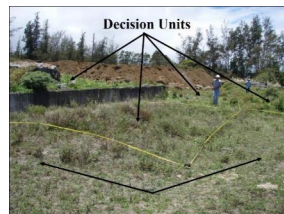
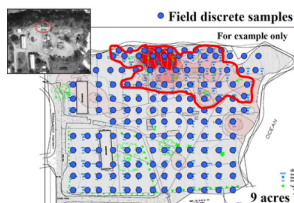


## Environmental Investigation and Redevelopment of “Brownfield” Sites in Hawai‘i



**Roger Brewer (Senior Scientist - Honolulu)**

**Department of Health  
Hazard Evaluation & Emergency Response  
Brownfields Conference  
Maui July 2018**

## Know Before you Dig... Unexpected Delays Can Cause BIG Problems



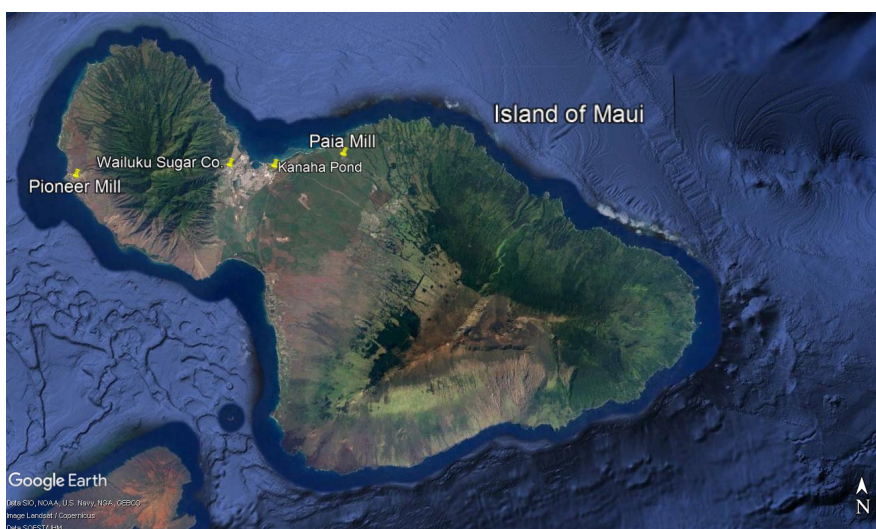
# Environmental Hazard Management Plans (EHMP)

## Three types of EHMPs

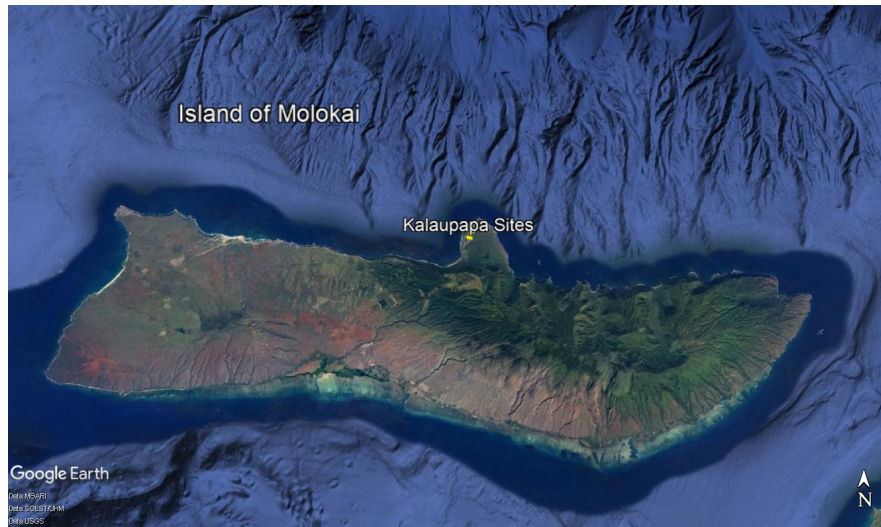
1. Areawide
2. Site-specific
3. Pre-construction

