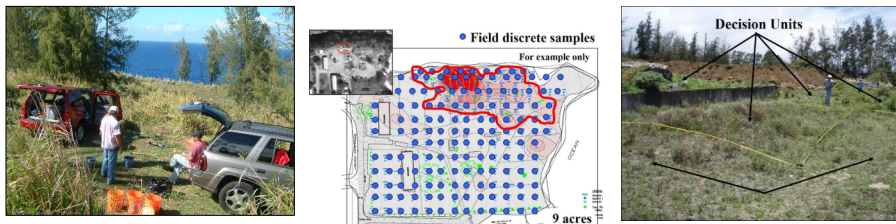


Environmental Investigation and Redevelopment of “Brownfield” Sites in Hawai‘i



Roger Brewer (Senior Scientist - Honolulu)

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

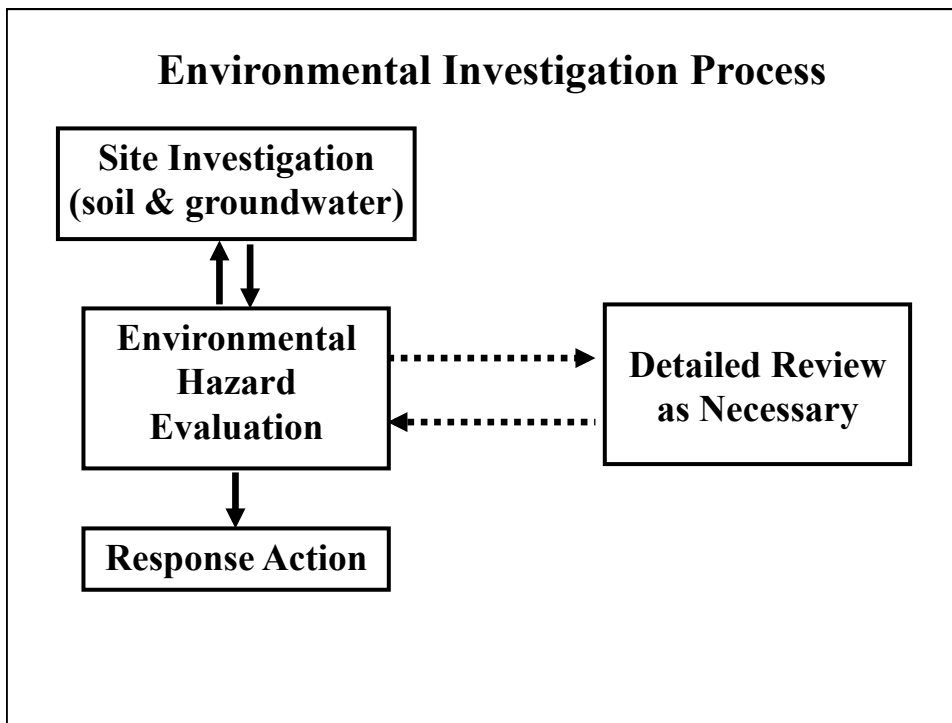
Hawai‘i Department of Health

Solid & Hazardous Waste Branch:

- Underground storage tanks;
- Illegal dumps;
- Permitted hazardous waste facilities.

Hazard Evaluation and Emergency Response

- Everything else;
- Former industrial properties;
- Tank farms;
- Pesticides, etc.



Hawai'i DOH Guidance for the Investigation, Cleanup and Management of Contaminated Properties

1. Testing Soil, Water and Air for Contamination:

Technical Guidance Manual: Hazard Evaluation and Emergency Response: <http://eha-web.doh.hawaii.gov/eha-cma/Org/HEER/>

2. Determining if There is a Problem:

Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater:

<http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/EALs>

3. Long-Term Management:

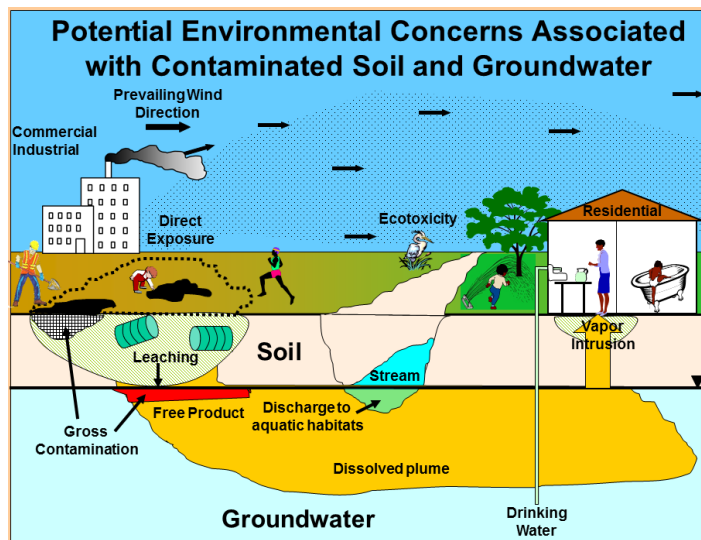
Long-Term Management of Petroleum-Contaminated Soil and Groundwater: <http://www.hawaiidoh.org/>

