Adequacy of the Investigation/Remediation of the Brisbane Baylands UPC Property Contamination Relative to Development

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Topics

- Background to Review
- Summary of Findings: Area Contamination, Remediation, Monitoring
- Key Issues: Protecting Public Health & Environmental Quality with Developing Brisbane Baylands Area

Our Backgrounds

G. Fred Lee, PhD, AAEE Bd Cert Env. Engr., F.ASCE

- BA San Jose State University – 1955
  - Public Health
  - Environmental Science
- MSPH University North Carolina – 1957
  - Public Health
  - Environmental Quality
- PhD Harvard University – 1960
  - Environmental Engineering
  - Public Health
  - Aquatic Chemistry

Our Backgrounds

G. Fred Lee, PhD, AAEE Bd Cert Env. Engr., F.ASCE

- 30 yrs University Graduate-Level Teaching & Research
  - Focus: Water Quality Investigation & Management
  - $5-million in Research
  - 500 Professional Papers & Reports
- Since 1989: Full-Time Consultant
  - G. Fred Lee & Associates, El Macero, CA
  - 600 More Papers & Reports on Chemical Impacts & Control
  - Overall Focus:
    - Impacts of Chemicals on Public Health & Environment
    - Investigation & Remediation of Hazardous Chemical Sites Including ~ 80 Landfills & Superfund Sites
    - Water Quality Criteria for Protection of Public Health & Environment

Our Backgrounds

G. Fred Lee, PhD, AAEE Bd Cert Env. Engr., F.ASCE

- Provide Service to:
  - Governmental Agencies
  - Public & Environmental Groups
  - Industry & Commercial Interests
- Nature of Consulting Work:
  - Providing Comprehensive Evaluation of Existing & Potential Public Health & Environmental Impacts of Regulated & Unregulated Chemicals
  - Contributing to Development of Improved Regulations for Hazardous Chemicals
  - Service to Profession & Public
- Author & Publisher *"Stormwater Runoff Water Quality Newsletter"*

Our Backgrounds

Anne Jones-Lee, PhD

- BS Southern Methodist University – 1973
  - Biology
- PhD University Texas, Dallas – 1978
  - Environmental Science
- 11 yrs University Graduate-Level Teaching & Research
  - Focus:
    - Impacts of Chemicals & Pathogens on Public Health
    - Water Quality Evaluation
- Worked with Dr. Lee since 1975
  - Research & Consulting
  - Co-Authored Numerous Papers & Reports
  - Editor of *"Stormwater Runoff Water Quality Newsletter"*

BBCAG Statement of Mission

- The Purpose of the Brisbane Baylands Community Advisory Group (BCCAG) Is to Provide an Open Forum and Community Based Input from the Communities of Brisbane, Daly City and San Francisco and to Advise the Agencies Charged with the Remediation Actions on Three Contiguous Sites Commonly Referred to as the Brisbane Baylands.

Purpose of Review

- Independent Assessment of
  - Adequacy of Past Studies of Pollutants in Soil & Water, & Gaseous Releases to
    - Properly Define Presence & Public Health/Environmental Quality Implications of Potentially Hazardous Chemicals in UPC Brisbane Baylands Area That May Impact Development of Area & Guadalupe (Brisbane) Lagoon

Issue

- Universal Paragon Corporation (UPC) Purchased Brisbane Baylands Area for Commercial/Public Space & Residential Development

- Property Development While Fully Protecting Public Health and the Environment

Identified Contaminated Areas
– Areas of Concern –

- Brisbane Landfill
- OU-1 (Former Schlage Lock Facility & Southern Pacific Area)
- OU-2 (Former Bayshore Railyard) Areas
- Kinder Morgan (Brisbane Fuel Terminal/Distribution)
  - External Source of Pollutants