3

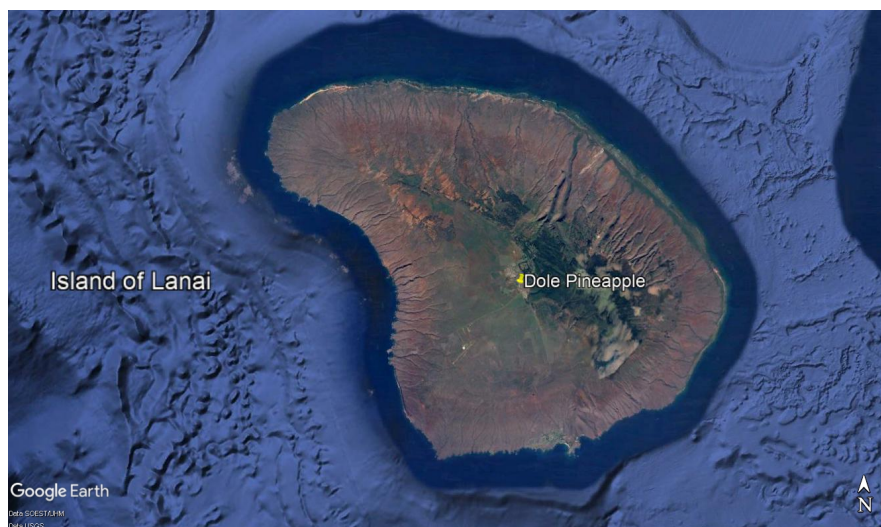
## Sites in Maui County Tested by the HEER Office



### Sites in Maui County Tested by the HEER Office



### Sites in Maui County Tested by the HEER Office



## Former Molokai Electric Company



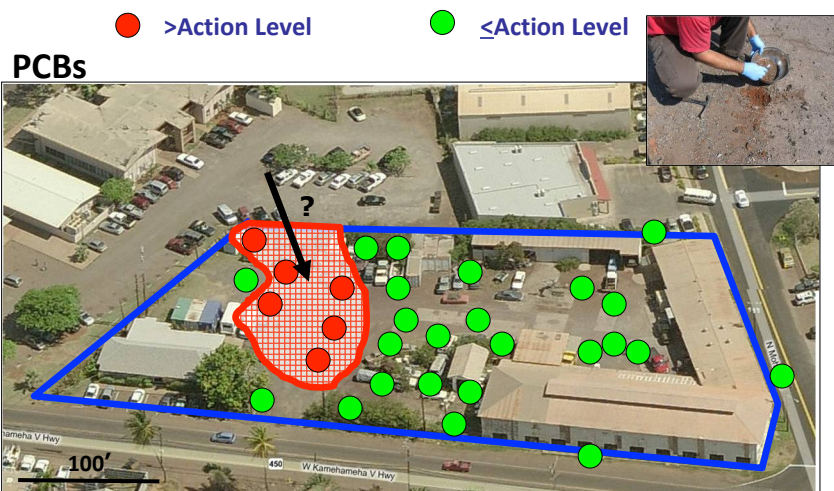
- **Operated 1932 to 1983;**
- **Potential Contamination: Petroleum and PCBs.**

