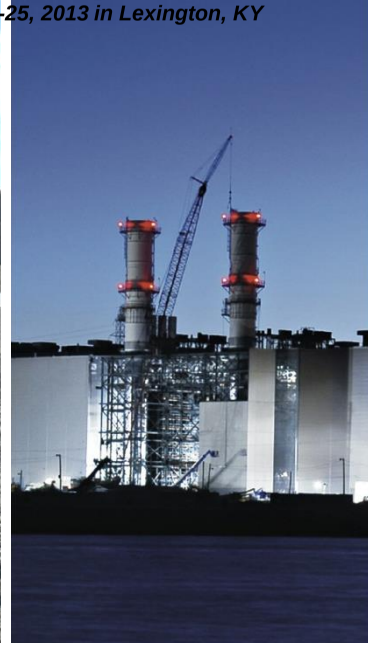



TVA URS

World of Coal Ash

CCP Landfill and Dry Stack Operational Challenges and the Engineering Solutions that Work

Prepared by: Shane Harris - TVA
Michael Stepic, PE –URS
Ronald Hager – URS
Nick Golden, PE – URS

April 25, 2013

Presentation Outline

- TVA's Program Goals
- Address Significance of the Topic
- Operational Topics
  - Improvements Implemented and Lessons Learned
  - Success Factors and Value Added
- Summary

CCP Landfill and Dry Stack Operations Programmatic Goals of TVA

- Upfront Planning
- Engineered Controls
- Training
- On-going Monitoring of Operations
- Stability and Safety of Facilities

What Makes This Topic Significant?

- Environmental and Permitting Compliance
  - Adherence to permits and environmental standards
  - Avoidance of permit violations
- O&M improvements
  - Reduction in maintenance issues (time and money)
  - Efficient Operations
- Effective Compliance with Design
  - Site performance consistent with design
  - Avoidance of stability and similar issues
  - Contact water/Leachate generation minimization/storm water segregation
- Cost Reductions
  - Reduction in significant correctable maintenance
  - Improved and efficient operations = cost efficiency (and predictability)

Operational Topics Overview

- Phased Development
- Surface Water Management, Drainage and Erosion Control
- Leachate Management
- Intermediate Cover
- Closure
- Survey Control
- Dust Control
- Compliance Monitoring

…. presented in greater detail over the following slides by addressing the improvements implemented and the lessons learned.

Improvements/Lessons Learned – Phased Development

- Improvements Implemented/Lessons Learned
  - Development of detailed ‘stacking plans’ providing details for operational control
  - Developed in appropriate software to allow for surface control to readily available
- Success Factors and Value Added
  - More efficient utilization of designed and permitted facility
  - Allows for better long-term planning and operational projections
  - Ability to plan for closure appropriately thus reducing areas to be maintained
    - Active area = Operational needs
  - Reduces high capital expenses in an overall cash flow

Improvements/Lessons Learned – Surface Water/Erosion

- Improvements Implemented/Lessons Learned

Shedding water off the stack is the biggest problem related to operations maintenance. Correctly sizing and grading the benches is key. Here, TVA completely re-grade an existing bench.

- June 2012

- June 2012

Improvements/Lessons Learned – Surface Water/Erosion

- Improvements Implemented/Lessons Learned

The haul road was never graded to drain and therefore created an uncontrolled situation. After a minimal rain, crews spend hours repairing the road so ash can be hauled.

- Sept 2011

- Sept 2011

Improvements/Lessons Learned – Surface Water/Erosion

- Improvements Implemented/Lessons Learned

The haul road was never graded to drain and therefore created an uncontrolled situation. After a minimal rain, crews spend hours repairing the road so ash can be hauled.

- Nov 2010

- Aug 2011

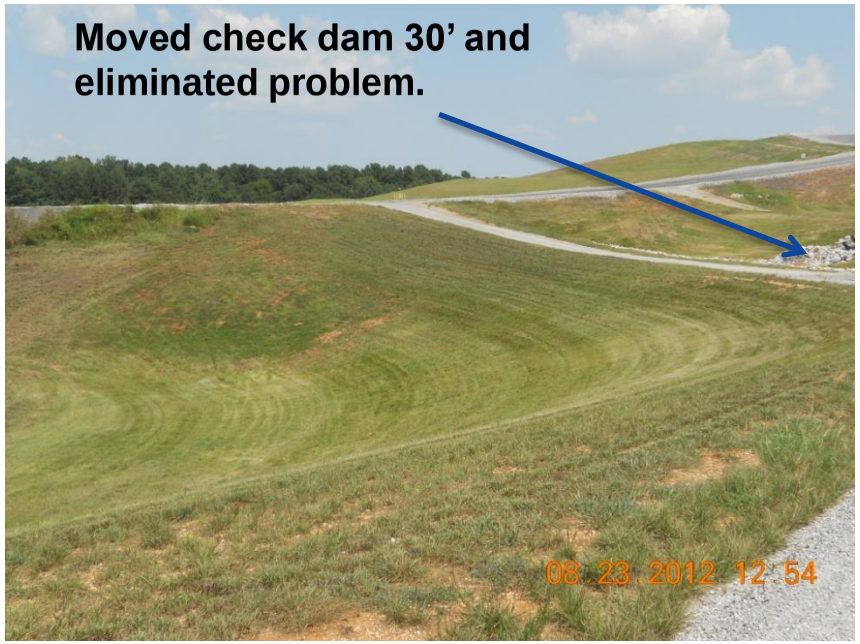
Improvements/Lessons Learned – Surface Water/Erosion

- Improvements Implemented/Lessons Learned

Photo on left taken November 2010, exhibits erosion. Photo on right taken August 2012, area has been re-graded, seeded, and vegetation has developed, therefore mitigating previous erosion issue.

