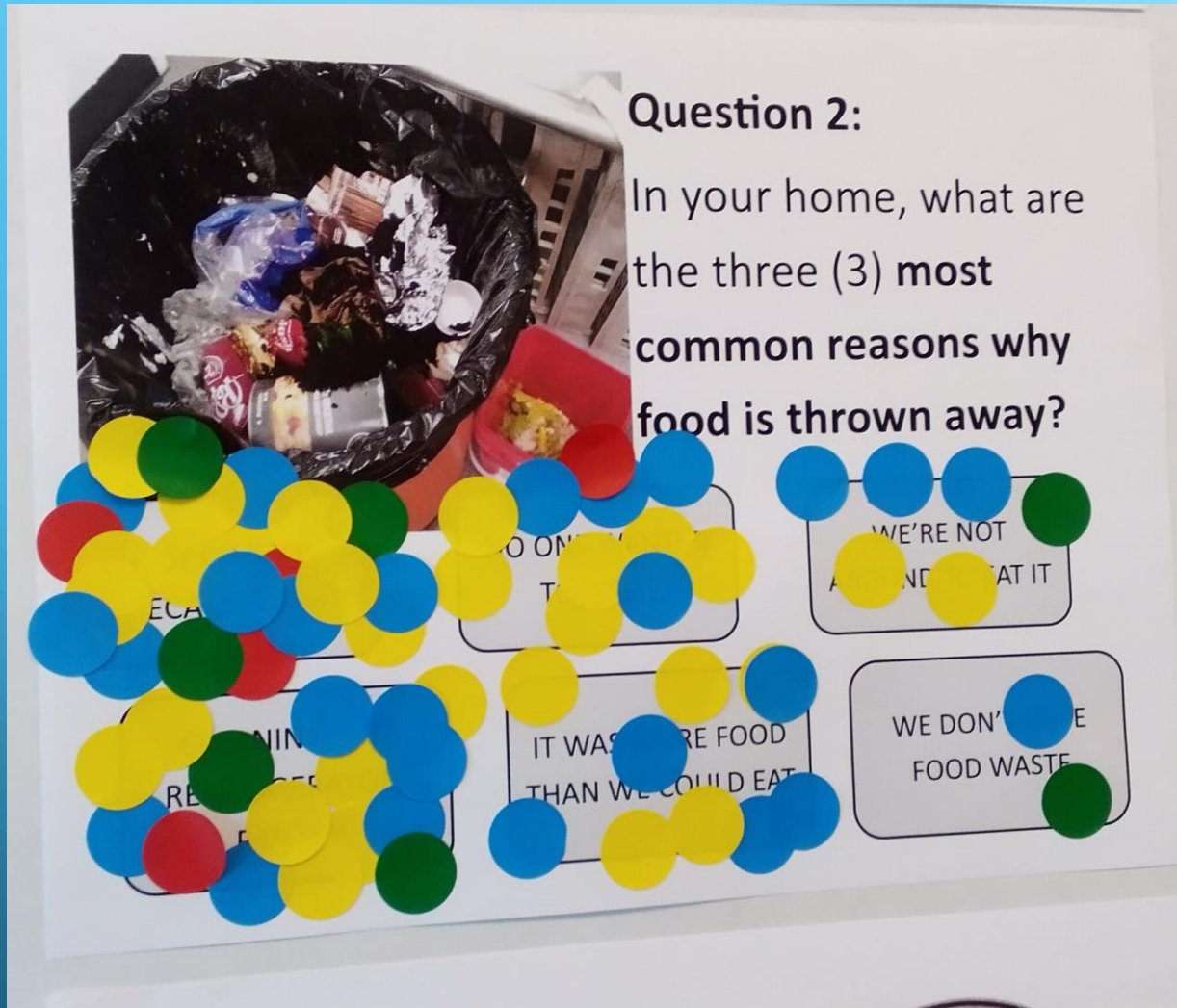
Understand TYPES and QUANTITY of waste generally, and food waste specifically

