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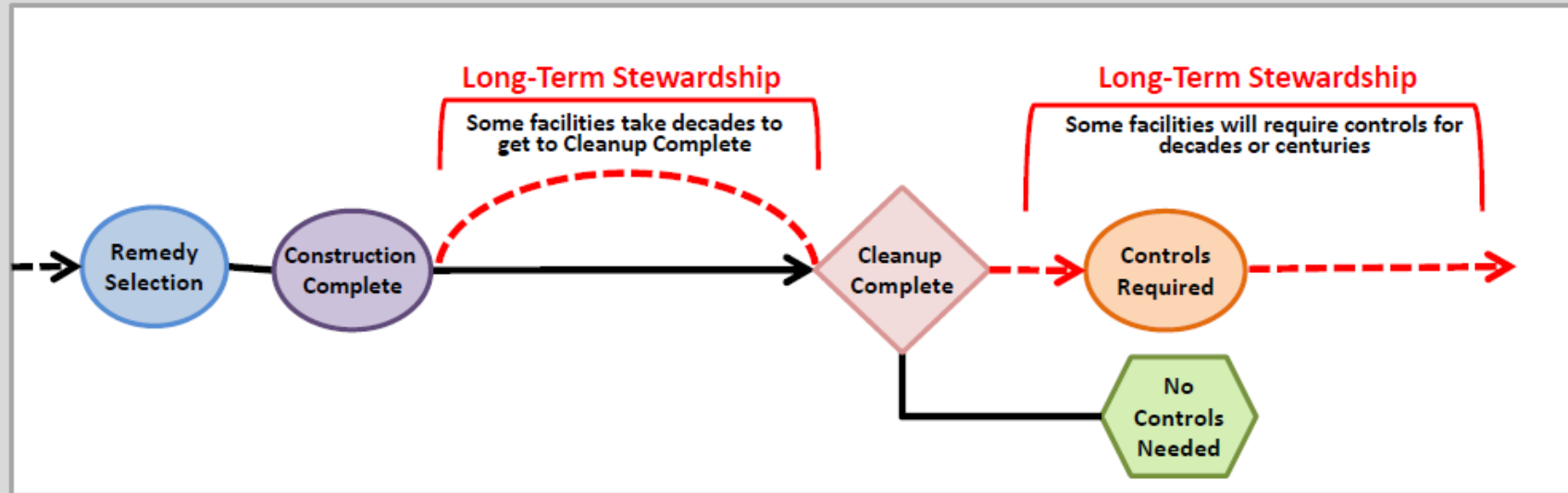
Long Term Stewardship Strategies : Before and Beyond Closure

Steven D. Folsom, P.E BCEE

July 8, 2015



Long-Term Stewardship



Remedy Selection
Final remedies chosen (CA400)

Construction Complete
All final remedies have been built. Sites vary in the amount of time to achieve final cleanup goals. Some achieve goals immediately, (e.g. dig and haul), some take decades of operation & maintenance (CA550)

Cleanup Complete (CA900s)

Cleanup Complete - No Controls Needed
Safe for all uses . (CA900 NC)

Cleanup Complete - Controls Required
These sites have remaining contamination , & often require Engineering Controls (ECs), Institutional Controls (ICs) , use restrictions, and long-term stewardship. (CA900 CR)

Long-Term Stewardship (LTS)
Sites that have remaining contamination and require treatment or controls for extended periods also require periodic monitoring and verification to ensure that controls are effective and that the site remains safe.

What They Are

- Legal, engineering, and administrative tools used to maintain protection of human health and the environment at sites.
- Used to:
 - Restrict site uses,
 - Modify behavior, and/or
 - Provide information to people



What They Are Not



Types of LTS (Institutional Controls)

- 1) Government Controls - include local laws or permits (e.g., county zoning, building permits, and Base Master Plans at military facilities);
- 2) Proprietary Controls - include property use restrictions based on private property law (e.g., easements and covenants);
- 3) Enforcement Tools - include documents that require individuals or companies to conduct or prohibit specific actions (e.g., environmental cleanup consent decrees, unilateral orders, or permits); and,
- 4) Informational Devices - include deed notices or public advisories that alert and educate people about a site.

