Achieving Closure

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Closure Highlights

- More Transparent Terms
  ("Plain English" outcomes)
- More Options

Current RAO Categories Work Well, *IF…*

A-1

A-3

C-1

B-3

B-1

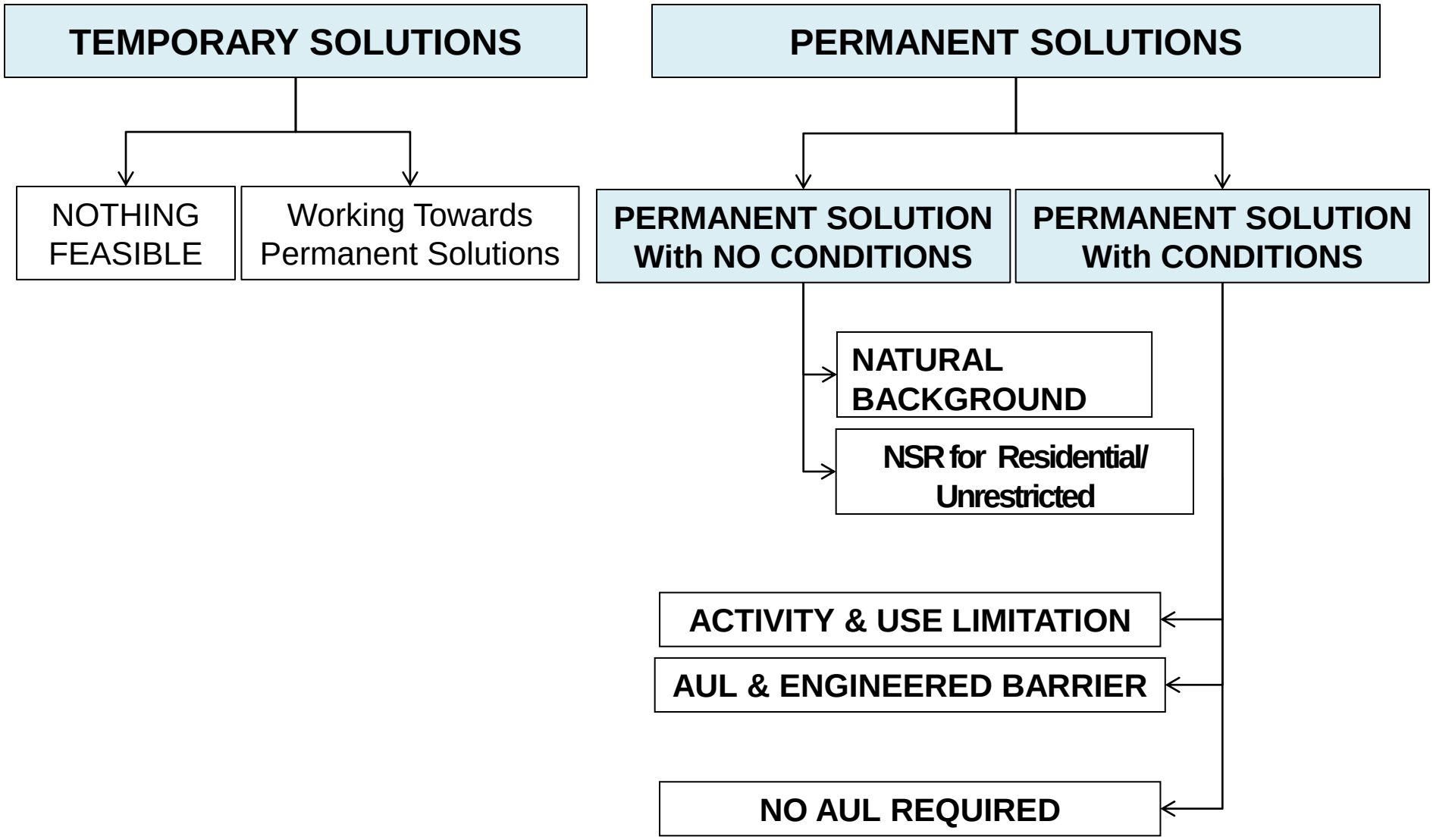
A-2

B-2

A-4

C-2

… You Know the Code!