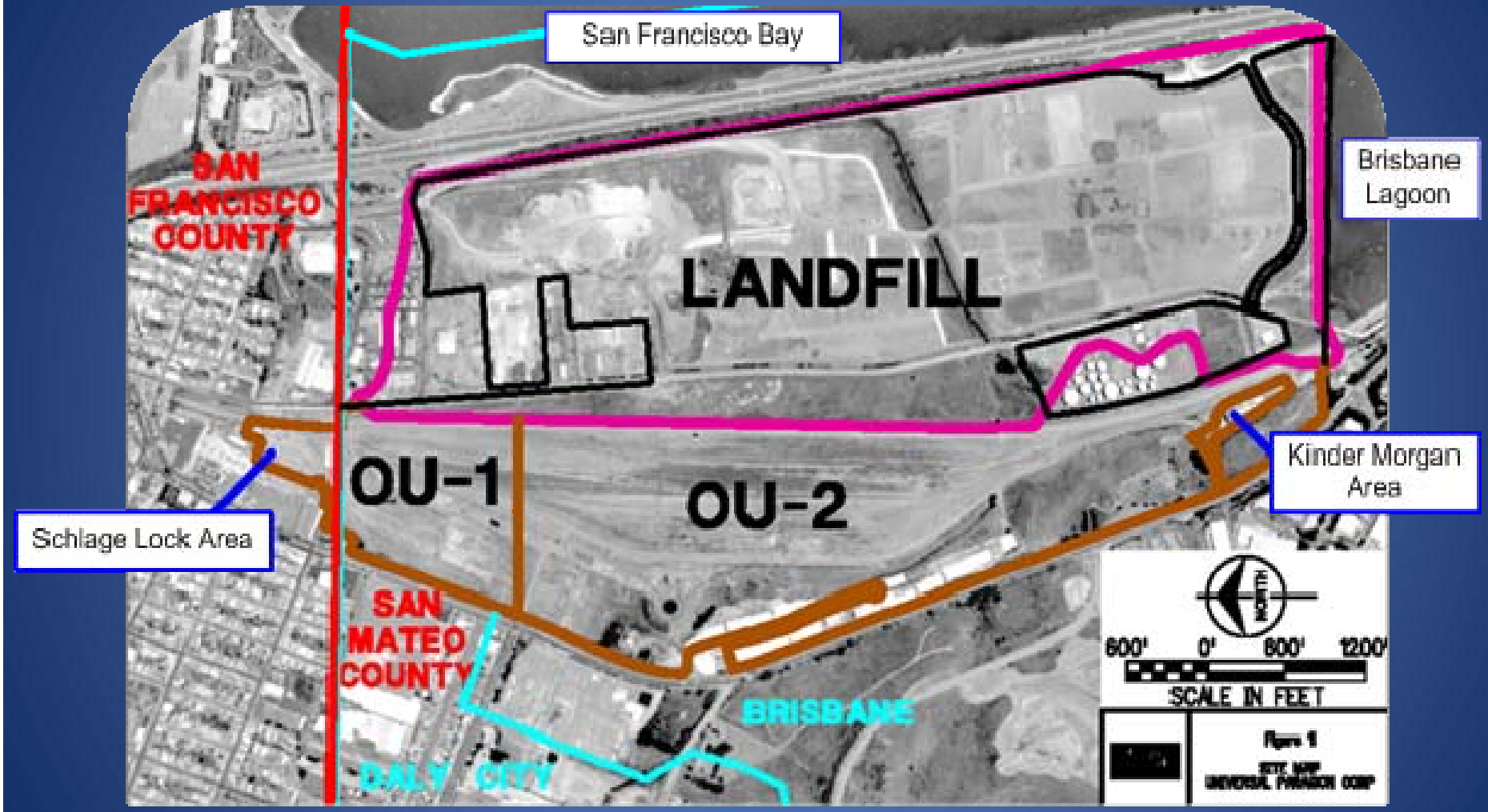
Aerial Photograph of Brisbane Baylands Area

(After Pal, 2009)

Annotated Aerial Photograph of Brisbane Baylands Area

(After Pal, 2009)

Aerial Diagram Brisbane Baylands Area



After:
Pal, V., "Baylands OU-2 Status Presentation," Presentation of Project Manager, State Water Resources Control Board San Francisco Bay Region, to BBCAG, June 16 (2009).

