

# out think the box

## Ecosan Dry Toilet System for W. Oakland, CA

*Prepared for the Wood Street Commons*

8 September 2024



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Recommended Citation  
"Ecosan Dry Toilet System for W. Oakland, CA" (2024)

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Presentation number :  
02-2024 Oakland, CA USA  
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# who - kimberly (kim) king

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## Titles, Credentials and Certifications

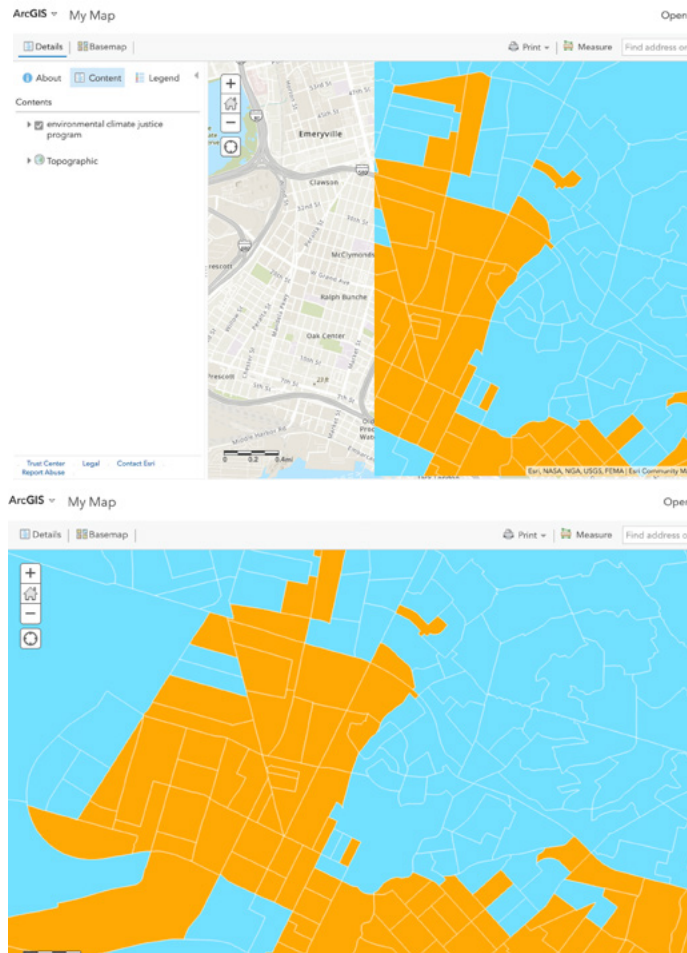
<https://www.linkedin.com/in/kimgerly/>



- Ecosanitation Expert
- Project Engineer
- Applicable Credentials and Certifications
  - 1994 - 1995 | Johns Hopkins University, Environmental and Health Engineering (Graduate Studies Coursework in Solid & Hazardous Waste Management)
  - 2002 - 2003 | 40-Hour Hazardous Waste Operations and Emergency Response Operator
  - 2015 - Present | OSHA 30 Hour Training
  - 2018 - Present | Ecole Polytechnique Fédérale de Lausanne (EPFL), Planning and Design of Sanitation Systems and Technologies
  - 2019 - Present | Technical Advisor, US TAG to ISO/PC 318 Community scale resource oriented sanitation treatment systems

# who - epa grant service audience & background

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## Definitions

EPA - Environmental Protection Agency  
IRA - Investment Reduction Act

## Communities in the EPA IRA Disadvantaged Community Map in West Oakland, CA

- No matching funds required
- No cost sharing
- Track I award \$20 mil for 3 year project period

**EPA Environmental Climate Justice Map:** <https://bit.ly/4dNbzEq>

**Federal Agency and Office:** U.S. Environmental Protection Agency, Office of Environmental Justice and External Civil Rights (OEJECR)

**Funding Opportunity Title :** [Environmental and Climate Justice Community Change Grants Program](#)

**Funding Opportunity Number:** EPA-R-OEJECR-OCS-23-04C

# who - curbside communities 5



## Wood Street Commons strengths:

- Community building
- Stakeholder outreach
- Harm reduction & healing
- Food & clothing distribution
- Safe sleeping space
- Leadership training

*Homeless Helping Homeless... All or None*  
<https://woodstreetcommons.org/>

# what - to consider

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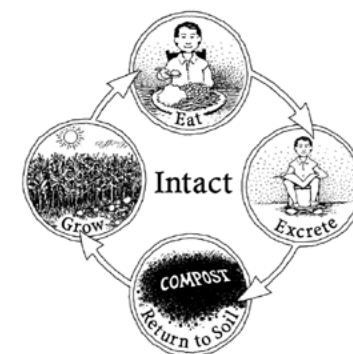
COMPARED TO  
EXPENSIVE PORTA  
POTTIES

How can a more dignified,  
cost-effective, safe,  
neighborhood-friendly  
sanitation service be  
accessed by curbside  
communities while they wait  
12-24-36-48 months for more  
truly affordable housing to  
become available?