TEMPORARY SOLUTIONS
PERMANENT SOLUTIONS
NOTHING FEASIBLE
Working Towards Permanent Solutions
PERMANENT SOLUTION With NO CONDITIONS
PERMANENT SOLUTION With CONDITIONS
NATURAL BACKGROUND
NSR for Residential/ Unrestricted
ACTIVITY & USE LIMITATION
AUL & ENGINEERED BARRIER
NO AUL REQUIRED

New Terminology!

- The Acronym:

  "RAO" is replaced by… "**POTS**" (??!?!)

- The Verb:

  To "RAO" a site becomes… To POT a site?!?

  To Solute a site??

  To Close a site?

Let's work on these some more.

Permanent Solution with Conditions
No AUL Required

1. Residual contamination within a public way or within a rail right-of-way
2. Non-commercial gardening in residential settings addressed qualitatively & recommending BMPs
3. Elevated OHM attributable to Anthropogenic Background
4. Absence of an occupied building, but OHM in groundwater greater than GW-2 levels (future VI concern)

310 CMR 40.1013

Permanent Solution with Conditions No AUL Required

- Makes you ask... "*What Conditions*?"
- Label intended to flag concerns related to residual contamination
- Assumes easy & known access to MassDEP files, both at time of closure and into the future

1. Residual contamination within a public way or within a rail right-of-way

- Currently no AUL is required for this condition.
- Current RAO category would depend on other conditions of the site.
- Currently could be part of an A-2 RAO, implying “unrestricted use” even though elevated concentrations remain

310 CMR 40.1013(1)(c)

2. Gardening Related Amendments

- Produce consumption pathway removed from calculation of Method 1 Standards
- Quantitative risk assessment of gardening pathway not required (conditionally)
- Allow use of “assumed future practices, controls or conditions” for *limited specified* circumstances (gardening)

2. Gardening Related Amendments

- MCP would require *recommendation* of gardening BMPs **in Permanent Solution closure statement**
- Quantitative assessment would still be available to screen out pathway

2. Gardening Related Amendments New Definition

Best Management Practices for Non-Commercial Gardening means current practices generally accepted by practitioners of safe gardening methods that limit potential human exposure to OHM during gardening activities and as the result of consumption of fruits and vegetables grown in a non-commercial garden. Such practices include, but are not limited to: locating garden beds outside of areas affected by releases of OHM; gardening in raised beds above a barrier layer; use of soil and soil amendments unaffected by releases of OHM in garden beds; and covering adjacent areas to limit the transfer of OHM from windborne material into garden beds.

Gardening BMPs

- Use of BMPs for gardening is becoming more widely recognized and promoted, particularly in urban areas
- Promotion of BMPs for gardening is becoming more common for *non-MCP* issues, like lead paint, pesticides
- By incorporating BMP recommendation into Permanent Solution documentation, MassDEP aims to make property owners are AWARE of issue… use of BMPs then becomes an *informed choice*.

So, What Are the Recommended BMPs?

Other People's Information

We don't have to… don't want to…

reinvent the wheel or BMPs…

just Google® it

+Paul Search Images Maps Play YouTube News Gmail Drive Calendar More

gardening BMPs soil contamination

Web Images Maps Shopping More Search tools

About 4,490,000 results (0.61 seconds)

Scholarly articles for **gardening BMPs soil contamination**

Safe - Martin - Cited by 63

Contamination of **soil** and groundwater due to … - Weiss - Cited by 5

Assessing the Educational Needs of Urban **Gardeners** and Farmers ...

www.joe.org/joe/2013february/a10.php

Our results suggest that urban **gardeners** and farmers need and want information ... Humans may be exposed to **soil contaminants** through three main pathways: .... resources on **best management practices** (**BMPs**) when **soil contamination** is ...

