



Sustainable Approaches for Reuse and Redevelopment of Closed Landfills in Florida: A Case Study

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What do these photos have in common?

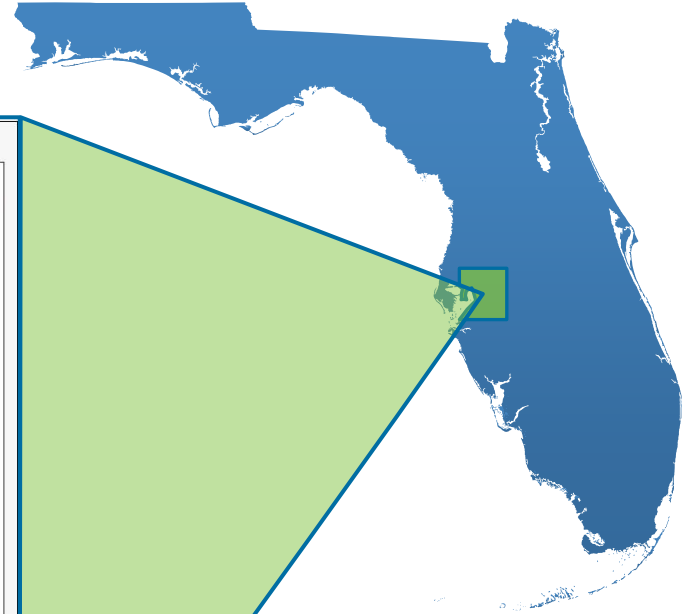
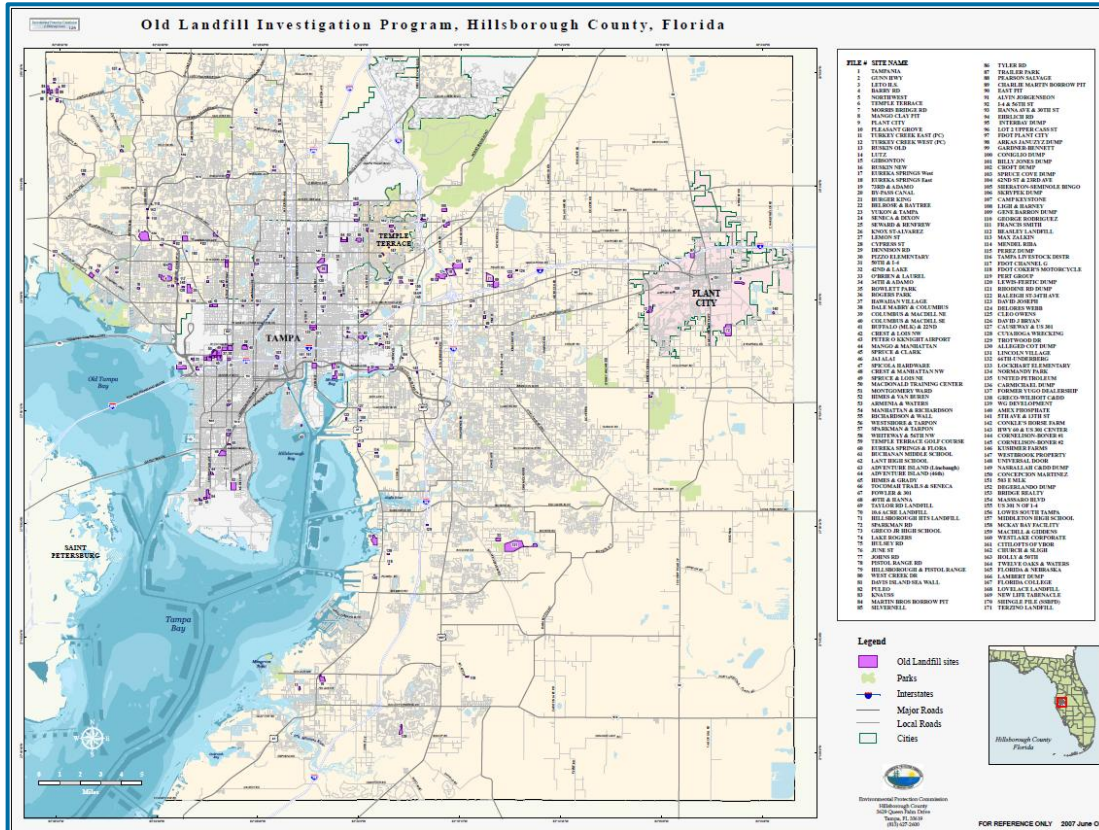