## Former Molokai Electric Company Proposed Community Center

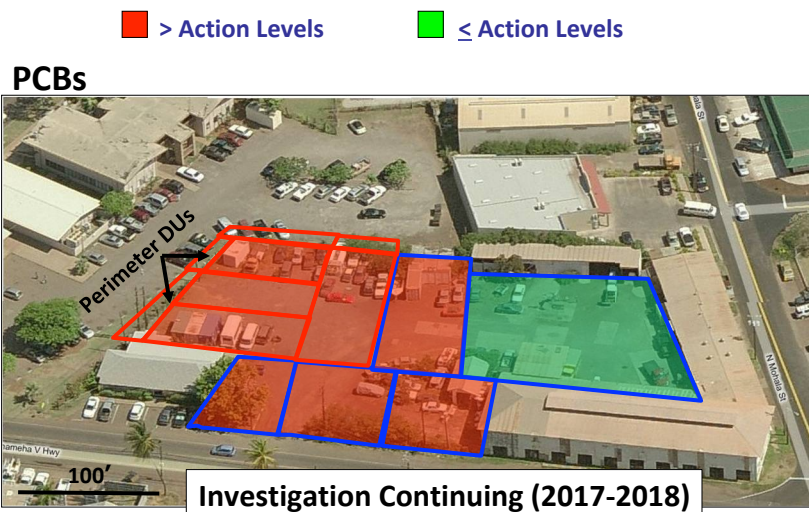




## Former Molokai Electric Company Initial Soil Testing (Old Methods)

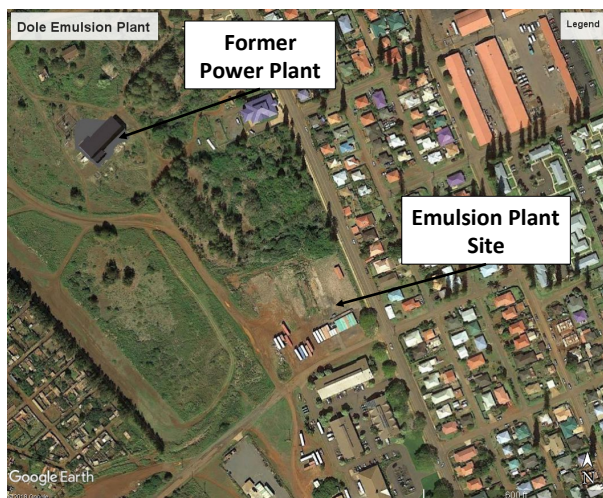


## Former Molokai Electric Company Additional Soil Testing (New Methods)



After ITRC (2014)

## Former Pineapple Pesticide “Emulsion Plant” Lanai City



## Former Pineapple Pesticide “Emulsion Plant” Lanai City



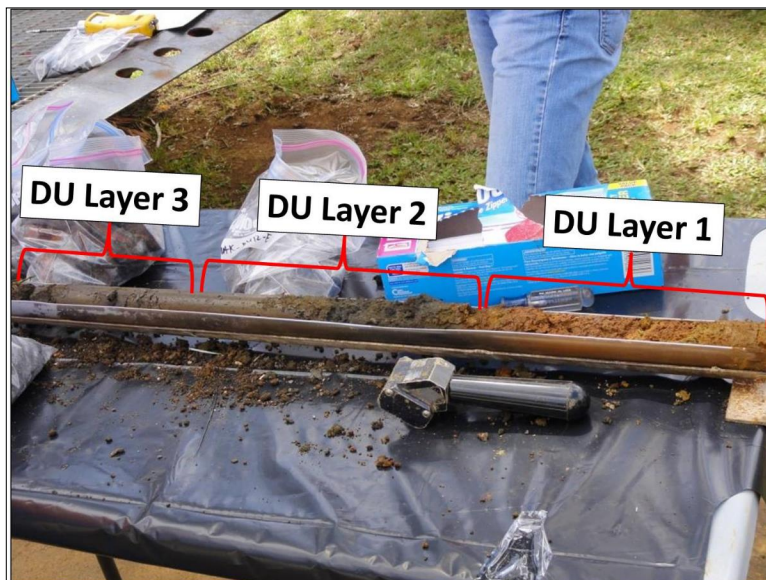
- **Planned redevelopment;**
- **Past pesticide mixing and underground chemical storage tanks;**
- **Moderate soil contamination with fumigants and dioxins;**
- **Remediation plans being prepared.**