HEER OFFICE TECHNICAL GUIDANCE MANUAL

- Site history review;
- Investigation design;
- Sample collection and testing;
- Identification of potential environmental concerns;
- Remediation +/- long-term management.



Environmental Hazards Posed by Contaminated Soil and Groundwater



Environmental Hazard Evaluation - Something for Everyone -

- Chemistry: What is it?
- Geology: Where is it?
- Physics: Where is it going?
- Toxicology: Can it harm me?
- Ecology: Can it harm ecological habitats?
- Combined: What are the concerns?
- Engineering: What can be done?
- Lawyers: Who's going to pay for it?

HDOH Environmental Action Levels

- Concentration of a chemical in soil, water or air that does not pose a significant health risk
- EAL not exceeded? No Further Action
- EAL Exceeded? Further evaluation necessary

Environmental Action Levels Surfer Hawai'i DOH (Fall 2017)



Worksheet is write protected. Disable protection using
"Unprotect" under "Review" if you have trouble
selecting options (password = EAL).

Steps 1 and 2:

Click in cell and use pull-down boxes to make selection.

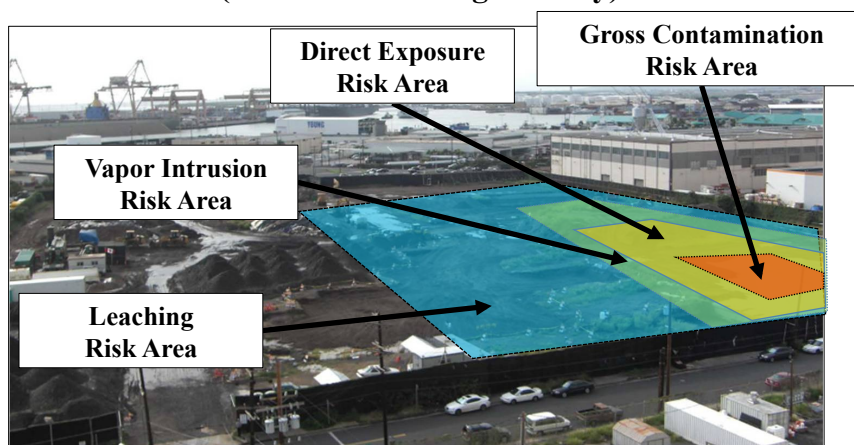
STEP 1: Select 'Site Scenario:		ARSENIC
² Land Use:	Unrestricted	Final EALs Soil (mg/kg): 2.4E+01 Groundwater (ug/L): 1.0E+01 Soil Vapor (ug/m ³): -
³ Groundwater Utility:	Drinking Water Resource	
⁴ Distance To Nearest Surface Water Body:	< 150m	
STEP 2: ⁵ Select Contaminant		
Chemical Name or CAS #?	Chemical Name	
ARSENIC		

Ranking of Soil Contamination

Soil Category	Actions
Category A (Natural Background)	No action required
Category B (Trace Contamination)	Below levels of potential concern; no action required
Category C (Moderate Contamination)	Minimize exposure and develop long-term remediation plan
Category D (Heavy Contamination)	Cap soil and/or restrict land use and develop long-term remediation plan

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Example “Environmental Hazard Map” (former fuel storage facility)



Example Remediation and Redevelopment Design:

- Remediation of Gross Contamination and Direct Exposure, Vapor Intrusion areas prior to construction;
- Long-term monitoring and management of remaining, contaminated soil and groundwater.

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Types of No Further Action Letters

1. **No Further Action Letter (unrestricted use):**
 - Given only to sites that have all concentrations under unrestricted use Environmental Action Levels
 - A human health risk assessment indicating no hazard is present has been performed for residential use receptors
2. **No Further Action Letter with Institutional Controls:**
 - Given to sites where concentrations above unrestricted use action levels are present but controls (engineering or institutional) are in place to prevent exposure to potentially affected receptors
 - An Environmental Hazard Management Plan (EHMP) is required and outlines the controls on the site.

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Questions?

