Introduction

Michelle Spruth – APTIM
• Project Manager
• 22 years experience in Solid Waste Development and Design

Leonard Dougher – APTIM
• Construction Technical Services Manager
• 24 years experience in Environmental Construction
Introduction

- CB&I’s Capital Services Division, which included CB&I Environmental and Infrastructure, was recently purchased by Veritas Capital who in turn rebranded Capital Services as APTIM.
- APTIM is a standalone, independent company which provides construction and engineering services for the power sector.
- APTIM self-performs most aspects of Civil and Environmental Engineering and Construction.
- APTIM employees draw from a long history of experience and qualifications in the industry.
Environmental Control Design for Stormwater Management
Introduction

What is Stormwater?

- Stormwater Runoff is rain or snowmelt that flows over land and does not percolate into the soil.

- Stormwater runoff occurs naturally, in small amounts, from almost any type of land surface, especially during larger storm events.
Introduction

Why is Stormwater Quality Important?
• As stormwater runoff moves across surfaces, it picks up trash, debris and pollutants, such as sediment, oil and grease, pesticides and other toxics.
Regulatory Framework

NPDES Program

- The United States Environmental Protection Agency’s (EPAs) Clean Water Act (CWA) requires a National Pollutant Discharge Elimination System (NPDES) Permit for construction activities that disturb 1 acre or more.
- Most states are authorized to issue their own permits for stormwater discharges associated with construction activities, including Kansas, Missouri, and Oklahoma.
- Because each state develops its own NPDES program, you should read and understand your state’s specific general permit.
Regulatory Framework

**Kansas NPDES Program**

- Construction activities that disturb 1 or more acre must have authorization to discharge stormwater runoff under construction.
- Application is made by completing a Notice of Intent (NOI). Submitted 60 days before construction.
Design

- **Developing a Stormwater Pollution Prevention Plan (SWPPP)**
  - The SWPPP is a living document.

- **Objectives**
  - Site stabilization.
  - Protect slopes and channels.
  - Reduce impervious surfaces to promote infiltration.
  - Control the perimeter of the site.
  - Protect receiving waters adjacent to the site.
  - Drawings/ Figures.
Best Management Practices (BMP)

- **Effective Erosion and Sediment Control**

- **Erosion Control**
  - Minimize disturbed area and protect natural features and soil.
  - Phase construction activity.
  - Control stormwater flow.
  - Protect slopes.

- **Sediment Control**
  - Protect drains and inlets.
  - Establish perimeter controls.
  - Retain sediment on-site and control dewatering practices.
  - Establish stabilized construction exits, inspect and maintain controls.
Best Management Practices (BMP)

- **Good Housekeeping Measures**
  - Provide for waste management.
  - Establish staging areas.
  - Establish fueling and maintenance practices.
  - Control non-stormwater discharges.
  - Development of a spill prevention and response plan.
Spill Prevention, Control and Countermeasure (SPCC) Plan

- Construction sites may be subject to 40 CFR Part 112 regulations that require the preparation and implementation of a SPCC Plan to prevent oil spills from storage tanks.
  - Storage capacity > 1,320 gallons or buried storage of >42,000 gallons
  - Could reasonably be expected to discharge oil in quantities that may be harmful to navigable waters of the United States and adjoining shorelines.

- Inspections, Maintenance and Recordkeeping
Common Compliance Issues on Site:

- Not using phased grading or providing temporary or permanent cover.
- No sediment controls and temporary stockpiles.
- No inlet protection.
- No BMPs to minimize vehicle tracking onto road.
- Improper solid/hazardous waste management.
- Dewatering and other pollutant discharges at the construction site.
- Poorly managed washouts.
- Inadequate BMP, documentation or training.
Conclusions

Keys to a Successful Project

- Proper planning
- Well trained employees and subcontractors
- Implement Plans before construction.
- Conduct Inspections and Maintenance of BMPs
Environmental Control Installation
Installation of Environmental Controls