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Prepare. Respond. Adapt.

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**Definition:** *Ecological sanitation (eco-san) Safely close the loop  
between sanitation and agriculture.*



# what - performance based 7 eco-san service project

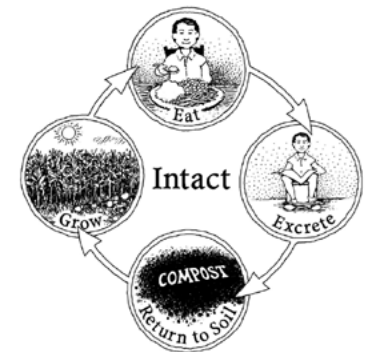
## COMPARED TO FLUSH TOILETS

- Destroys pathogens
- Safe and secure
- Conserves water
- Retains nutrients
- Free of odors and vermin
- Takes stress off the municipality
- See [Restorative Sanitation](#)

Out think the box.  
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**Definition:** Ecological sanitation (eco-san) Safely close the loop between sanitation and agriculture.



# what - ecosan dry toilet

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## ONE SOLUTION

## Community ecosan dry toilet processor system

### Kailash EcoVillage

- First of it's kind in the USA
- Accommodates ~50 persons
- 2019 [IWA Research Paper](#)
- 2019 [SE PDX Permit](#)

[VIDEO - Go to 24:08] <https://bit.ly/3XeaK0w>

Composting Processor	Features
Bins (9 count, 3 modules)	<b>DIMENSIONS</b> <ul style="list-style-type: none"><li>• Exterior (~25' x 19')</li><li>• Interior (48" x 48" x 48" ~2.4 yards<sup>3</sup>)</li></ul> <b>WALLS</b> <ul style="list-style-type: none"><li>• Durable, low-cost, 8" x 8" x 16" concrete blocks (insulation)</li><li>• Vermin proof</li><li>• Wooden sill plate for roof support (located on top of walls)</li></ul> <b>BOTTOM</b> <ul style="list-style-type: none"><li>• Sloped concrete pad (4" above pad perimeter lip)</li><li>• Waterproof</li><li>• Center drain grate (leachate collection)</li></ul> <b>ROOF ASSEMBLY (sloped)</b> <ul style="list-style-type: none"><li>• Corrugated, galvanized steel</li><li>• Rain accumulation prevention</li><li>• Vermin mitigation</li><li>• Hinged</li><li>• 3-bin module shares a common roof</li><li>• No electricity, water, plumbing connections required</li></ul>
Sump Area (Plumbing)	Leachate collection includes drain grate, sump barrel, sump lid; 2" ABS piping with 1/4" per foot slope, 2" ABS fittings; Contamination prevention of local soil and groundwater
Ventilation	Wire mesh screen air vent (hardware cloth); Vermin and insect management; ~70 in <sup>2</sup>
Security	Gated courtyard (hinged and latched)





# what - other ecosan systems 9

Some ecosan systems designed in California & Texas:

*\* Denotes installed and executed*

- 2 users - Amador Ranch (Pioneer, CA)\*
- 2-6 users - Hucklebilly Ranch (Big Sur, CA)\*
- 2-10 users - Monastery (Kelseyville, CA)\*
- 10 users - Sanctuary (Brooks, CA)\*
- 20 users - Here/There Encampment (Berkeley, CA)
- 20+ users - Habitable Spaces (Kingsbury, TX)\*



# why - the opportunity

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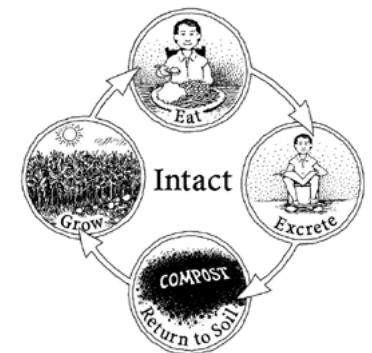
72 HOURS AFTER AN EARTHQUAKE WHAT WILL CITIZENS DO WHEN CAN'T FLUSH THEIR TOILETS?

