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: floculants
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?
Physical Separation: CDS Units
what has and has not worked? Limitations?
Cost? Regulatory Acceptability?
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


Source: Contech Engineered 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: StormwateRX
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.....)

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Source: StormwateRX
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?

Source: TRE Consulting, Inc
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 housekeeping 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....