Two “Flavors” of LTS

1. LTS starts before NFA determination.
 - Permit or enforcement action in place.
 - Responsible party “on the hook.”
2. LTS starts after NFA determination.
 - Permit or enforcement action generally not in place.
 - Responsible parties & responsibilities not adequate or well defined.



- **Regulatory Acceptance**
- **Appropriateness/Effectiveness of Land Use Restrictions**
- **Economics of Real Estate Productivity**
- **Liabilities posed by Residual Contamination and Liability Protections**
- **Funding Continuing Obligations**
 - **Responsible Party,**
 - **New Owner/Operator,**
 - **Regulatory Agency**

Planning

Implementation

Monitoring

Enforcement

Regulatory Components of LTS

Enforce

A light blue downward-pointing arrow with a white outline, indicating the flow from the 'Enforce' step to the 'Verify' step.

Verify

A light blue downward-pointing arrow with a white outline, indicating the flow from the 'Verify' step to the 'Modify/Terminate' step.

Modify/Terminate

A light blue downward-pointing arrow with a white outline, indicating the flow from the 'Modify/Terminate' step to the 'Report' step.

Report

- **Defining Pathway(s) to Closure (Goal)**
- **Tailored Remedial Action Objectives**
- **ARARs (Complimentary-Competing Regulations)**
- **Contingencies**
- **Risk Analysis (Regulatory, Technical, Business)**
- **Life-Cycle Costs**
- **Cost-Benefit Analysis**



Limited Liability Protections

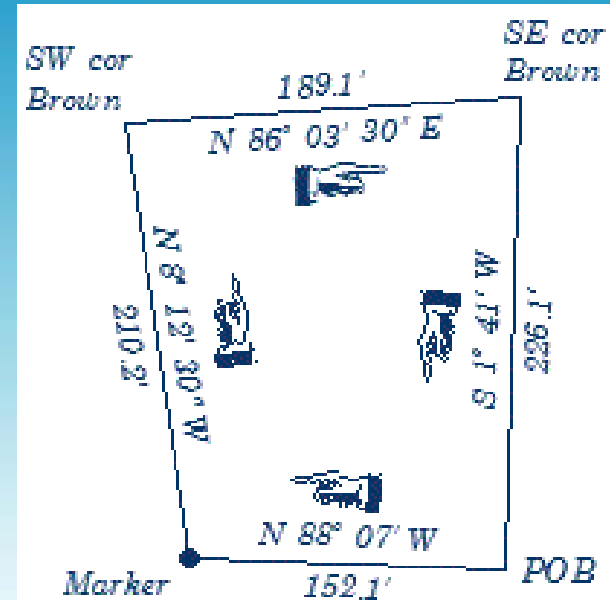
**Continuing Obligations LLPs remain available.....
.....so long as the landowner:**

- **Takes reasonable steps to stop/prevent any ongoing release;**
- **Provides full cooperation in connection with response actions;**
- **Compliant with any land use restrictions or request for information;**
- **Does not impede the integrity of any institutional control employed for response actions; and**
- **Provides legally required notices with respect to the discovery of Hazardous Substances**