California is attuned to earthquake readiness, but lacks:

- A robust, resilient, redundant approach to sanitation infrastructure

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- A short-term project for curbside communities to...
- ...inform a long-term disaster sanitation strategy
- An ecosan system accommodating community management and small business development

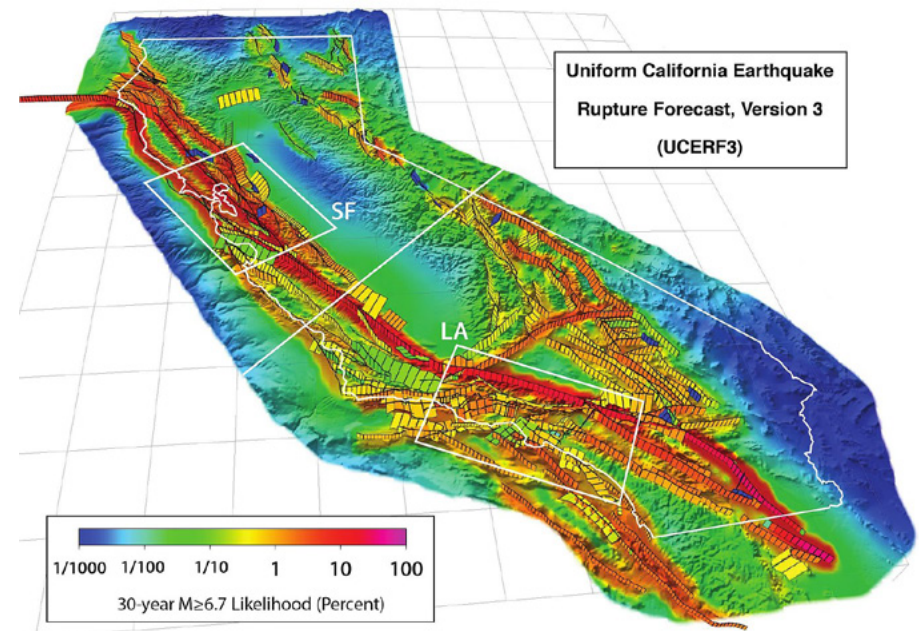


# why - the other 'drought'

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Pacific Rim (USA West Coast) mega-quakes predicted

- California's 'other drought'
- San Andreas Fault (Southern California)
- Hayward Fault (highly urbanized SF East Bay)
- SF East Bay Area is one of the **most highly densely populated areas in the world**
- 7.9 magnitude earthquake AK Kodiak Island (23Jan18)



California's major faults. The 3rd Uniform California Earthquake Rupture Forecast (UCERF3) estimated probabilities. The San Andreas Fault and Hayward Fault systems are red on the likelihood scale.

*Citation:* USGS, <https://on.doi.gov/2qVm5n0>

# why - one problem

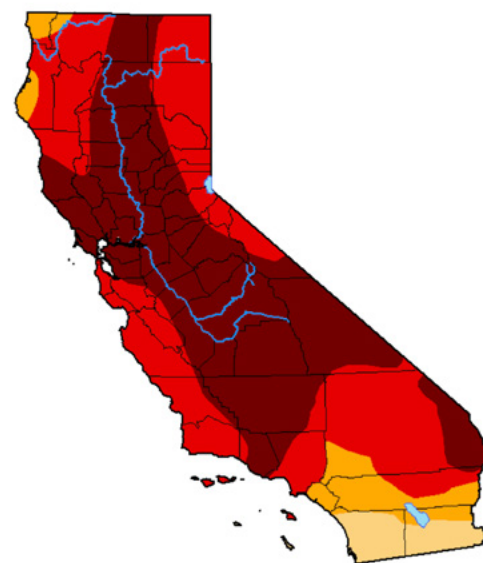
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## THE CALIFORNIA DROUGHT

17 August 2021 drought conditions (percent area)

- D1-D4 100%
- D2-D4 95.58%
- D3-D4 88.37%
- D4 48.97%
  
- D1 - Moderate
- D2 - Severe
- D3 - Extreme
- D4 - Exceptional

U.S. Drought Monitor  
California



August 17, 2021  
(Released Thursday, Aug. 19, 2021)  
Valid 8 a.m. EDT

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	95.58	88.37	48.97
Last Week 08-10-2021	0.00	100.00	100.00	95.07	88.37	47.10
3 Months Ago 05-18-2021	0.00	100.00	100.00	94.31	73.33	15.91
Start of Calendar Year 12-29-2020	0.00	100.00	95.17	74.34	33.75	1.19
Start of Water Year 09-29-2020	15.35	84.65	67.65	35.62	12.74	0.00
One Year Ago 08-18-2020	20.55	79.45	54.22	21.72	3.04	0.00

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Curtis Riganti  
National Drought Mitigation Center



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

The U.S. Drought Monitor is produced through a partnership between the National Drought Mitigation Center (University of Nebraska-Lincoln), USDA, and NOAA.