Approach

- Collected & Reviewed Background Information on Areas of Concern
  - Reports Provided by BBCAG
- Searched Internet for Additional Information
- Contacted Regulatory Agencies – DTSC, SFRWQCB
- Visited Site July 23, 2010
- Worked Closely with Cris Hart & Clara A. Johnson of BBCAG

Overview Summary – Specific Findings

- Landfill Gas Emissions
  - Brisbane Landfill Largely Stabilized Vis-à-vis Landfill Gas Emission Rate
  - Methane & Other Hazardous Chemical Gases (e.g., VOC) Still Being Slowly Released through Landfill Gas Collection System & Cover
  - Releases Will Continue in Future
    - Must Prevent Entrance of Landfill Gas & Other Volatile Chemicals into Buildings
    - Must Evaluate Efficacy for Development Structures of Mitigation Measures (e.g., Protective Barriers, Venting)
    - Must Monitor Lower Levels of Buildings Placed Atop Landfill for Methane & VOC's

Overview Summary – Specific Findings

- "Hazardous Wastes" vs Hazardous Chemicals in Brisbane Landfill
  - "Hazardous Waste" ≠ "Hazardous Chemicals"
  - "Hazardous Waste" Is Specific Regulatory Classification
    - Addresses a Few of Thousands of Hazardous Chemicals That Could Be Expected in Municipal Solid Waste
    - Exemptions from Classification Allow Disposal
    - Finding No "Hazardous Waste" Deposition ≠ No Hazardous or Otherwise Deleterious Chemicals Present
    - Chemical "Below Detection" ≠ Chemical Not Present or Chemical Not Threat to Public Health/Environment

Overview Summary – Specific Findings

- "Hazardous Wastes" vs Hazardous Chemicals in Brisbane Landfill
  - Irrespective of Classification of Deposited Wastes, Hazardous Chemicals Typically Associated with Hazardous Wastes Are
    - Present in Brisbane Landfill
    - Being Released from Brisbane Landfill
  - Primary Issues of Concern:
    - Brisbane Landfill Currently Releasing Hazardous Chemicals That Are Threat to Public Health & Environment
    - Great Care Needed in Developing Property to Ensure Releases Adequately Monitored/Controlled to Protect Public Health & Environment for as Long as Wastes Remain on Property

Overview Summary – Specific Findings

- Groundwater Pollution by Brisbane Landfill
  - Brisbane Landfill Polluting Groundwaters with Hazardous Chemicals That Are Threat to Public Health & Environment
    - Groundwater under Landfill
    - Seeps Along Perimeter
    - Interior Drainage Channel
  - SF Regional WQCB Required Interception of All Known Leachate Seeps to Lagoon
    - Could Be Presently Unknown Subsurface Discharges of Leachate-Polluted Groundwater to Lagoon That Have Potential to Adversely Affect Aquatic Life
    - Lagoon Not Adequately Monitored for Potential Impacts
      - Especially Bioaccumulation of Chemicals in Edible Organisms – Impacts on Human Health, Aquatic Life, & Waterfowl

Overview Summary – Specific Findings

- Stormwater Runoff Water Quality Monitoring
  - Water Quality Monitoring of Stormwater Runoff at Brisbane Landfill (and Elsewhere) Significantly Deficient Compared with
    - US EPA Guidelines
    - What Is Needed for Protection of Public Health/Environment
  - Water Quality Monitoring of Stormwater Runoff during Development Needs Significant Expansion
  - Need Reliable Determination of Extent to Which Development Activities Mobilize Hazardous Chemicals into Runoff Waters

Overview Summary – Specific Findings

- OU-1 (Former Schlage Lock & SP Sites)
  - Groundwater & Soil Polluted
    - VOCs (Volatile Organic Compounds)
      - TCE (trichloroethylene)
      - PCE (perchloroethylene)
      - VOC-Contaminated Groundwater Beneath SP Area
        - Origin: Groundwater Beneath Schlage Lock Area
    - Metals
      - Arsenic
      - Chromium
      - Lead
      - Nickel
      - Metals-Contaminated Soil in SP Area
    - Petroleum Byproducts
      - Contaminated Soil in SP Area