Projects - Cornell University Agricultural Experiment Station

cuaes.cornell.edu › CUAES › Operations › Dilmun Hill Student Farm

Description: The Market **Garden** at Dilmun Hill has been the primary project on ... 2011/12 Final Report: **Best Management Practices** for **Contaminated Soil** (pdf) ...

[PDF] **Best Management Practices** for **Contaminated Soil** - Cornell

MassDEP

MARYLAND COOPERATIVE EXTENSION
UNIVERSITY OF MARYLAND
COLLEGE PARK • EASTERN SHORE

HOME & GARDEN

HOME AND GARDEN INFORMATION CENTER • 12005 HOMEWOOD ROAD • ELLICOTT CITY, MD 21042 • 1-800-342-2507

Home & Garden Mimeo # HG18

Lead in Garden Soils

INTRODUCTION

We don't usually think of our gardens as dangerous or toxic, but unfortunately, some garden soils do contain moderate to very high levels of lead. Garden soils contaminated with lead pose a serious health risk. The risk is primarily from contaminated soil brought into the home on clothing, shoes and tools. The soil becomes mixed with housedust that is inhaled or ingested. This can result in dangerous increases in blood lead levels, particularly in infants and toddlers. Lead may also be ingested from contaminated soil clinging to vegetable crops. However, lead uptake by plant roots and deposition in edible plant parts is very low, even when soils have a very high lead content.

SOURCES OF LEAD

SOIL TESTING

Testing for lead will help to evaluate the health. The risk is based on exposure. B university soil test labs can determine lea However, no legal regulations for soil lea

Soil laboratory results will be returned lis million (ppm) of lead from either an extr test, or both. Pay careful attention to the The values in Table 1 will help you und results.

Table 1.
Soil Lead Levels

EPA
EPA/542/F-10/011

REUSING POTENTIALLY CONTAMINATED LANDSCAPES:

Growing Gardens in Urban Soils

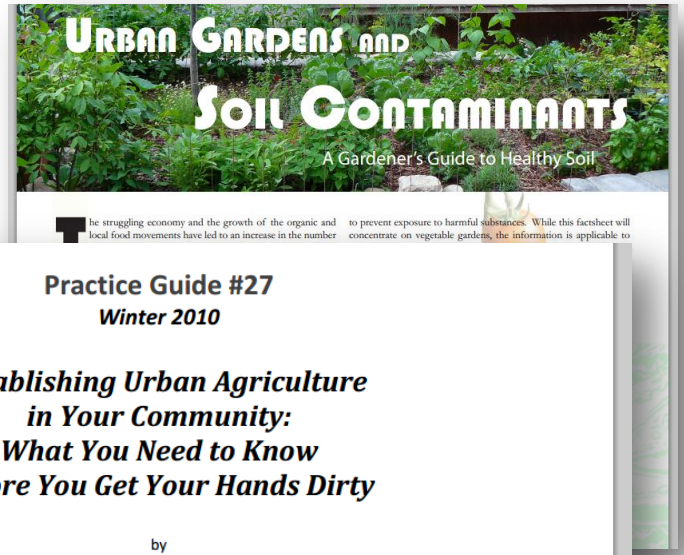
This fact sheet provides communities and individuals with general urban gardening information about:

- Common contaminants that can be found in urban soil.
- Ways to identify contaminants and reduce exposure.
- Improving soils and growing plants in mildly contaminated soil.
- Additional resources and technical assistance.

