Design and Construction Considerations on Brownfield Sites

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Development Components to be Integrated During the Development of Contaminated Properties

- Due Diligence
- Regulatory Involvement
- Site Assessment
- Site Remediation
- Civil Design and Permitting
- Insurance
- Contracts
- Construction
- Closure and Occupancy
Brownfield Development Philosophy

• At their most basic levels, developments on contaminated properties are no different than other site development projects. These projects are ultimately judged based on financial viability and benefit to the community.

• The environmental challenges and risks that are associated with these sites are addressed through the integration of well established engineering and scientific disciplines.
Development Philosophy

- It is the integration of the various disciplines that determines the success or failure of the project.
Design and Permitting

- Design and permitting components impacted by environmental challenges:
  - Site Layout – use of engineering controls
  - Stormwater
  - Utilities
  - Exposure to Occupants (Vapor Intrusion)
  - Grading
  - Geotechnical
  - Paving and Foundations
  - Irrigation
Construction

• Construction Components Impacted By Environmental Challenges
  o Grubbing
  o Dewatering
  o Grading and Earth Work
  o Health and Safety
  o Utility Construction
  o Vapor Intrusion
Engineering and Institutional Controls

- Engineering Controls – Used to control exposure to soil or groundwater
  - Soil Cover
  - Impervious cover (asphalt parking lot or building foundation)
- Institutional Controls – used to insure engineering controls or land use remain in place
Brownfield Site Design and Construction Success Stories
Brownfield Sites

• Malibu Bay - West Palm Beach
• Retail Store Philips Highway – Jacksonville
• HASSCO Rehabilitation Site - Jacksonville
Malibu Bay – West Palm Beach Florida
Background

• Portion of former golf course impacted with arsenic
• Soil and groundwater contamination above FDEP cleanup target levels
• Areas of greatest impact located in area of former greens and tees and maintenance facility
• Developer wanted to put multifamily affordable housing on the site and use Low interest Revolving Loan Fund to help pay for remediation
Brownfield Solutions

- No grubbing
- Moved potable water lines out of water table
- Constructed utility corridors with clean soil
- Prepared and implemented dewatering treatment and disposal plan
- Established Health and Safety Plan for site workers and air monitoring
- Used ECs and ICs to address contaminated groundwater
- Lined stormwater ponds
- Prepare and implement Engineering Control Maintenance Plan (ECMP)
Results

• First residential development using engineering and intuitional controls approved by FDEP in State of Florida
• First affordable housing project funded in USEPA Region IV
• Obtained VCTC
Retail Store - Jacksonville
Background

- 80,000 yards of solid waste and contaminated soil left on site by illegal dumping activities
- Contaminants include petroleum products, arsenic, and ammonia
- Significant groundwater contamination beneath waste areas
- Proposed development of 200,000 square foot Store and Gas Station on top of contaminated areas
Brownfield Solutions

- Placed stormwater controls on clean area of site and modeled effects of pond on contaminant transport.
- Moved utilities out of water table and in areas of clean soil
- Health and Safety Plan for site workers
- Dewatering plan, treatment, and testing
- Used parking lot and building foundation as ECs
- Screened solid waste to recue fines on site under EC and reduce costs
- Prepare and implement ECMP
Results

- Significantly reduced overall site cleanup costs by lowering off-site disposal costs
- Reduced groundwater impacts to below applicable standards
- Obtained VCTC and job bonus credits
- Provided retail and jobs in a blighted area of town
- Won FPZA award for large scale redevelopment
- Used by FDEP for model for remediation of similar sites
- Site has received SRCO
HASSCO Rehabilitation Site - Jacksonville
Background

• Site is former 40 acre landfill in fast growing area of Jacksonville
• Site placed on “Lands Available” list with City of Jacksonville for nonpayment of taxes
• Landfill closed in 1971, unlined
• Densely vegetated, wetlands former from settlement of wastes (50% of site now wetlands)
• Soil and groundwater contaminated with metals and volatile compounds
• Methane present
Brownfield Solutions

- Grub and regrade or maintain landfill cap (engineering control)
- Reduce stormwater percolation through waste through stormwater control (lined and unlined ponds)
- Design for and construct stormwater controls for build out conditions
- Health and Safety Plan for Site workers
- Plans for utility corridors
- Dewatering plan
Results

- First approved redevelopment of landfill in FDEP Northeast district
- First application of lined pond on top of landfill in State of Florida
- Reduced groundwater contaminants below drinking water standards within two years
- Construction completed in 2009
Exercise and Questions and Answers
Exercise

- 60 acre parcel
- Up to 40 acres operated as a MSW landfill
- Currently operated as a driving range
- Landfill closed in late 1970s with 2 foot cap
- Groundwater monitoring for last 20 years
- Developer wants to construct apartments or warehouses on the property.
- Groundwater monitoring shows ammonia, iron, manganese and benzene
1969 Historical Aerial Photograph
Current Aerial Photograph
Brownfield Program and Design/Construction Components

• Brownfield Components
  ✓ Brownfield Area
  ✓ BSRA
  ✓ PRFBSR
  ✓ Tax credits and refunds
  ✓ Liability Protection
  ✓ Grants
  ✓ Contaminants
  ✓ Remediation

• Design and Construction Components
  ✓ Site Layout
  ✓ Stormwater
  ✓ Utilities
  ✓ Exposure to Occupants
  ✓ Grading
  ✓ Geotechnical
  ✓ Paving and Foundations
  ✓ Grubbing
  ✓ Dewatering
  ✓ Grading and Earth Work
  ✓ Health and Safety
  ✓ Utility Construction