Overview Summary – Specific Findings

- OU-1 (Former Schlage Lock & SP Sites)
  - DTSC (CA Department of Toxic Substances Control)
    - Regulator in Charge of Oversight
    - Conducting Pilot Studies for “Removal” of VOCs from Soil
      - Injection of Chemicals to React with VOCs
      - Capabilities & Efficacy of Approach Not Demonstrated
    - Not Developed Approach for Heavy Metal Remediation
      - Approach & Potential Success Depend on Types of Land Use Allowed in Area
        - Implications of Proposed Remediation for Protection of Public Health & Environmental Quality from Heavy Metals at Site Need to Be Evaluated & Addressed Through Regulatory Agency and Public Review

Overview Summary – Specific Findings

- OU-2 (Former Bayshore Railyard)
  - Groundwater & Soil Polluted
    - Petroleum Hydrocarbons
      - Diesel Fuel
      - Bunker C Oil
    - Heavy Metal – Lead
    - Semi-Volatile Organic Compounds (SVOCs)
    - Chlorinated Solvents

Overview Summary – Specific Findings

- OU-2 (Former Bayshore Railyard)
  - Need Consideration of
    - Other Potentially Hazardous & Otherwise Deleterious Chemicals That May Be Associated with Complex Mixtures of Chemicals at Site
      - Known
      - Unrecognized
      - Yet-to-Be-Identified
    - Other Chemicals May Exhibit Migration Characteristics Significantly Different from Bunker C Oil

Overview Summary – Specific Findings

- OU-2 (Former Bayshore Railyard)
  - Proposed Remediation:
    - UPC Consultants: Bunker C Oil & Heavy Metals Not Mobile – Propose to Cap with Soil Layer
    - Halogenated VOCs Mobile – HVOC-Contaminated Soils to Be Excavated & Removed
  - Issues:
    - Inadequate Attention to Myriad Hazardous Chemicals Expected at Such a Site or That Have Migration Characteristics Different from Bunker C Oil
    - Proper Containment Can Reduce Hazardous of Chemicals Left On-Site If
      - Groundwater & Surface Water Runoff Adequately Monitored for as Long as Hazardous Chemicals Remain on Site to Ensure That Known or Yet-to-Be-Identified Pollutants
      - Adequate Deed Restrictions Enforced *ad infinitum*

Overview Summary – Specific Findings

- Kinder Morgan Site
  - Fuel Terminal/Distribution Area; Petroleum Storage & Distribution Terminal
  - Located in Part on Closed Brisbane Landfill
  - Area Groundwater Contaminated with
    - Gasoline
    - Diesel & Aviation Fuels & Fuel additives (benzene, toluene, ethylbenzene, xylene (BTEX), and methyl-tertiary butyl ether (MTBE)
  - Evidence That Groundwaters under Brisbane Landfill Being Polluted by Chemicals from Kinder Morgan Site
  - Threat to Cause Further Pollution of Groundwater & Surface Waters of Concern to BBCAG in Brisbane Baylands Area

Overview Summary – Specific Findings

- Kinder Morgan Site
  - Issues
    - SFRWQCB Current Remediation Order
      - Major Step in Appropriate Direction to Begin to Control Pollution On & Off Site
    - Need Ongoing, Independent Review of Progress toward Stopping Further Off-Site Pollution by Pollutants Transported in Surface & Groundwater
      - Assessing Adequacy of Currently Adopted Off-Site-Transport Trigger Levels for Eventually Stopping All Off-Site Transport of Pollutants
        - Identified Pollutants
        - Yet-to-Be-Identified Pollutants