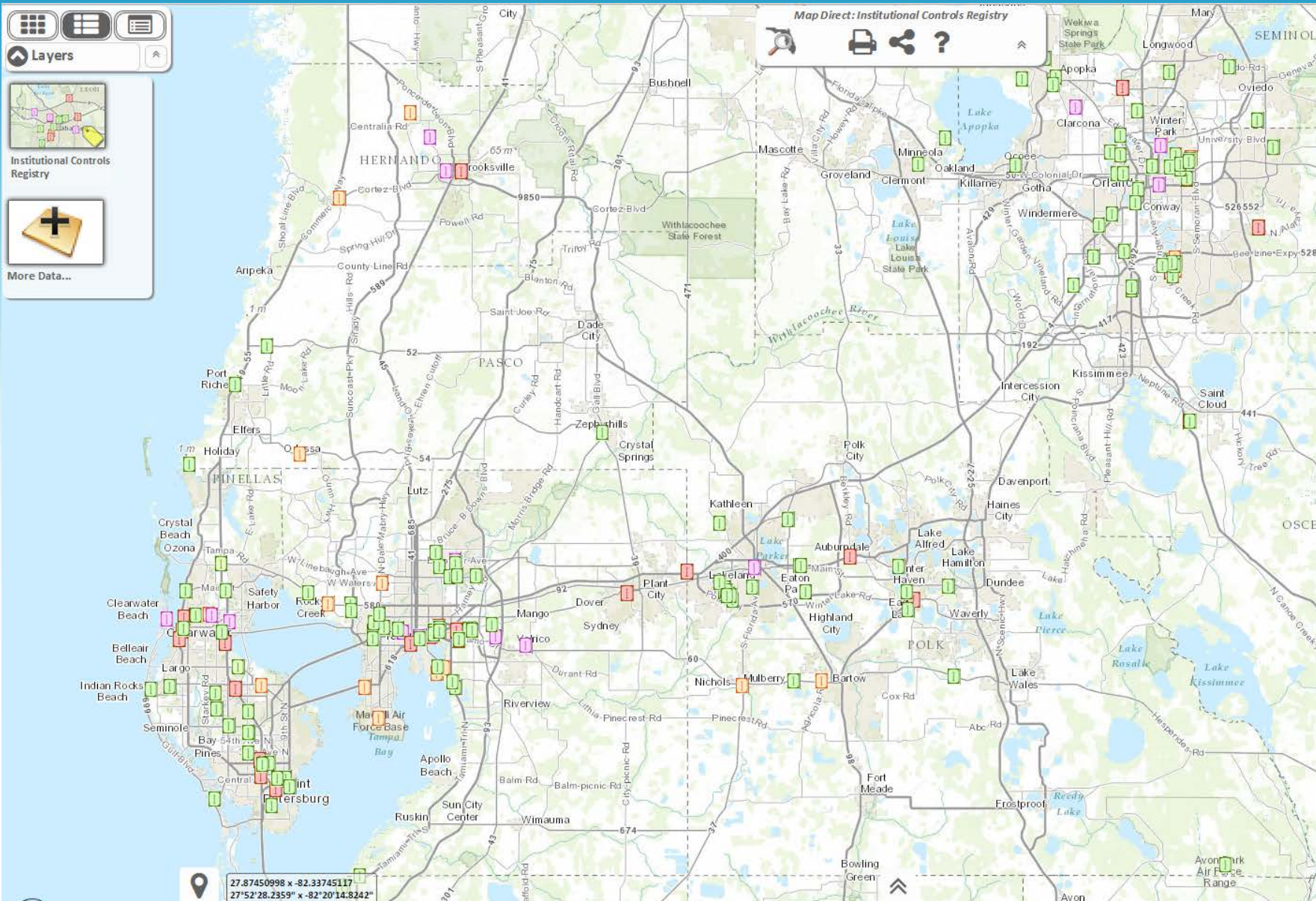
- **Benefits of a written continuing obligations plan include documenting:**
 - Evidence of LLP compliance to assist a User seeking liability defenses;
 - A record of the “baseline” environmental site information upon which continuing obligations were based; and
 - Framework for future activities intended to ensure ongoing continuing obligations compliance.
 - Roles and Responsibilities

Metes & Bounds?