Introduction

Communities throughout the country are turning to urban agriculture and gardening as a reasonable option to increase their access to healthy, nutritious, and low-cost produce. Some of the sites that communities are using for urban gardens were previously home to industrial and commercial operations. A garden on abandoned land can become a new community asset by improving the visual look

More information f
gardener on soil s
amendments, plants,
and their health e
additional links is ava
CLU-IN website: ww
ecotools/urbanga



he struggling economy and the growth of the organic and local food movements have led to an increase in the number

to prevent exposure to harmful substances. While this factsheet will concentrate on vegetable gardens, the information is applicable to

Practice Guide #27
Winter 2010

Establishing Urban Agriculture in Your Community: What You Need to Know Before You Get Your Hands Dirty

by

Allison Houlihan Turner
West Chester University

UNIVERSITY OF LOUISVILLE.
CENTER FOR ENVIRONMENTAL POLICY & MANAGEMENT

er for Environmental Policy and Management
nmental Finance Center: Serving EPA Region 4

Environmental Sciences Analytical Center
@ Brooklyn College

How to Read the Numbers

Heavy Metals in Garden Soil

How do your numbers compare to overall New York City levels and the New York State Department of Environmental Conservation's Soil Cleanup Objectives?

The NYS Dept. of Environmental Conservation's Soil Cleanup Objectives (SCOs) are the values aimed for in cleaning contaminated soils for residential purposes. The following table is a summary of data analyzed and compiled at our lab. Most of the samples were sent in from NYC's five boroughs but some samples were also received from upstate NY and other states. In general, suburban or rural area samples have much lower toxic metal levels but the table provides a comparative starting point. The values will be updated as the analyses database grows.

Typical Gardening BMPs

(from USEPA's "*Growing Gardens in Urban Soils*")

1. Locate gardens away from old painted buildings, roads with heavy traffic and soil with known or suspected contamination;
2. Build raised beds *or* remove existing soil and replace it with soil known to be clean;
3. Place landscape fabric between ground soil and new, clean soil;
4. Use a thick layer of organic material such as compost or mulch;
5. Wear gloves as a barrier between your hands and the soil;

Typical Gardening BMPs

(from USEPA's "*Growing Gardens in Urban Soils*")

6. Avoid bringing contaminated soil into the home by:
   - Cleaning tools, gloves and shoes before bringing them indoors.
   - Putting highly soiled clothes in a bag before bringing them indoors and washing them promptly in a separate load.
   - Washing off excess dirt from crops, especially root crops and leafy vegetables, before bringing them indoors.
7. Watch over small children to stop them from eating soil through hand-to-mouth play;
8. Wash hands immediately after gardening and before eating to avoid accidentally eating soil;

Typical Gardening BMPs

(from USEPA's "*Growing Gardens in Urban Soils*")

11. Throw away the outer leaves of greens, especially from the bottom of plants, before washing. Soil particles are most likely to be located on the outer leaves of leafy plants.
12. Wash produce using running water.
13. Peel vegetables, especially root vegetables, which are in direct contact with soil.

But What Is DEP's Enforcement Angle?

- As Proposed, the MCP would REQUIRE that the Permanent Solution Statement contain RECOMMENDATIONS for the use of Gardening BMPs under certain conditions.

- The relevant question is:

  "Does the PSS contain the appropriate BMP recommendations?

DEP's Goal is to educate & inform & minimize potential exposures where the direct contact risks are already demonstrated to pose NSR, and the incremental exposure – even without BMPs – is thought to be minimal but difficult to quantify.

3. Elevated OHM attributable to Anthropogenic Background

- Revised use of “background” in risk characterization process
  310 CMR 40.0902
- Revised Background definitions
  310 CMR 40.0006

Background Clarification
(Subpart I)

- *Currently* background defined to pose "No Significant Risk"

- New approach: OHM at or below Background are simply not included in MCP Risk Characterization

A subtle but important distinction

New Definition
310 CMR 40.0006

Background means those levels of oil and hazardous material that would exist in the absence of the disposal site of concern, including both **Natural Background** and **Anthropogenic Background**.

New Definition
310 CMR 40.0006

Natural Background means those levels of oil and hazardous material that would exist in the absence of the disposal site of concern, are ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern, and are attributable to geologic or ecological conditions.