Overview of presentation

- Closed landfills in Florida
- Why recycle closed landfills
- Case Studies
- Lessons Learned



Local Old Landfills/ Abandoned Dumps



171
old landfills/abandoned
dumps identified

Source: Environmental Protection Commission – Hillsborough County

Old Landfills/Abandoned Dumps

<http://www.epchc.org/divisions/waste-management/solid-hazardous-waste/old-landfills-abandoned-dumps>



Why Recycle Closed Landfills

- ✓ **Value of land**
 - Suburban areas are expanding; Sites exist in former rural areas
 - New land uses/applications (buildings, infrastructure, solar and wind power applications, etc...)
- ✓ **Value of buried disposed recyclables**
 - Mining, processing, and marketing/selling recyclables has become more feasible
- ✓ **Landfill Management/Compliance**
- ✓ **Cost savings from reduced post closure care monitoring**
- ✓ **Environmental benefits (reuse of land, reuse of recyclable materials, etc...)**
- ✓ **Health and Safety (improved controls)**





Why recycle closed landfills

Why Recycle Closed Landfills

- Redevelopment for Residential/Commercial use has increased over past several years throughout Florida
- Sites exist in areas that were once rural, but are now part of the suburbs
- “Problem” sites are becoming more desirable
- Stigma associated with blighted properties has diminished for many



Value of Land

Why Recycle Closed Landfills

- **FDEP Rule 62-701.730 Construction and Demolition Debris Disposal and Recycling**
 - Mandated material recovery
 - Certified evaluation of economic feasibility
- **Buried materials provide value for redevelopment**



Value of buried disposed recyclables


Why Recycle Closed Landfills

Regulatory Approvals

- Post Closure Care regulations
- Permitting
- Financial Assurance obligations
- Liabilities
- Incentive programs
- Remediation options

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December 22, 2017

Authorization #:	EPC/DA-OLC-102717
Authorization Date:	DEC 22, 2017
Expiration Date:	DEC 22, 2018
Sec/Twn/Rge:	10/27/18
Tax Folio(s):	013291-0000

PROJECT DESCRIPTION: AVOCET DRIVE, LUTZ, HILLSBOROUGH COUNTY, FLORIDA.

I. Applicability:

This Authorization, issued pursuant to Chapter 84-446, Laws of Florida, as amended, and Chapter 1-7, Rules of the Environmental Protection Commission (Commission) authorizes the above named party to perform the work shown on the application and approved drawing(s), plans and other documents attached hereto or on file with the Commission and made a part hereof, generally described as follows:

1. Excavation of buried solid waste and soils which are impacted in exceedance of Residential Use Based Soil Cleanup Target Levels (associated soils) from historic solid waste disposal areas within the property boundaries;

Landfill Management/Compliance

Why Recycle Closed Landfills

Environmental Regulations Related to Waste Disposal Areas in Florida

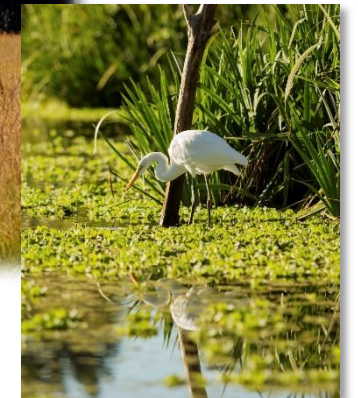
- **Leachate**
 - Lined vs. Unlined
 - Leachate during construction
- **Gas**
 - Active/Passive Recovery Systems
 - Will Development Facilitate Gas Accumulation
- **Groundwater**
 - Is Groundwater Impacted?
 - Is groundwater quality adequately Characterized
- **Landfill Cover**
 - Exposure
 - Settlement



Cost savings from reduced post closure care monitoring costs

Why Recycle Closed Landfills

- Offer compliance for facilities that may be out of compliance
- Improved Aesthetics
- Habitat Restoration