- **POB Using Legal Description:**
 “Beginning on the south line of the 3.39 acre strip of land described in the deed to the City of Palmetto, recorded August 11, 1948, Book 1272, Official records, page 161, at the northwest corner of the 8.938 acre parcel...”
- **POB Using Geographic Description:**
 “26.92500 N, 82.36308 W”



Graphical Information Systems



Geospatial Documentation



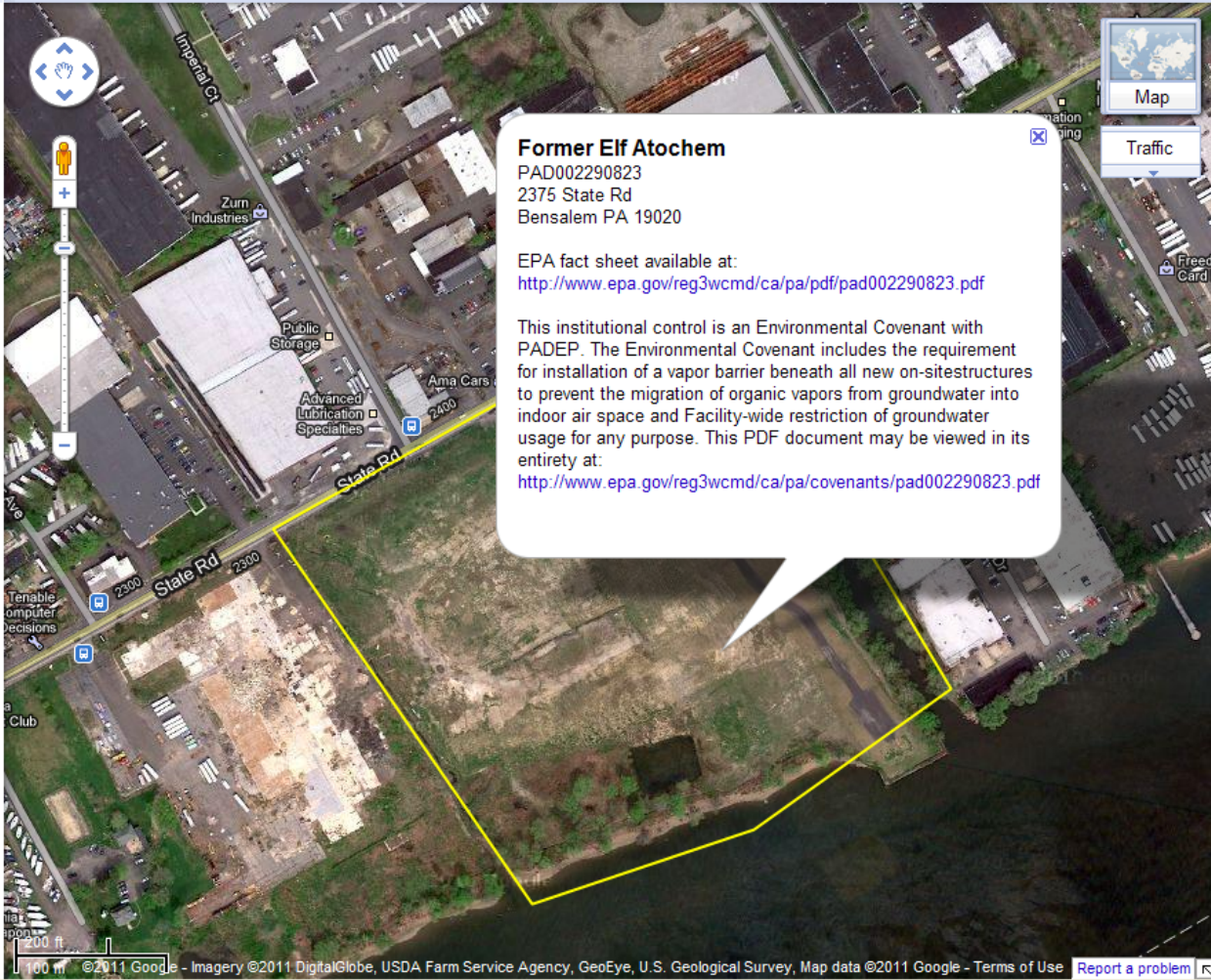
Google maps

http://www.epa.gov/reg3wcmd/ca/pa/kml/map_PAD002290823.kml Search Maps

Get Directions My Maps Save to My Maps

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 Property_Boundary
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PAD002290823 2375 State Rd Bensalem PA 19020 EPA fact sheet available at: <http://www.epa.gov/reg3wcmd/ca/pa/pdf/pad002290823.pdf>
 Elf Atochem North America Inc.
PAD002290823 2375 State Rd Bensalem PA 19020
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Preventive Approach: One-Call System