New Definition
310 CMR 40.0006

Anthropogenic Background means those levels of oil and hazardous material that would exist in the absence of the disposal site of concern and which are:

(a) attributable to atmospheric deposition of industrial process or engine emissions and are ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern;

(b) attributable to Historic Fill;

(c) associated with sources specifically exempt from the definitions of disposal site or release as those terms are defined in MGL c. 21E and 310 CMR 40.0006;

(d) releases to groundwater from a public water supply system; or

(e) petroleum residues that are incidental to the normal operation of motor vehicles.

New Definition
310 CMR 40.0006

Historic Fill – *you know it when you see it.*

New Definition
310 CMR 40.0006

Historic Fill means Fill Material that based on the weight of evidence and consistent with the Conceptual Site Model:

(a) was emplaced before January 1, 1983;

(b) may contain, but is not primarily composed of, construction and demolition debris, reworked soils, dredge spoils, coal ash, wood ash or other solid waste material;

Historic Fill Definition, continued…

310 CMR 40.0006

(c) was contaminated with metals, hydrocarbons, and/or polycyclic aromatic hydrocarbons prior to emplacement, at concentrations consistent with the pervasive use and release of such materials prior to 1983;

(d) does not contain oil or hazardous materials originating from operations or activities at the location of emplacement;

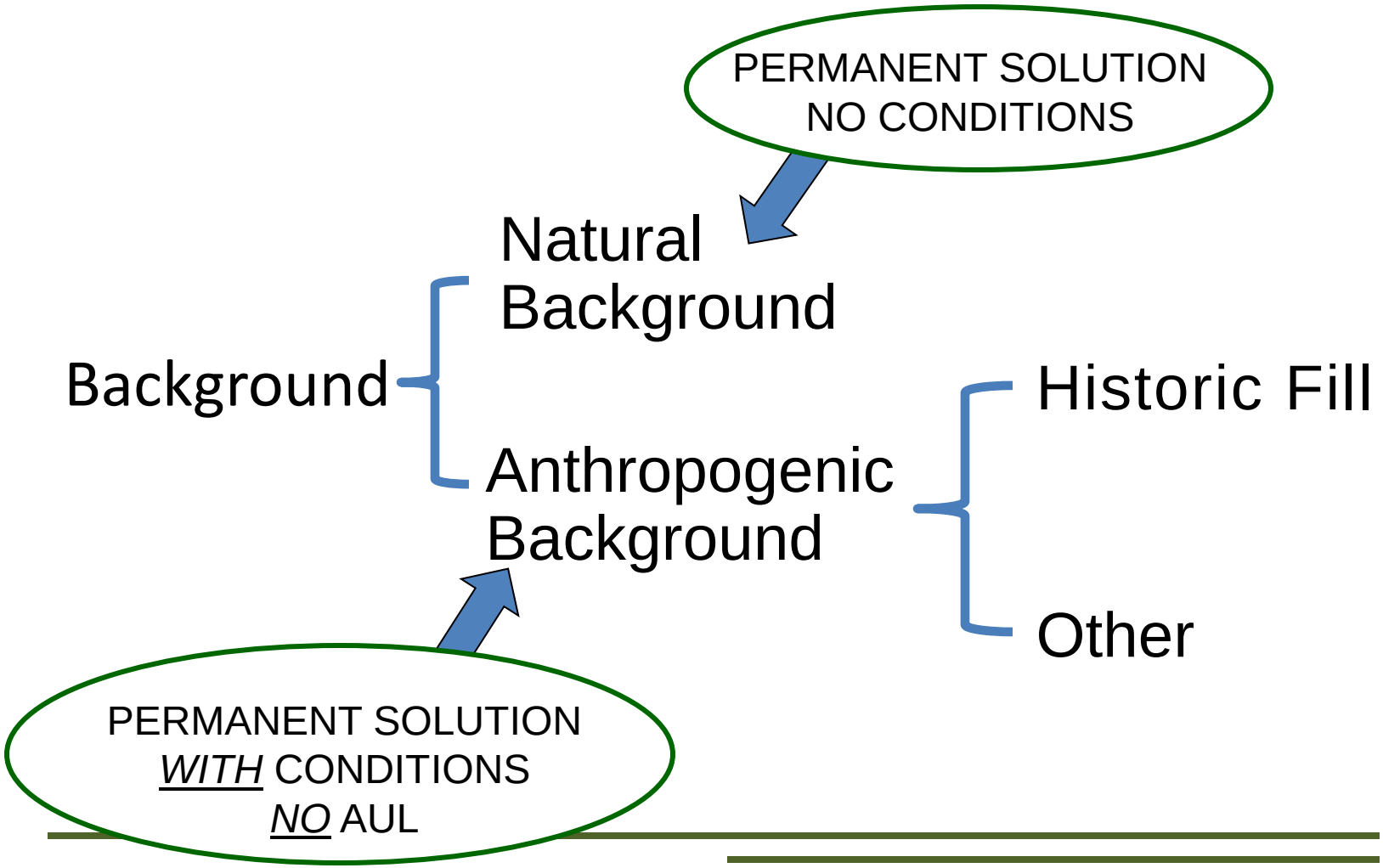
(e) is not and does not contain a generated hazardous waste, other than Oil or Waste Oil.

