

# Using Management System Concepts to Address Adaptation and other Sustainability Challenges

July 27, 2016

Elizabeth Delaney  
First Environment, Inc.

**“What’s past is prologue”**

**William Shakespeare**  
***The Tempest***

**“What’s past is past”**

**UNFCCC/IPCC**

***The Fifth Assessment***

“Continued emissions of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems”

# Presentation Roadmap

- External and organizational challenges
- A common management system approach
  - Risk assessment
  - Improvement vs. control
  - Monitoring
  - Corrections and adjustment
- Integrating and leveraging existing tools
  - EMS (ISO 14001)
  - Asset management systems

# External Challenges

- Climate change
- Sustainability
- Community expectations
- Regulations

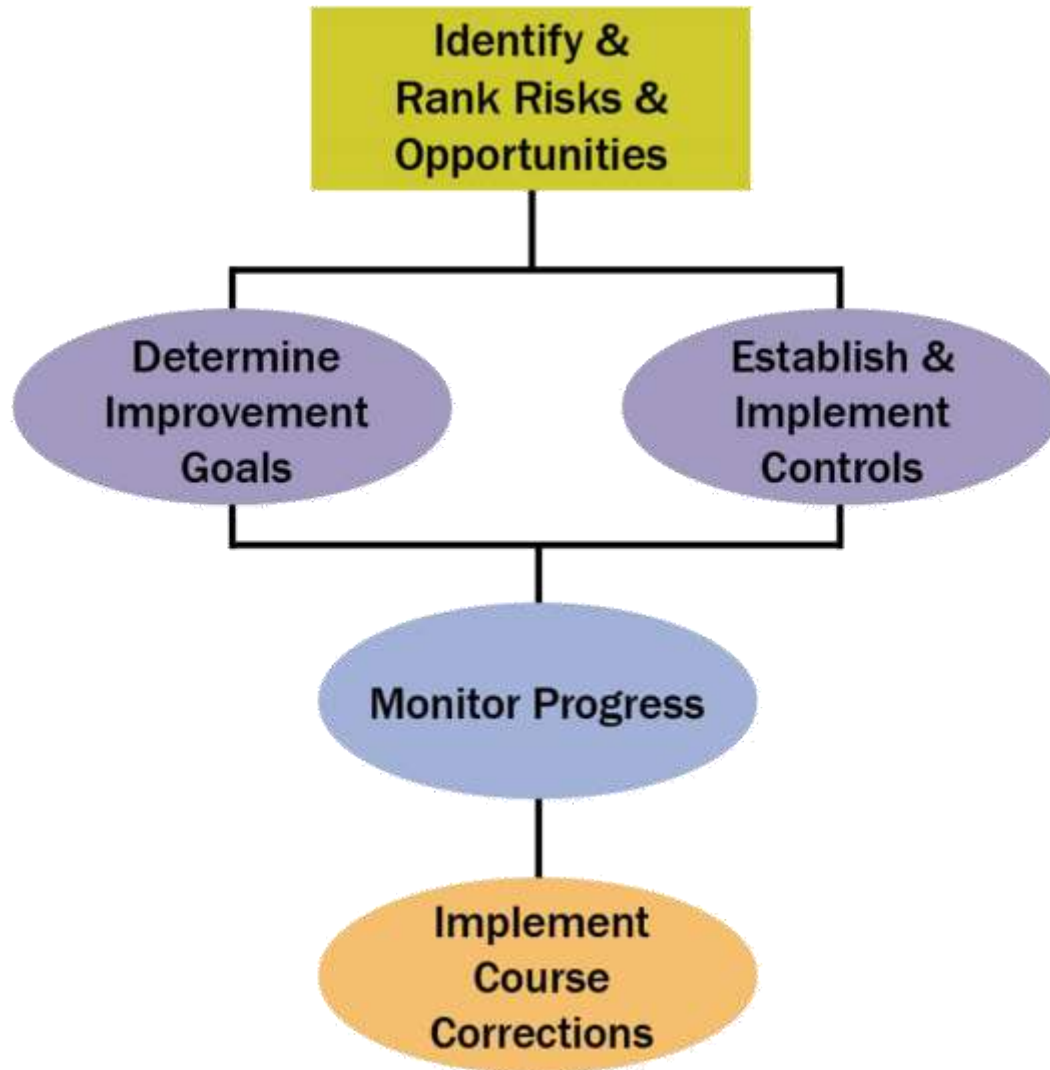
# Organizational Challenges

- What do these challenges even mean to my organization?
- Where does senior management stand? Middle management? Unions?
- How do I address them in my organization?
  - Penetration
  - Buy in
  - Efficiency

CHANGE!