- Nov 2010

- Aug 2012



Improvements/Lessons Learned – Surface Water/Erosion

- Success Factors and Value Added
  - Evaluate adequacy of existing system
  - Prioritize areas of concern
  - Fix areas of concern at the source
    - Stabilize exposed surfaces, identify areas requiring frequent maintenance
    - Provide additional engineering solutions for areas requiring frequent maintenance
  - Monitor storm water conveyance structures regularly
  - Maintain and improve terraces and other features as appropriate
  - Be proactive/not reactive
  - Identify practices that minimize maintenance/costs
    - Higher $ today saves bigger $$ tomorrow

Improvements/Lessons Learned – Surface Water/Erosion

- Success Factors and Value Added
  - Identify potential amendments to soil being stabilized
  - Select appropriate native vegetation species
  - Provide appropriate thickness of nutrient rich soil
  - Develop and maintain effective vegetation (address any areas not responding)

Improvements/Lessons Learned – Leachate Management

- Improvements Implemented/Lessons Learned
  - Re-evaluate system design and management of contact and non-contact water to minimize volumes generated
  - Standardize system components across facilities to provide efficiencies in maintenance, inventory of replacement parts, and applicable vendor interaction
  - Develop a standardized approach to maintenance to avoid system issues
- Success Factors and Value Added
  - Minimize volume of water to manage by operational changes
  - Minimize operational (“disposal”) area
  - Evaluate collection, conveyance, and storage methods
    - Regularly clean conveyance system to avoid build-up
    - Regularly maintain system components

Improvements/Lessons Learned – Intermediate Cover

- Improvements Implemented/Lessons Learned

Water was eroding the slopes that was collecting on top of the stack. The solution was install appropriate intermediate cover, vegetate and manage and control storm water appropriately to a designated discharge point.

- Sept 2010

- July 2011

Improvements/Lessons Learned – Intermediate Cover

- Success Factors and Value Added
  - Reduced generation of contact water/leachate
  - Reduced maintenance/Reduced erosion
  - Reduced seepage and outbreak potential
  - Reduced potential for slope failures
  - Reduced fugitive dust generation
  - Good housekeeping/Cleaner operations/Perception of environmental stewardship

Improvements/Lessons Learned – Closure

– Improvements Implemented/Lessons Learned

Bottom left shows existing conditions. Better closure practices were needed. The existing material was not capable of sustaining vegetation. Bottom right shows the installation of cover soil capable of growing grass.

- March 2011

- March 2011

Improvements/Lessons Learned – Closure

- Improvements Implemented/Lessons Learned (cont'd)

Same bench before and after with no work performed. Note the dates. Patience is rewarded. Getting a good stand of vegetation takes time.

- Sept 2011

- March 2012

Improvements/Lessons Learned – Closure

- Success Factors and Value Added
  - Reduced long-term maintenance
  - Reduced permitting requirements
  - Reduced financial risk
  - Lower long-term monitoring requirements and related costs
  - Establishment of additional “green” areas

Improvements/Lessons Learned – Survey Control

- Improvements Implemented/Lessons Learned
- Spend the money to do it right. Much easier to perform correctly than repair.
- Success Factors and Value Added
  - Develop appropriate survey control
  - Acquire and utilize proper equipment (GPS, Rover, etc…)
  - Identify and understand site specific datum
  - Establish permanent and accessible benchmarks near the site
  - Incorporate survey control into operational plans
  - Minimize liability – something to refer back to
  - Establish and implement frequent survey verification
  - Development of standards for as-constructed documentation
  - Follow the plans – don't field engineer or you may end of with the same problems!

Missed a bench. Had to correct. Did not have GPS equipment at that time. Now they do!

Improvements/Lessons Learned – Dust Control

- Improvements Implemented/Lessons Learned
  - OK to experiment here. Most visible nuisance for ash stacks. MUST control!
- Success Factors and Value Added
  - Environmental Compliance
  - Health and Safety considerations mitigated
  - Cleaner operations results in:
    - Higher perception of Environmental Stewardship
    - Reduction of risk to offsite or onsite exposures

Improvements/Lessons Learned – Compliance Monitoring

- Improvements Implemented/Lessons Learned
- Success Factors and Value Added
  - Regulatory Compliance
  - Development of database to identify changes in a facility
  - Identify potential areas of concern early
  - Document the success of an operation
  - Provide a clear perception of environmental stewardship

Summary

- Be proactive in identifying and resolving issues
  - Routine inspections by trained personnel (document findings) can identify problems early
  - Follow up with solutions for items identified
- Investing in O&M improvements today results in cost savings tomorrow
- Fix areas of concern at the source
- Develop and implement engineered solutions

Summary (cont'd)

- Establish and manage survey control
- Periodic survey verification
- Evaluate current status of operations and maintenance
- Develop and implement an effective operations plan

Be diligent, take it seriously, be methodical, always look for improvement

Contact Information

TVA
Shane Harris
rsharri0@tva.gov
(423) 260-9640

URS
Mike Stepic, PE
michael.stepic@urs.com
(330) 800-2725

Question and Answer