**Citation:** <https://bit.ly/3lru6Wo>

# when - track I application

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## DEADLINES

- Submission goal date to the EPA: Fri, 1 Nov 2024
- Application closing date: Thu, 21 Nov 2024 11:59 PM ET

### Track I Written Application Criterion

Section	Possible Points
<b>Part 1. Community Driven Investments for Change</b>	<b>80 total</b>
1.1 Community Overview	10
1.2 Selected Strategies	45
1.3 Community Engagement and Collaborative Governance Plan	15
1.4 Community Strength Plan	10
<b>Part 2. Program Management, Capability, and Capacity</b>	<b>35 total</b>
2.1 Performance Management Plan, Outputs / Outcomes	6
2.2 Project Linkages to the EPA Strategic Plan	4
2.3 CBO Experience and Commitment	5
2.4 Programmatic and Managerial Capability and Resources	15
2.5 Past Performance	5
<b>Part 3. Readiness to Proceed, Feasibility, and Sustainability</b>	<b>40 total</b>
3.1 Readiness Approach	8
3.2 Feasibility	9
3.3 Sustainability	5
3.4 Program Budget Description	8
3.5 Compliance Plan	10
<b>TOTAL</b>	<b>155</b>

## FUNDING TRACK I

### Community-Driven Investments for Change

#### Climate strategy

- #7 - Waste Reduction and Management to Support a Circular Economy
- #8 - Workforce Development

#### Pollution strategy

- #4 - Safe Management and Disposal of Solid and Hazardous Waste

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# how - service offering

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## SANITARY COMPOST PREPAREDNESS, RESPONSE & SERVICE OPPORTUNITY

Consider application of these EPA Strategies to avert sweeps:

- #4 - Provide 24/7 safe ecosanitation & handwashing management & disposal management (pathogens destroyed)
- #7 - Curbside communities contribute to-benefit from revenue generating opportunities (circular economy)
- #8 - Curbside community inhabitants trained & paid as ecosan humanure composting\* experts & entrepreneurs (low startup costs)

\* *Ecosan thermophilic (high-temperature/heat) humanure composting*

- 122°F (50°C) maintained in the compost pile > 1 week
- >140°F (60°C) maintained for a 24-hrs (complete pathogen die-off)

# where? - prospective sites

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## 3RD & PERALTA

- 50 inhabitants



## WOOD STREET COMMUNITY CABINS

- 100 inhabitants



## CALTRANS AIRSPACE LOT (BETWEEN 30TH & 34TH)

- ~50 safe parking spots



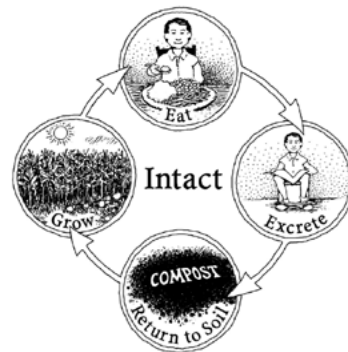


# closing note - benefits

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- ↑ Curbside community access to digified & safe sanitation
- ↑ Economic viability & empowerment
- ↑ Job opportunities
- ↑ Resiliency

- ↓ Dependency on social services agencies
- ↓ Stress on municipal H<sub>2</sub>O and sanitation infrastructure
- ↓ Unsafe outdoor defecation



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# resources & references

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*Community Dry Toilet and Urine Diversion  
System Using IAPMO WE•Stand © 2018*

*Sanitary Compost Preparedness, Response  
& Service Opportunity, 31 Aug 2018*

*Research Article IWA Blue-Green Systems  
Online Vol 1, No 1, 30 July 2019*

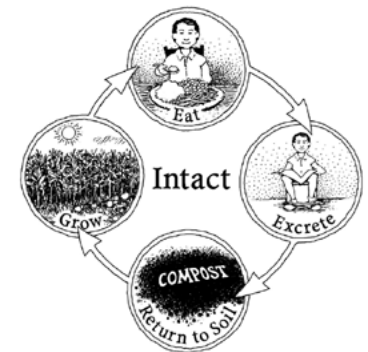
*City of Oakland, CA, Notice of  
Qualification, 2 Feb 2022*

*Restorative Sanitation Panels*



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