



**AMERICAN ASSOCIATION OF PORT  
AUTHORITIES  
PANEL DISCUSSION  
Storm Water Treatment  
Chicago, IL, September 16, 2014**

**MODERATED BY:**

**JOHN L. FIVEASH, SENIOR COUNSEL, LEWIS, LONGMAN  
& WALKER, P.A.**

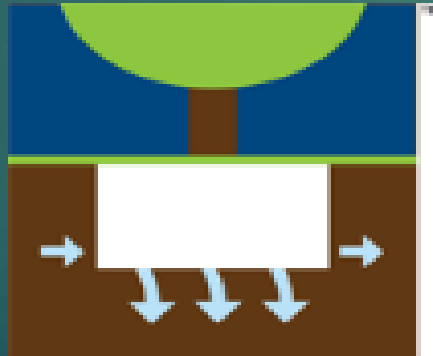
**JAY JAHANGIRI, REM, CESM, TRE CONSULTING, INC.**

# Panel Goals/Objectives:

- Present and moderate a roundtable discussion by diving deeper into treatment BMPs and their drivers, practical, technical, and legal considerations..
- Present & discuss what has and has not worked in treatment technology BMPs among representative Ports from the East, West, Gulf and in-between coasts.
- Discuss the IO&M Issues related to treatment BMPs, who is responsible to maintain them?
- Discuss the treatment BMPs as they relate to tenant community liability, challenges & opportunities.

# To Treat or not to Treat, that is the Question?

- ▶ Different Types of Treatment BMPs at Ports & Marine Terminals
- ▶ Physical Separation
- ▶ *Green Stormwater Infrastructure (GSI)?/Green BMPs*
- ▶ Bio-chemical Treatment Technology: flocculants



# Treatment BMP Drivers: “R&R”: Risk and Regulations:

- ▶ New generations of numerical based storm water permits with numerical action levels/limits
- ▶ High Risk:
- ▶ Scrap Metal Recycling
- ▶ Dry Bulk Terminals (Coal, Coke, Sulfur, fertilizers, aggregate, etc.)
- ▶ Liquid Bulk Terminals (petroleum, liquid fertilizers, etc.)
- ▶ Ship/Boat Repair Yards
- ▶ Other bulk Terminals
- ▶ Medium Risk:
- ▶ Container
- ▶ RORO
- ▶ Recreational Marinas
- ▶ Low Risk:
- ▶ Cruise
- ▶ Others

# Filtrations BMP Systems:

- ▶ Filtration Media: ZPGs, GAC, Volcanic Materials, etc.
- ▶ Experiences around the room, what has and has not worked? Limitations? Cost? Regulatory Acceptability?



Source: Contech Engineered Solutions

# Physical Separation: CDS Units

what has and has not worked? Limitations?

Cost? Regulatory Acceptability?

**CDS Unit**



Source: Port of Long Beach: James  
Vernon and Rick Cameron

# Green Treatment BMPs: Planter Roll Offs

What are the applications of Green BMPs? Do they work?  
Cost? Regulatory Acceptability? Limitations?



Source: Contech Engineered Solutions

# BIOFILTERS: LID Example

Applicability? Do they Work? Cost? Regulatory Acceptability?  
Limitations?



Source: Contech Engineeered Solutions



# Grass Pavers/Permeable Pavement

Are they applicable to port and in marine terminal settings?  
Cost? Regulatory Acceptability? Limitations?



Source: Contech Engineered Solutions

# Storm Water Detention: Marine Terminals Land is Valuable Space

Do they work? Cost? Regulatory Acceptability? Limitations?



# Storm Water Detention: Marine Terminals Land is Valuable Space

Do they work? Cost? Regulatory Acceptability? Limitations?

## ChamberMaxx

Corrugated, open-bottom arch systems designed to collect, detain, retain and infiltrate stormwater runoff



Source: Contech Construction Products



# Container Terminal and Rail Yard Treatment BMPs

Do they work? Cost? Regulatory Acceptability?



Source: StormwaterRX

# Tenant Community Liability Issues, Challenges & Opportunities: Municipal vs. Industrial

## Example: Scarp Metal Recycling Terminal

Do they work Cost? Regulatory Acceptability? How do you leverage treatment BMPs for tenant facilities.....? (port policy, tariffs, regs etc.....)

Benchmarks	TSS		COD		HEM		Al		Cu		Fe		Pb		Zn	
	100	120	120	120	15	15	0.75	0.75	0.0636	0.0636	1.0	1.0	0.0816	0.0816	0.117	0.117
Date	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
02/02/2014	-	13	-	41	-	ND	-	1.6	-	ND	-	0.5	-	ND	-	ND
02/06/2014	-	19	-	115	-	45	-	ND	-	ND	-	0.1	-	ND	-	0.1
02/06/2014	42	14	55	22	2.0	ND	0.6	0.6	0	0	0.7	0.4	0	ND	0.1	0
02/07/2014	330	160	460	630	8.4	4.9	0.7	0.1	0	0	1.0	0.1	0	ND	0.1	0
02/26/2014	48	ND	660	ND	1.4	ND	0.2	0	0	ND	1.1	ND	0	ND	0.7	0
02/28/2014	63	8	48	ND	2.4	ND	1.4	0.2	0	ND	1.7	0.2	0	ND	0.1	0.1
02/28/2014	320	20	200	27	-	-	4.2	0.3	0	0	4.7	0.4	0	ND	0.2	0.1
03/05/2014	-	4	-	50	-	43	-	ND	-	ND	-	ND	-	ND	-	0



# Inspections, Operations and Maintenance (IO&M) Challenges:

What are the IO&M challenges?

Who is Responsible to Maintain Them?

What are the legal and liability Implications?



Source: TRE Consulting, Inc

# Inspections, Operations and Maintenance (IO&M) Challenges?





# Conclusions

- ▶ Treatment BMPs are becoming increasingly required as the result of regulatory driving forces of the new generation of stormwater permits: numerical action limits.
- ▶ Treatment BMPs are also more prevalent in high and medium risk terminals....
- ▶ No silver bullet: for them to be fully successful: Integrated BMPs (education, good house keeping practices and source control, etc.)
- ▶ One size does not fit all and they vary from port-to-port, region-to-region, and terminal-to-terminal....