Our project will generate information through

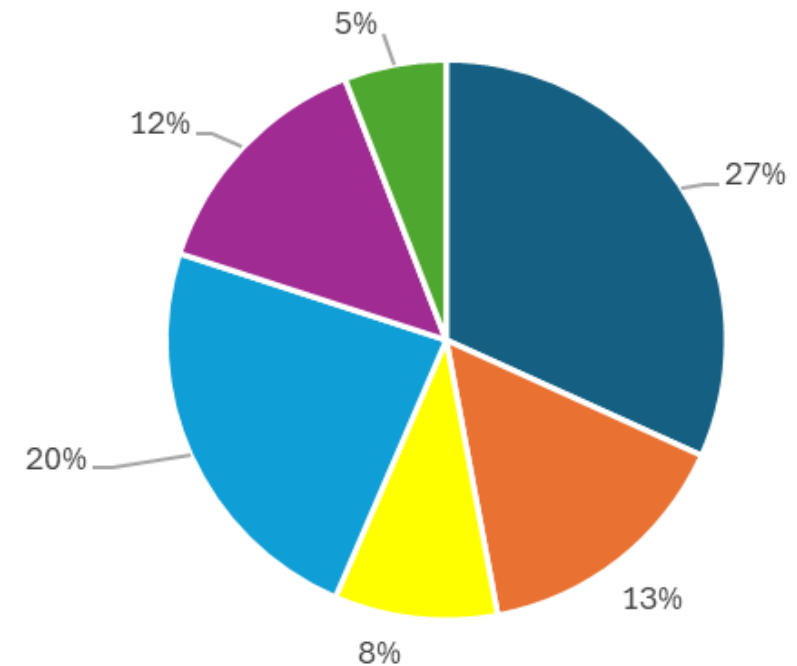
- 1) community behavior survey (pictured), and
- 2) Host site waste audits



Community Survey – Preliminary Results



Question 2 : In your home, what are three most common reasons why food is thrown away?



■ Became Spoiled/Stale ■ No One Wants to Eat It ■ Not Around to Eat It
■ Cleaning Out ■ Too Much to Eat ■ No Food Wasted

Goal 2: Build Community Capacity

Expand Tribal community 'capacity' to improve materials management, include food waste

Our project will build capacity through

- 1) Supporting Tribal member certification & knowledge (pictured)
- 2) Community training and educational events



Upcoming Project Events

We have several events coming up where we will provide project information and materials management trainings

- **Sat Nov 9th:** Whitman First Foods Festival presentation ~3 PM
- **Sat Nov 16th :** Longhouse Training (open to public)
- **Sat Nov 26th:** Longhouse Training (cooks and staff)
- **Past event:** Pilot Rock 8th & 9th graders waste audit (pictured)