Historic Fill Definition, continued…
310 CMR 40.0006

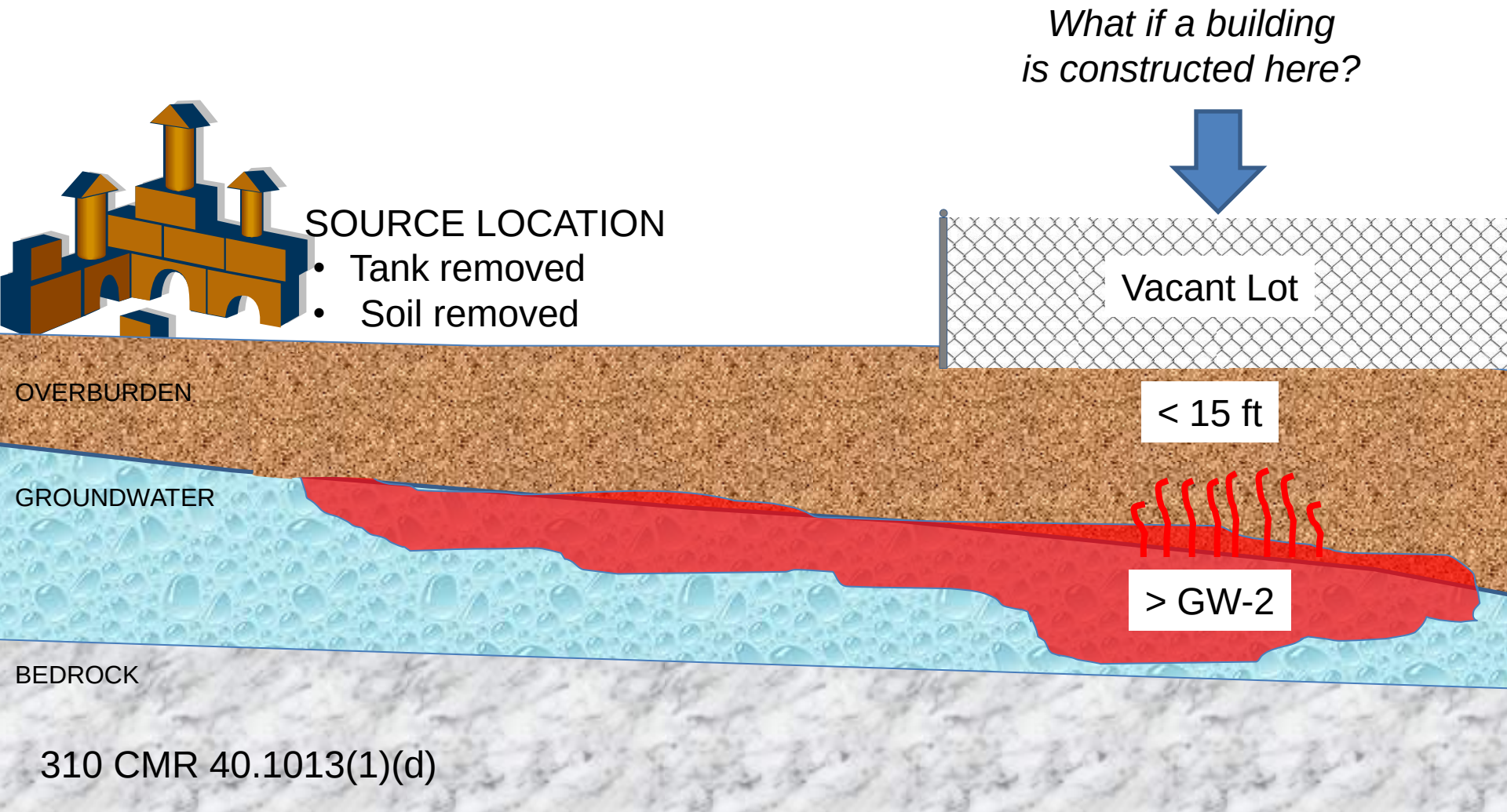
(f) does not contain chemical production waste, manufacturing waste, or waste from processing of metal or mineral ores, residues, slag or tailings; and