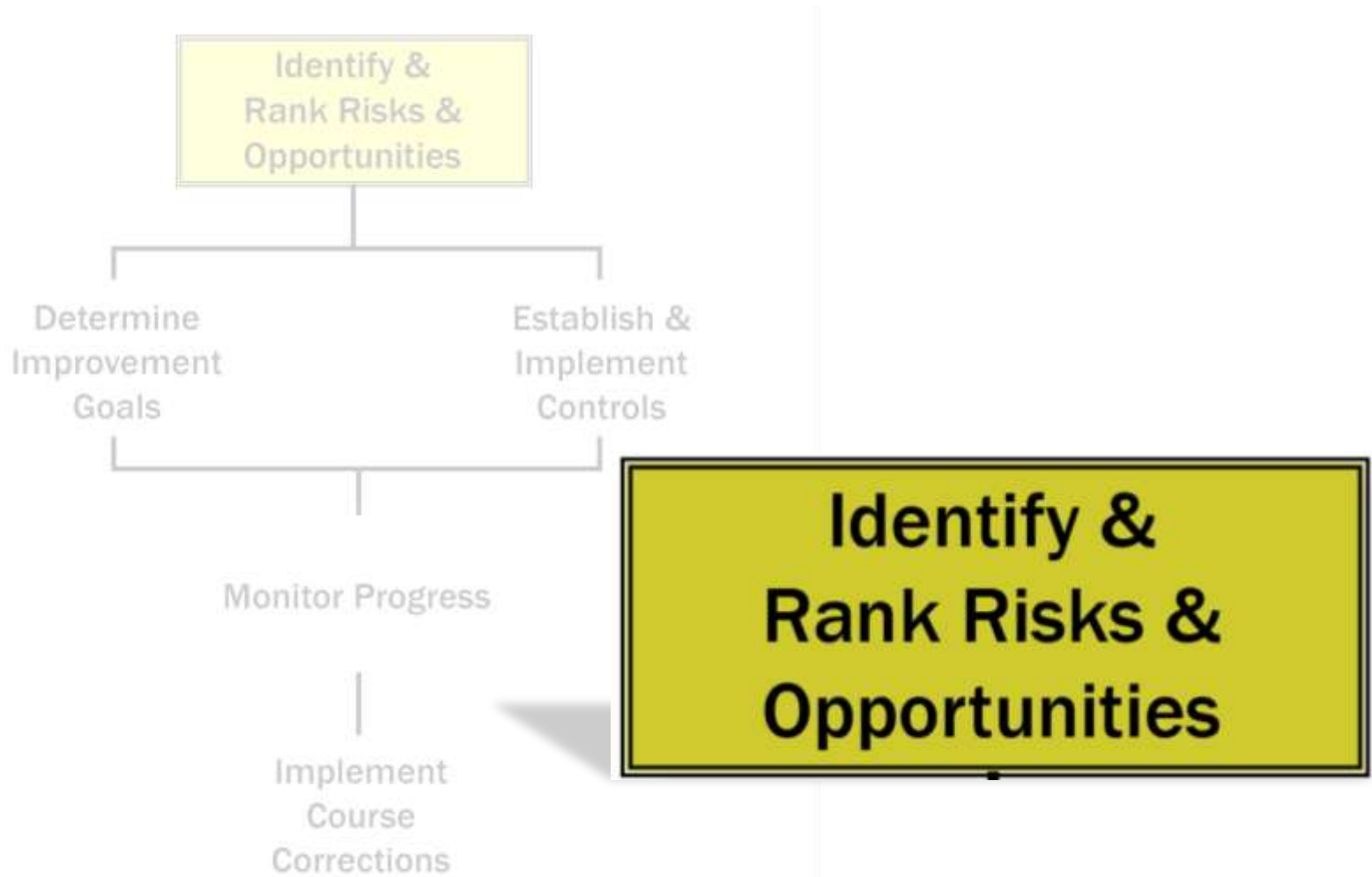


# Common Management System Approach





# Risks and Opportunities



# Risk and Opportunity Assessment