Goal 3: Research/Demo Biogas

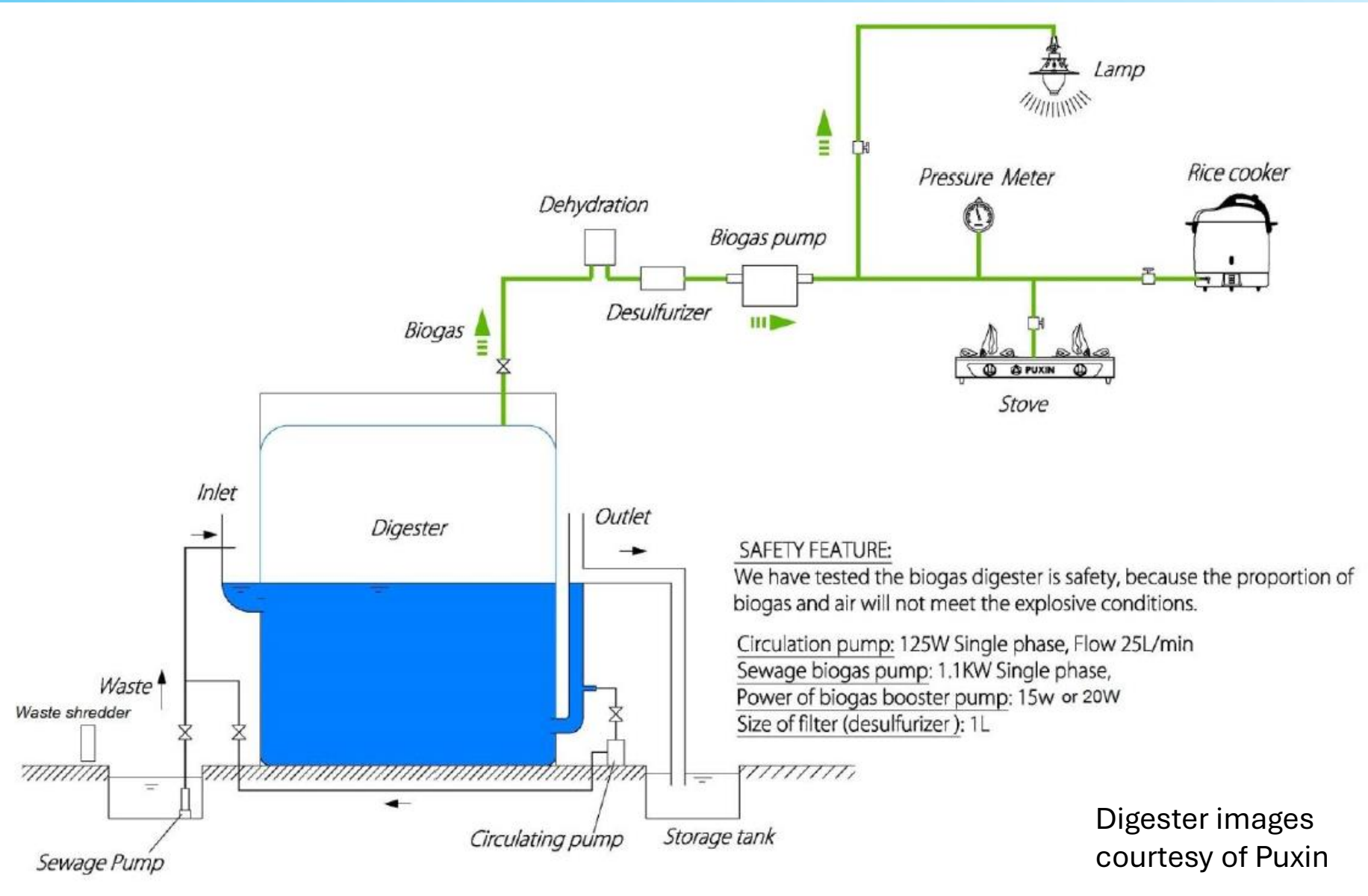
Methane is a 'renewable natural gas' like propane, and can be generated from many kinds of feed stock

What is the potential for renewably generated methane to be a tool in the Tribe's energy toolbox?

Research a small scale operation with an eye towards scaling up



Can Biogas Work for Our Community?