Key Findings
Site Contamination & Development Proposal

- Contaminated Areas Contain Complex Mixtures of Variety Known Hazardous Chemicals
  - Threat to
    - Public Health of People Who Use These Areas
    - Environment Including Guadalupe (Brisbane) Lagoon & San Francisco Bay
- Site Pollution by Some Hazardous Chemicals
  - Groundwaters
  - Threat to Pollute Surface Water Runoff
  - Hazardous & Otherwise Deleterious Chemicals Pose Threat to Public Health & Environmental Quality in On-Site & Off-Site Areas

Key Findings
Site Contamination & Development Proposal

- Areas of Concern Also Contain Hazardous & Otherwise Deleterious Chemicals That Are
  - Unmonitored,
  - Unregulated, &/or
  - Unidentified
  - But Pose Threats to Public Health & Environmental Quality of On-Site & Off-Site Areas
- Cannot Presume That Meeting Current Regulations for Remediation Ensures Long-Term Protection of Public Health or Environmental Quality

Key Findings
Site Contamination & Development Proposal

- Development Likely to Proceed with Only Limited Removal of Hazardous Chemicals from Many Areas of Concern
  - Some Removal/Treatment Proposed for Some Contaminated Areas
- UPC's Proposed Plans Appear Focused on Creating
  - Commercial Areas
  - Open Space Areas
  - Residential Housing
- Planning to Leave Substantial Amounts of Regulated & Unregulated Hazardous & Otherwise Deleterious Chemicals & Yet-to-Be-Recognized Hazardous Chemicals in Area
  - Soil-Layer Barrier between Contaminated Soils & Developed Surface & Near-Surface Soil Areas

Key Findings
Conclusions

- Protection of Public Health & Environmental Quality May Be Achievable with UPC Brisbane Baylands Development of Commercial & Open-Space Areas, But Not without Ensuring:
  - Reliable, Effective Barriers between Known, Recognized, & Yet-to-Be-Identified Hazardous Chemicals/Hazardous Transformation Products at Site & Developed Areas Where People or Environmental Elements Could Be Exposed
    - Active Monitoring & Maintenance Must Be Continued for as Long as Chemicals That Represent Threat to Public Health & Environment Remain On-Site

Key Findings
Conclusions

- Appropriate, Iterative, Comprehensive Monitoring of Movement of Hazardous Chemicals & Hazardous Transformation Products from Primary Areas of Occurrence
  - Identify & Treat/Control Hazardous Chemicals Transported via ♦ Groundwater ♦ Surface Water ♦ Gaseous Releases
  - To Protect Public Health & Environment, This Monitoring Must Be Continued for as Long as the Chemicals Are Present in ♦ Areas of Concern or ♦ Surface or Groundwater
    - For Some Chemicals ► Effectively Forever

Key Findings
Conclusions

- Ensure Inclusion of Chemicals Whose Impacts Become Identified in Future
  - For as Long as Waste Residues &/or Hazardous Transformation Products Remain On-Site
  - Requires Vigilance to Emerging Technical Information & to Updating Monitoring Program

Key Findings
Conclusions

- Restrictions on Activities In Areas Where Hazardous Chemical Residues Remain
  - Activities That Could
    - Expose Buried Contaminants
    - Compromise Integrity of Barriers
  - Examples of Restricted Activities:
    - Digging for Utilities or Other Purposes
    - Development of Deep-Rooted Vegetation

Key Findings
Conclusions

- Adequate & Reliable Deed/Land-Use Restrictions for Each Potentially Affected Area on Site
  - Reliable Enforcement for as Long as Chemicals/ Transformation Products That Are Threat to Public Health & Environment Remain On-Site
- Adequate Funding Should Be Provided by UPC & Purchaser(s) of Developed Property to Support
  - Independent Third-Party Monitoring
  - Assistance to Property Purchasers/Developers & Public, Including BBCAG
  - To Evaluate Adequacy of Ongoing Investigation, Remediation, Development, & Use Activities of Area

