Introduction

- Overview of the Port of Long Beach
- Review of Sustainability Initiatives and Programs
- Challenges Adapting Sustainability to Engineering
- Using an EMS to integrate Sustainability
POLB Overview

- 3230 Acres
- 7 Container Terminals
- 80 berths
- 76-foot-deep main channel
- 72 post-panamax cranes
- 2007 Cargo
  - 7.3M TEUs
  - $140B value
World’s Top Container Seaports

2007

1. Singapore
2. Shanghai
3. Hong Kong
4. Shenzhen, China
5. Long Beach/L.A.
6. Long Beach

*Twenty-foot-equivalent units (TEUs)
San Pedro Bay Cargo Forecasts - Actual vs. Forecasted TEUs* (Loaded and Empties)

*TEU's - Twenty-foot equivalent units

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2008 Forecast: 36.8 million TEUs

Actual: 36.8 million TEUs
Port’s Response to Growth Trends

- **Efficiency Improvements**
  - Technology
  - Densification
  - More On-Dock rail

- **Capital Improvements**
  - Terminal Expansions
  - Infrastructure and Navigation Projects
  - Rail Enhancement Program

- **Revised EIR Processes and Mitigations**
  - Clean Air Action Plan (CAAP)
  - Throughput Limitations
  - Cold Ironing

- **Green Port Policy**
Green Port Policy

GREEN PORT POLICY

• Protect the community from harmful side effects of Port operations
• Distinguish Port as leader in environmental stewardship and compliance
• Promote sustainability
• Employ best available technology to minimize environmental impacts
• Engage and educate the community

SIX KEY STRATEGIES

AIR  WATER  WILDLIFE  SOIL/SEDIMENT  SUSTAINABILITY  COMMUNITY ENGAGEMENT
The Triple Bottom Line

- Economic Benefit
- Social Responsibility and
- Environmental Accountability
Clean Air Action Plan Strategies

- Clean Trucks Program
- Clean Vessels Program
  - Vessel Speed Reduction
  - Alternative Fuels
- Shore-side power for ships
- Clean Locomotives Programs
- Clean Cargo Handling Equipment
- Clean Harbor Craft
- Tariff changes
- Incentives/Voluntary measures
- Alternative technology Program
- Reduce pollution by 45% within five years
Other Sustainability Programs

• Green Port Integrating Committee
  – Reincarnation of Sustainability Task Force
• Green Leases
• Solid waste recycling programs
• Green Port Fest
• Educational Partnerships
• “Let’s Talk Port” Community Outreach
• Urban Reforestation Program
• Sustainable Landscaping Palettes
Transporting Sustainability from Environmental to Engineering

• General perception
  – Sustainability is primarily an environmental program
• Implementation centers on environmental issues first
• Sustainable environmental initiatives evolve into sustainable operations
• Sustainable operations requires sustainable engineering practices
• Sustainable development focuses on the building industry
  – Commercial and residential accounts for 40% of total US energy consumption
• What about Sustainable Infrastructure?
• How do we apply sustainability to the engineering environment?
Port Engineering Applications

- LEED “Green Building” Program
- Materials Recycling/Reuse/Reduction
- Railroad Sustainability Standards
- “Green” Construction Methodologies
- Engineering Bureau Purchasing and Procurement Environmental Management System
LEED “Green Building” Program

- City of Long Beach Green Building Ordinance
- Security Command and Control Center
- New Port Administration Building/Maintenance Facility Complex
  - Gold certified
- Pier G Silver LEED Terminal
  - All buildings Silver LEED Certified
- Targeted Effect:
  - Energy Efficiency → reduction in greenhouse gases
  - Green energy
  - Water conservation
  - Stormwater Management
  - Resource conservation
Materials Recycling/Reuse/Reduction

- Operational recycling programs
  - Office paper, cardboard, magazines, food/beverage containers
- Construction Waste Recycling Program
  - COLB ordinance (60% diversion from landfill)
  - LEED points (90%+ achievable)
  - Specs require recycling of concrete, asphalt & rock rubble
  - Soil import/export guidelines
- Locally purchased materials
- Recycled building products
- Reused materials
- Targeted Effect:
  - Materials conservation
  - Energy efficiency → reduction in greenhouse gases
  - Reduced resource consumption
Railroad Sustainability Standards

- $2B Rail Enhancement Program
- More on-dock and near-dock rail
- Truck trip reduction strategy relies on more rail
- Hybrid and alternative fuel locomotives
- Developing Sustainable Design Standards
  - Modeled after LEED Standards
  - Defining broad categories rather than individual points
  - Incorporate into design development process
- Targeted Effect:
  - Materials conservation
  - Hazard materials reduction
  - Air quality improvements
  - Energy use
Green Construction Methodologies

- Ultra Low Sulfur Diesel
- USEPA Tier 3 non-road standards equipment
- Fugitive dust controls
  - Soil stabilizers
  - Wheel washouts
  - Wind fencing
- Truck idling reduction measures
- Storm water management
  - SWPPP
  - BMP’s
Engineering Bureau Environmental Management System for Purchasing and Procurement

- Defining the “fenceline”
- “Greening” the Engineering Process
  - Materials Purchasing
  - PS&E’s on CD’s
  - Equipment, Vehicles and Supplies
- “Greening” the Engineering Product
  - Procurement of professional and construction services
  - Specification of construction products and methods
- Developed significant aspects
  - Air Emissions
  - Construction Waste
  - Contaminated Materials
  - Storm Water Management
- EMS Framework developed as a pilot project
- Reduced scope – addressed Storm Water Management in first round
Storm Water Management EMS Elements

- Construction SWPPP SOP
  - Increased inspections
  - Improved record keeping
  - Periodic auditing
- Design Phase SWM SOP
  - Design checklists for construction and operational BMP’s
  - Integrated into the design process
- Orphaned Areas/Inactive Construction Sites SOP
  - SWPP Capital Project for Orphaned Areas
  - Annual inventory of orphaned areas & inactive construction sites
Storm Water Management EMS Benefits

- EMS is a process driven system
  - Not performance based
- Systematic determination of environmental impacts
- Systemic structure addresses impacts throughout organization
- Example: SW Design Checklists
  - Requires designers and PM’s to address construction and permanent BMP’s in PS&E’s
  - Built into QA/QC process through audits
  - Non-conformances trigger continuous improvement cycle
  - Enhanced cooperation by defining roles & responsibilities between divisions
- Continuous improvement cycle applied to other aspects
EMS in the Engineering Environment

• Challenges
  - ISO 14001 procedures need to be adapted
  - Fencelines are “virtual”, not physical; difficult to define
  - Aspects in an engineering environment are vague and difficult to envision
  - Strict reliance on procedures may not fit an organization’s culture (process vs. results)

• Benefits to Engineering
  - Improved standardization of the design process
  - Improved QA/QC process enforced
  - Methodical implementation fits the engineering process
  - Business benefits can be extended to non-environmental aspects
  - Sustainability benefits can be systematically applied and measured
Summary

- EMS offers a structured and proven methodology for addressing environmental impacts
- Engineering fencelines are generally “virtual”, not physical
- EMS structure can be extended to business processes, particularly the engineering process
- Clearly defined roles and responsibilities enhances collaboration on projects
- Structured methodology can be applied to sustainability aspects and used for implementation
Thank You!