- Project Planning
- Construction
- Operation and Maintenance
Planning
Planning

Points to consider during project planning
- Design review and takeoffs
- Equipment selection
- Submittals
- Procurement
Design Review and Takeoffs

Planning

- Understand what features need to be installed
- Perform takeoffs to identify material quantities
  - AutoCAD
  - Scale off construction drawings
  - Field measurements
- Review access and any preparatory work that may be required
  - Do access roads need to be constructed?
  - Is clearing required?
- Develop a schedule for installation
  - Understand sequencing
Equipment Selection

Determine types and sizes of equipment required for installation

- Standard Equipment
  - Excavator
  - Loader / Skid Steer
  - Dozer
  - End dump

- Specialized Equipment
  - Trenching machine
  - Skid steer attachments
  - Tracked end dump
Submittals

Prepare submittals for Engineer review and approval

- Materials and aggregates
- Shop drawings
- Installation guidelines
Procurement

Order materials following appropriate procurement procedures
  • Evaluate lead times for materials
  • Coordinate deliveries to meet installation schedule

Receive and store materials
  • Verify that materials correspond to approved submittals
  • Unload and store materials properly
Construction
Construction

Steps for Environmental Control Installation

• Training
• Preparatory meeting
• Layout
• Clearing and access improvements
• Installation
• Verification and as-buils
Training

- Ensure that all employees are properly trained and understand the specific task
- Prepare a Job Hazard Analysis (JHAs) as part of the Health and Safety Plan
- Prepare Job Safety Analysis (JSAs) daily and review with crew at the morning safety meeting
  - Written with crew input
  - Revised during the day based on any changes to tasks or site conditions
- Site specific training on the use of any new or specialized equipment
Preparatory Meeting

- Involves Contractor, Engineer, Owner and any other applicable parties
- Items for review
  - Scope of work
  - Submittals
  - Materials and equipment
  - Construction approach
  - Health and safety requirements
- Helps to identify potential issues prior to start of construction
Layout

- Survey layout of features to be installed
  - Ensure proper location, alignment and grades
- Help identify any conflicts between the design and field implementation

Construction
Clearing and Access Improvements

Clearing and Grubbing

• Equipment
  - Chain saws
  - Excavator with thumb attachment
  - Root rake attachments

• Disposal – Offsite or stay onsite
  - Chipper
  - Tub grinder
Clearing and Access Improvements

Access Improvements

- What type of access is required
- Can range from minimal grading to building access roads
- Ramps may be required on steep slopes
Installation

- All work is to be performed safely
- Features are installed correctly and accurately
- Follow proper sequencing
Verification and As-builts
Construction

- All features should be inspected to verify and document that they are installed properly.
- Collect as-built information on installed features for record drawings.
Operation and Maintenance
Operation and Maintenance

- Inspections
- Repairs
- Improvements
Inspections

- Develop an inspection schedule
  - Weekly
  - After any weather events
  - In accordance with regulatory guidelines

- Person conducting inspections is to be qualified or certified

- Document inspections, deficiencies and follow up remedies
Repair environmental features promptly and maintain continuously

- Clean out sediment buildup on a regular basis
- Repair any features that are damaged or not working properly
- Maintain a stockpile of materials and aggregates for repairs
Improvements

Operation and Maintenance

- Monitor environmental control features for functionality
  - Visually inspect during or just after weather events
    - Are they working properly?
    - Is water diverting around features?

- Coordinate with the Engineer to develop and implement remedies
  - Approach issues as a cooperative effort

- Make modifications as appropriate
  - Increase size or design of feature
  - Adjust the features location
Environmental Control Features
Silt Fence
Diversion Channels and Down Chutes
Outlet Protection
Sediment Traps and Basins
Conclusions

Keys to a Successful Project

- Proper planning
- Strong and active health and safety program
- Well trained employees
- Correct equipment selection
- Identify issues and develop solutions as a group effort