Project Infrastructure Needed



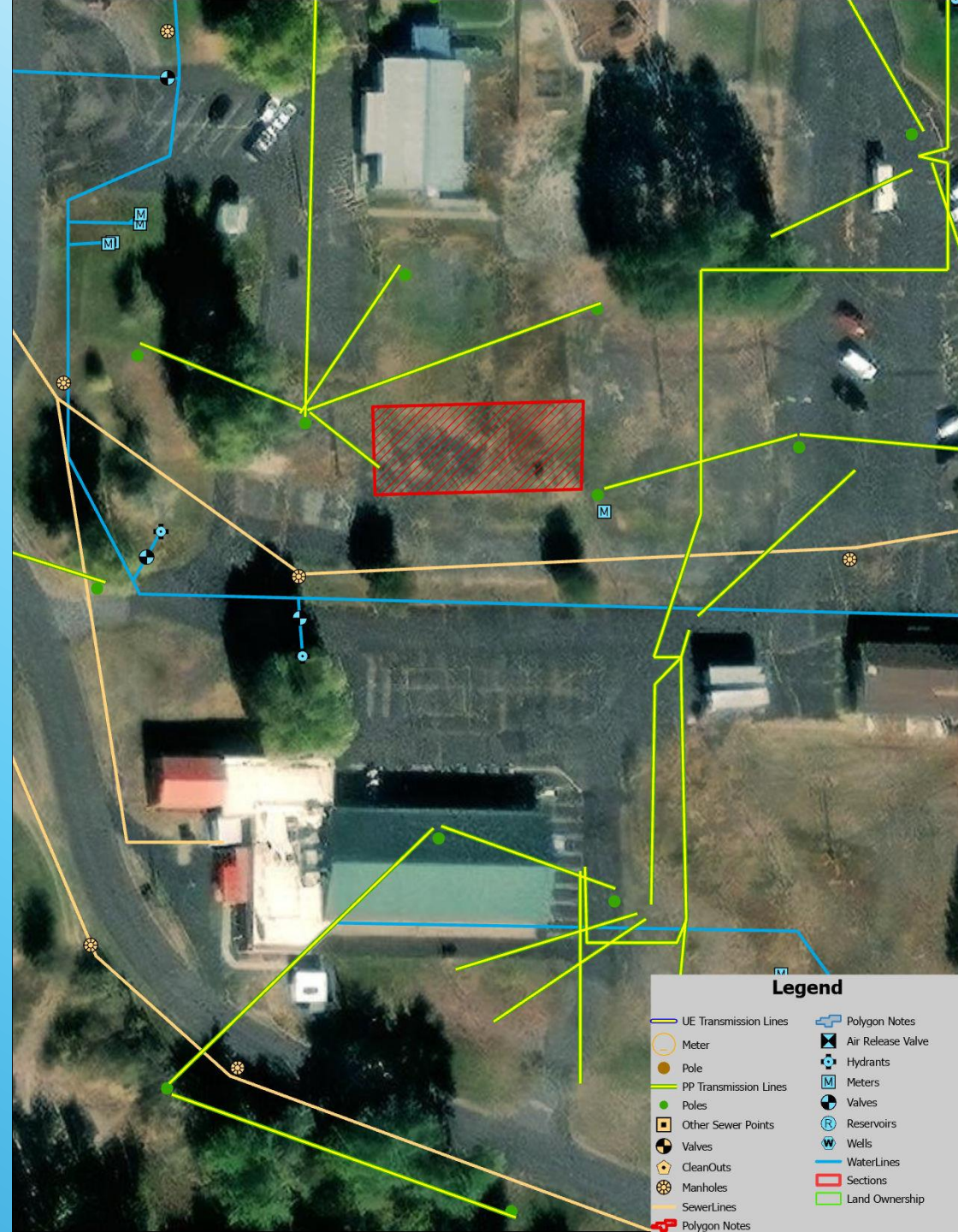
Permit Process in Progress

Discussions with Public Works and Tribal Planning

Commission and Committee preliminary support for shed

THPO request submitted Oct 16

Trust land so Tribal Resolution of permission is required





Opportunities

- Close loop for First Foods & cultural connection
- Diverse energy production opportunities that center Tribal community self determination
- Carbon capture potential for carbon market/credits

Concerns

- Methane – odor and flammability/explosivity, AQ & VOC's
- Flooding -- storm water contamination
- Health & safety -- Human interference and attracting wildlife
- Temperature -- generation potential in heat but not in cold



Excited for what we will learn!

VERY early in project

- Model Free, Prior and Informed Consent for Energy Planning
- RNG for diversified Tribal Microgrids
- Baseload potential for Snake/Columbia River Dam discussion



Thanks to our Project Team

Biowaste Technology

DeArcie Abraham, Operator

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Colleen Sanders, Project Co-Director

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Nixyaawii Longhouse cooks and Gatherers

CTUIR Science & Technology Committee

CTUIR Fish & Wildlife Commission

CTUIR Cultural Resource Committee

CTUIR Land Protection and Planning Commission

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Mike McHenry, Pendleton Sanitary Service Inc.

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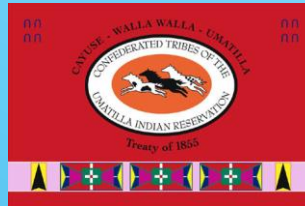


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