## Testing of Deep Soil (different site)



13

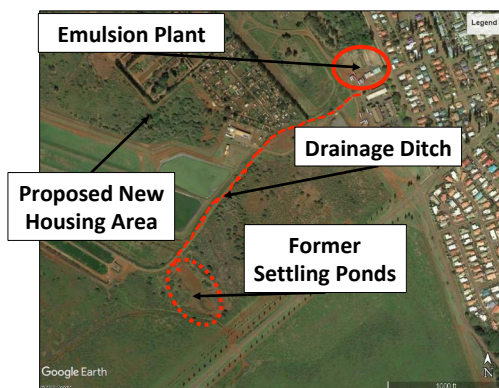
## Testing of Deep Soil



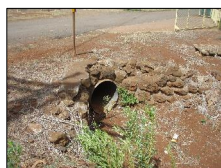
4



## HEER Office Testing of Drainage Areas



- Only trace contamination identified in ditch and settling ponds;
- Well below levels of potential concern;
- No significant pesticides identified in nearby pineapple field;
- Proposed adjacent, housing redevelopment



## Testing of Former Sugar Mills





## Main Concern: Former Pesticide Mixing Areas

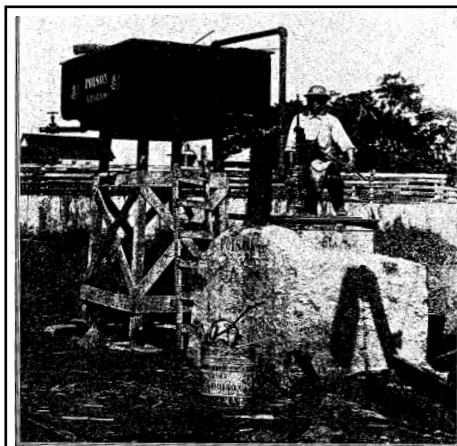


Fig. 2. Boiler and Tank for Stock Solution at Kilauea. The solution is pumped with the small hand pump from the boiler into the tank whence it runs by gravity into the Supply Tanks or other conveyances.

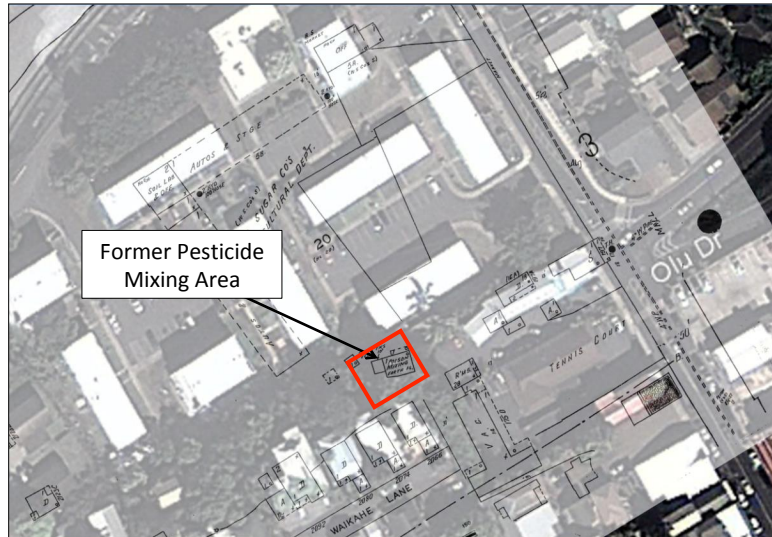
### Weed Control:

- 1910s-1930s: Arsenic
- 1930s-1960s: PCP (pentachlorophenol, contained dioxins)
- 1970s-1990s: Triazines (degradable, less toxic).

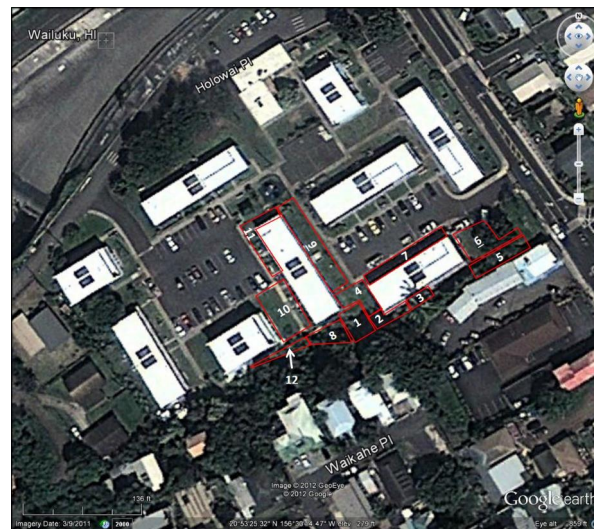
## Kahekili Terrace Former Wailuku Sugar Company