(g) does not contain waste material disposed in a municipal solid waste dump, burning dump, landfill, waste lagoon or other waste disposal location.

Background & Historic Fill



4. Absence of an occupied building, but OHM in groundwater greater than GW-2 levels



310 CMR 40.1013(1)(d)

Permanent Solution with Conditions & AUL

- For Active Exposure Pathway Elimination Measures (e.g., active sub-slab depressurization systems)

- AUL to provide notice of obligations

310 CMR 40.1012(2)(b) &
310 CMR 40.1041(2)(b)(1)

Updated MCP Standards

MCP Standards – Basis of Revisions

- Updated toxicity values
- Updated indoor air background
- Removed produce consumption exposures
- Removed “sludge” criteria for Pb, Zn and PCBs
- Changed S2 and S3 background levels to “concentrations associated with fill material”
- Simplified and updated the Relative Absorption Factors (RAFs)
- Corrected hardness-based NRWQC calculations

Updated MCP Standards

Of the 1,928 MCP Numerical Standards:

- 408 values (21%) went up (less stringent)
- 192 values (10%) went down (more stringent)
- 1,328 values (69%) stayed the same

Pb – Method 1 Standard Changes

- Current S-1, S-2 & S-3 Pb standards of 300 mg/kg based on land application of sludge regs

- New S-1 Pb standards of 200 mg/kg (**95th percentile of natural background**);

- New S-2 and S-3 Pb standard of 600 mg/kg **(90th percentile of anthropogenic background)**

Other Notable Updated Standards

- PCBs
  - S1: 2 mg/kg → 1 mg/kg;
  - S-2/3: 3 mg/kg → 4 mg/kg
- TCE GW-2: 30 ug/L → 5 ug/L
- Ni S1 (& RCS-1): 20 mg/kg → 600 mg/kg
- Cd S1 (& RCS-1): 2 mg/kg → 70 mg/kg

Transmittal Forms – eDEP Updates

Transmittal Forms Update

- Long Overdue
- Converted PDF forms to Web (HTML) Forms
- Many (most?) Bugs Fixed

  (new bugs created??? ☹)
- New forms rolled out over 6 months December 2013 – May 2014
- EIPASS will address longer-term enhancements

Next Forms Update

- Thursday
  April 20th-ish, 2014

- BWSC104 - POTS
  BWSC107 - Tier Classification
  BWSC113 - AUL