Key Findings
Conclusions

If Residential Development Is To Be Included

- Must Be Detailed Evaluation of
  - Nature, Types, & Locations of Proposed Residences & Support Facilities With Which Residents May Come in Contact, Relative to Contaminated Areas & Remediation & Monitoring Activities
- Residential Development Should Be Restricted to Uncontaminated Areas, i.e., to Areas Where No Hazardous Chemical Components/Transformation Products Remain

Key Findings
Conclusions

If Residential Development Is To Be Included

- Any Areas of Site Where Hazardous Chemical Residues/ Hazardous Transformation Products Are Left
  - Must Be Secured from Public Access &/or Unintended Trespass
- Areas Providing Public Service or Support for Residential Use (e.g., School, Daycare, Park Facilities)
  - Must Be Developed & Maintained to Preclude Direct or Inadvertent Exposure of People to Hazardous Chemicals Presently Known or Become Known at Any Time in Future

Report on the Adequacy of the Investigation/Remediation of the Brisbane Baylands UPC Property Contamination Relative to Development of this Property

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Prepared for the Brisbane Baylands Community Action Group (BBCAG)

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http://www.gfredlee.com/Landfills/BrisbaneBaylands.pdf
http://www.gfredlee.com/Landfills/BrisbaneBaylandsSlides.pdf

Acknowledgement
Information & Assistance Provided By

- Primary Contacts & Provided Reports for Review & Background Information; Arranged Site Visit
  - Cris Hart, Chair BBCAG
  - Clara A. Johnson, Remediation Subcommittee Chair BBCAG
- Dana Dillworth (BBCAG) Initial Contact Leading to Our Involvement in Project
- Virginia Lasky (DTSC Project Manager OU-1 Site)
- V. Pal (SF Bay Regional Water Quality Control Board Staff Overseeing OU-2 Site)
- A. Karpowicz (Regional Water Board Case Manger Overseeing Investigation of Kinder Morgan Area)
- Kenneth Johnson (Associate Planner City of Brisbane Planning & Community Development Department) Provided Background Information on Planning for Brisbane's Open-Space Requirements
- Howard R. Pearce (Engineering Project Manager for UPC) Provided Several Reports That We Reviewed; Answered Questions about Area during Site Tour
- Jason Lin (UPC Director Of Engineering)
- Krzysztof S. Jesionek (Geosyntec Consultants)
- Tom Graf (Jordan & Graf)

Participated in Site Tour & Answered Questions during Site Tour

Further Information

Consult Website of
Drs. G. Fred Lee and Anne Jones-Lee

http://www.gfredlee.com

General Findings

- Inadequate Monitoring and Regulatory Programs
  - Brisbane Baylands Areas Contain Complex Mixtures of Waste Materials/Chemicals – Not All Known, Recognized, Regulated
  - Currently Allowed Monitoring & Regulatory Programs for Investigation/Remediation of Hazardous Chemical Sites Consider Only Small Number of Potentially Hazardous Chemicals That Can Be Present In Such Waste Disposal Areas
  - Should Not Assume That Hazardous Chemicals in an Area No Longer Represent Threat to Public Health or Environmental Quality Just Because
    - Monitoring of Surface Water Runoff, Groundwater, or Airborne Gaseous Emissions Does Not Reveal Exceedances of Current Regulatory Limits, or
    - Chemicals Reported as “Non-Detect”
  - Ongoing Monitoring Programs Need to Consider Newly Recognized or Identified Pollutants

General Findings

- Need for Independent Third-Party Public Review
  - Deficiencies in
    - Regulations
    - Regulatory Agency Support
    - Advocacy of Interested Parties
  - Public Needs Its Own Overseer & Advocate for Protection of Public Health & Environmental Quality in Matters of Investigation And Remediation
  - Party(ies) Responsible for Pollution/Remediation/Development Should Be Required to Fund Public's Hiring of Qualified, Independent, Third-Party Experts
    - To Conduct Independent Monitoring
    - To Provide Oversight Review of Pre- & Post Development of Hazardous Chemical Site
    - To Assist Public & Future Property Owners/Users in Understanding Adequacy of Site Investigation & Ongoing Monitoring