## Former Wailuku Sugar Company (Kahekili Terrace)



## Kahekili Terrace Initial HEER Office Soil Testing



## Sampling and Testing of Exposed Soil



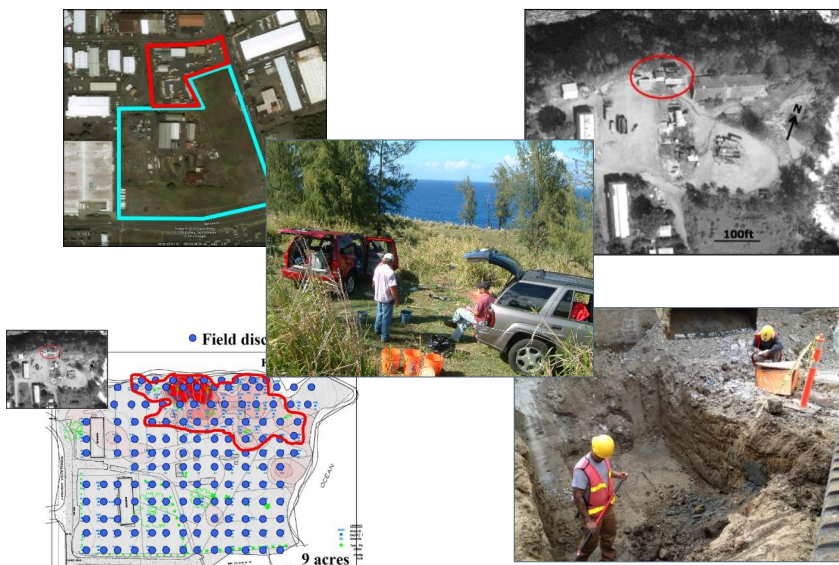
## Additional Testing in 2017



- Moderate contamination identified in some areas;
- Bare areas covered;
- Maintain lawns and practice good hygiene;
- Long-term remediation plan under development



## Questions?



## What do these terms mean?

**Phase 1** – What happen in the past?

**Phase 2** – How bad is it and how far does it go?

**Remedial Alternatives Analysis** – What's the best thing to do about the problem?

**Response Action Memorandum** – This is what we're going to do about it

**Remedial Action Completion Report** – I did what I said I was going to do and this is what's left

**No Further Action (unrestricted)** – I can build on it and use it however I want to

**No Further Action with Institutional Controls** – I can use it as long as I follow the guidance the HDOH gives me.

## **Areawide EHMPs**

- **Assumes widespread contamination over a large area (e.g., harbors, fuel terminals, etc.);**
- **Assumes that contamination will be encountered during construction work;**
- **Provides basic information for management of contaminated soil and groundwater disturbed during future site work;**
- **Covers common/public areas that have not been investigated (e.g.-streets);**
- **Is designed to protect public utility and construction workers from contamination in nearby areas.**

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## **Site-specific EHMP**

- **Any remaining areas of contamination identified and managed in place;**
- **EHMP provides basic information for management of contaminated soil and groundwater disturbed during future site work;**
- **May involve either an engineering (caps, etc.) or administrative control (restrictions on use of property, etc.).**

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## **Pre-Construction EHMPs**

- **Is more detailed and activity specific (e.g.,- digging);**
- **Applies to areas where the investigation is ongoing concurrently or has not gone through the removal or remedial process;**
- **Is based on the assumption that contamination will be encountered via certain activities on-site;**
- **Is designed primarily to protect site workers and ensure that contaminated soil and groundwater are dealt with appropriately during construction work.**