 **Dig Clean**
 A National Environmental Safety Advisory to Excavators
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Dig Clean provides excavators with Environmental Safety Advisories related to underground cleanup facilities or residual contaminants near planned excavations. Choose your state, enter the Ticket Number generated by the One Call Clearance Center, and press submit. Dig Clean will display Environmental Site Advisories, if any, associated with the Ticket Number you enter.

This is a pilot service being applied in several states. Dig Clean Safety Advisories will only appear only if Dig Clean customers have identified Environmental Safety Boundaries near your planned excavation. The FAQ discusses limitations with the service at this time. Thank you for your participation.



Dig Clean Advisory Search

Option 1: State and Ticket Number

Select State:

Enter Ticket:

Option 2: Reference Number

Enter Reference Number:

TO: JONAS COCHRAN, JOSEPH A COCHRAN
 Phone: (302) 652-6628
 Email: (302) 652-6660
 zebraconst@aol.com

FROM: Delaware Department of Natural Resources & Environmental Control
 Primary Contact: Wendy March
 Phone: 302 395 2600 ext.302 395 2601
 Email: Wendy.March@state.de.us

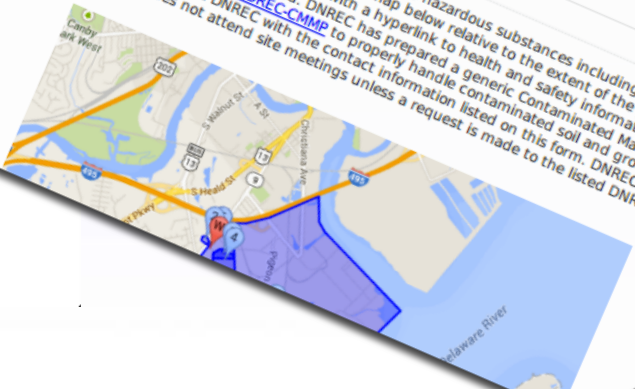
Subject: Dig Clean Safety and Land Use Advisory Ticket: 140840176

Ticket Priority: STANDARD
 Work Address: 4030 NEW CASTLE AVE, NEW CASTLE
 Near Intersection: ALDRICH LANE
 Work Description: Extent Of Work: LOC THE ENTIRE FRONT OF THE PROP. LINE REPAIR-NE

Work Date: 2014-03-28 00:00:00
 Work Done For: RICK RYAN
 Location Details: .
 Comments: Work Type: WATER SERVICE

Dig Clean Safety and Land Use Advisory

Please be advised that the work location may be at or near sites where hazardous substances including petroleum are likely present in the soil or groundwater. Sites are shown on the map below relative to the extent of the planned excavation. Known contaminants of concern are also listed with a hyperlink to health and safety information (if available), and whether soil or groundwater is impacted. DNREC has prepared a generic Contaminated Material Management Plan <http://shortlinks.terradox.com/DREC-CMMP> to properly handle contaminated soil and groundwater. If further guidance is needed please contact DNREC with the contact information listed on this form. DNREC does not provide excavation field marks, and does not attend site meetings unless a request is made to the listed DNREC Primary Contact.



- **IC/EC are an instrumental RBCA tool**
- **Not a fix-all**
- **Comes with strings attached**
- **Thoughtful LTS Strategies streamline effectiveness**
 - **RP Compliance**
 - **Limited Liability Protections**
- **Human Health and Environment Protections**



Thank You

**Steven D. Folsom, P.E. BCEE
HSW Engineering, Inc.
Tampa, Florida
sfolsom@hsweng.com**