Environmental Benefits

Why Recycle Closed Landfills

- Improved Controls
- Trespassing
- Health Risks
- Gas migration



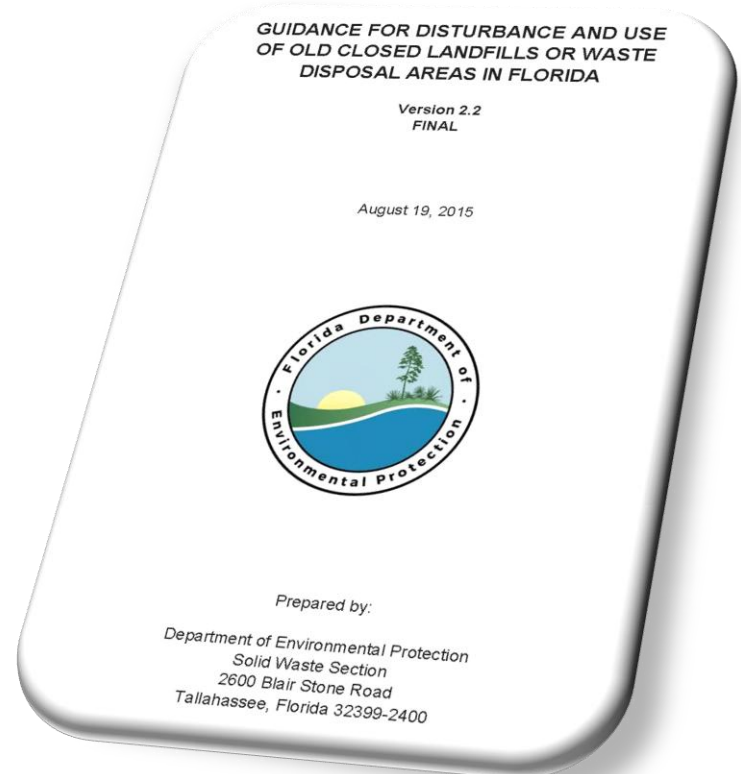
Health and Safety

Regulatory Oversight in Florida

Florida Department of Environmental Protection

“Guidance for Disturbance and Use of Old Closed Landfills or Waste Disposal Areas in Florida” August 19, 2015

- Waste relocation
- Waste left In-Place
- Waste Removal and Offsite Disposal
- Recycling Wastes and Vegetative Matter
- Use of Screened Solid Waste
- Water Quality Evaluations
- Construction Near Waste-filled Areas
- Construction Over Waste-filled Areas





Case Studies

Case Study 1 - Former Tampa Jai Alai

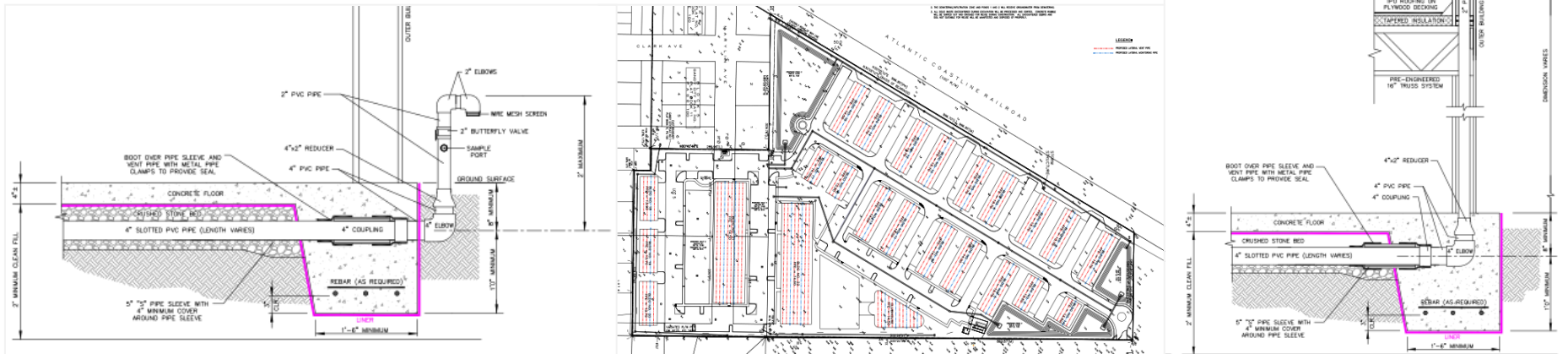
Former City of Tampa Landfill

- 13.09 Acres
- Primarily C&D Materials
- Proposed Multifamily
- Hillsborough County EPC Director's Authorization
- Initial Application Submitted July 2014
- Several Redesigns of Site and Wetlands Permitting
- Permit (DA) Issued March 2016



Case Study 1 - Former Tampa Jai Alai

- **Leachate**
 - Unlined Facility, but leachate control required during RSM processing. Stormwater Controls (Lined Ponds)
- **Gas**
 - Venting Under Buildings and Monitoring
- **Groundwater**
 - Arsenic and TDS
- **Cover**
 - RSM will be Processed and reused under Asphalt



Case Study 1 - Former Tampa Jai Alai

Challenges

- **Geotechnical Issues**
 - Slab design over waste
- **RSM Quality**
 - Well over 5% Organics make reuse difficult
- **Dewatering**
 - Unknown quantities of water (large voids)
- **Venting**
 - Passive with ability to go active quickly
- **Adjacent properties with Waste**



Case Study 1 - Former Tampa Jai Alai

Outcomes

- Reuse of former blighted property
- Increase in tax base for City of Tampa
- Recovery and Recycling of Landfill Materials
 - On-site Reuse
 - RSM in perimeter greenspaces
 - Crushed concrete for structural fill
 - Former landfill cover for structural fill
 - Off-site recycling
 - Scrap Metal
 - Mulch
- Compliance with current regulations (County/State)
- Improve groundwater quality by removing waste
- Trespassers/Hazards removed
- Brownfields designation

Case Study 2 – Shredder Residue Landfill (Texas)

Mining of former Shredder Residue Landfill

- Active landfill which is short on capacity in remote area
- Evaluation of landfill mining to increase capacity versus alternative disposal site
 - New technologies capable of material recovery (bench-scale)
 - Mining allows increased capacity at existing landfill
 - Revenue source offset costs of mining and processing buried materials
 - Same equipment used for mining and processing of new material



Case Study 3 – Millersville Landfill (Maryland)

Mining of former municipal solid waste landfill

- Cell 1 East
- Considered partial and full mining of 15-acre cell
- Increase capacity for adjacent yard waste facility
- Schematic Design Report
 - Material recovery technologies
 - Regulatory approvals
 - Extent/volume of materials
 - Disposal options
- 25% Recyclables (100,000 CY)
- Tires/metal/stumps/concrete
- Clean Cover



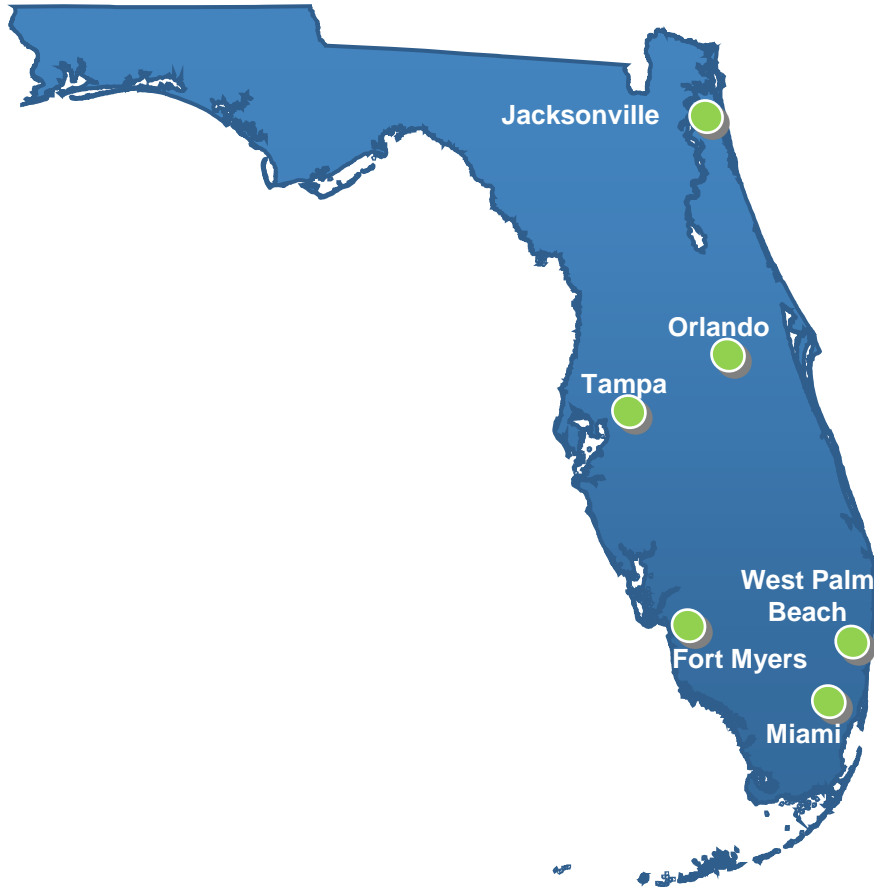
Lessons Learned

Considerations for Developers/Owners

- Is landfill permitted or unpermitted
- Communicate with Regulators early in the process
- Include community in decision making process early
- Investigate opportunities to maximize site use and materials recovery
- If an unknown facility, important to characterize the material
- Utilization of site should be conceptualized early, well in advance of site closure when possible



Questions/Contacts



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