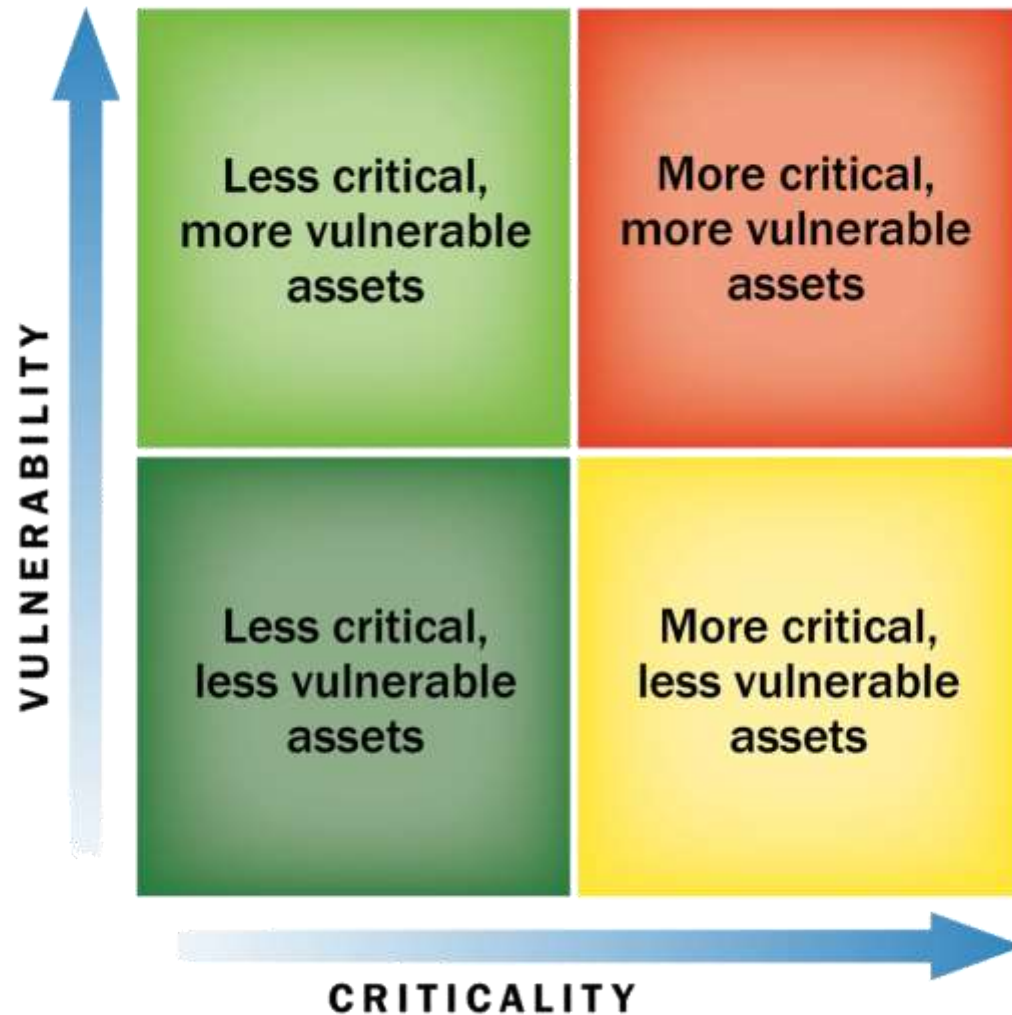
- Environmental aspects
- Climate change impacts
- Climate mitigation
- Sustainability

*Systematic, consistent, and  
sensible*

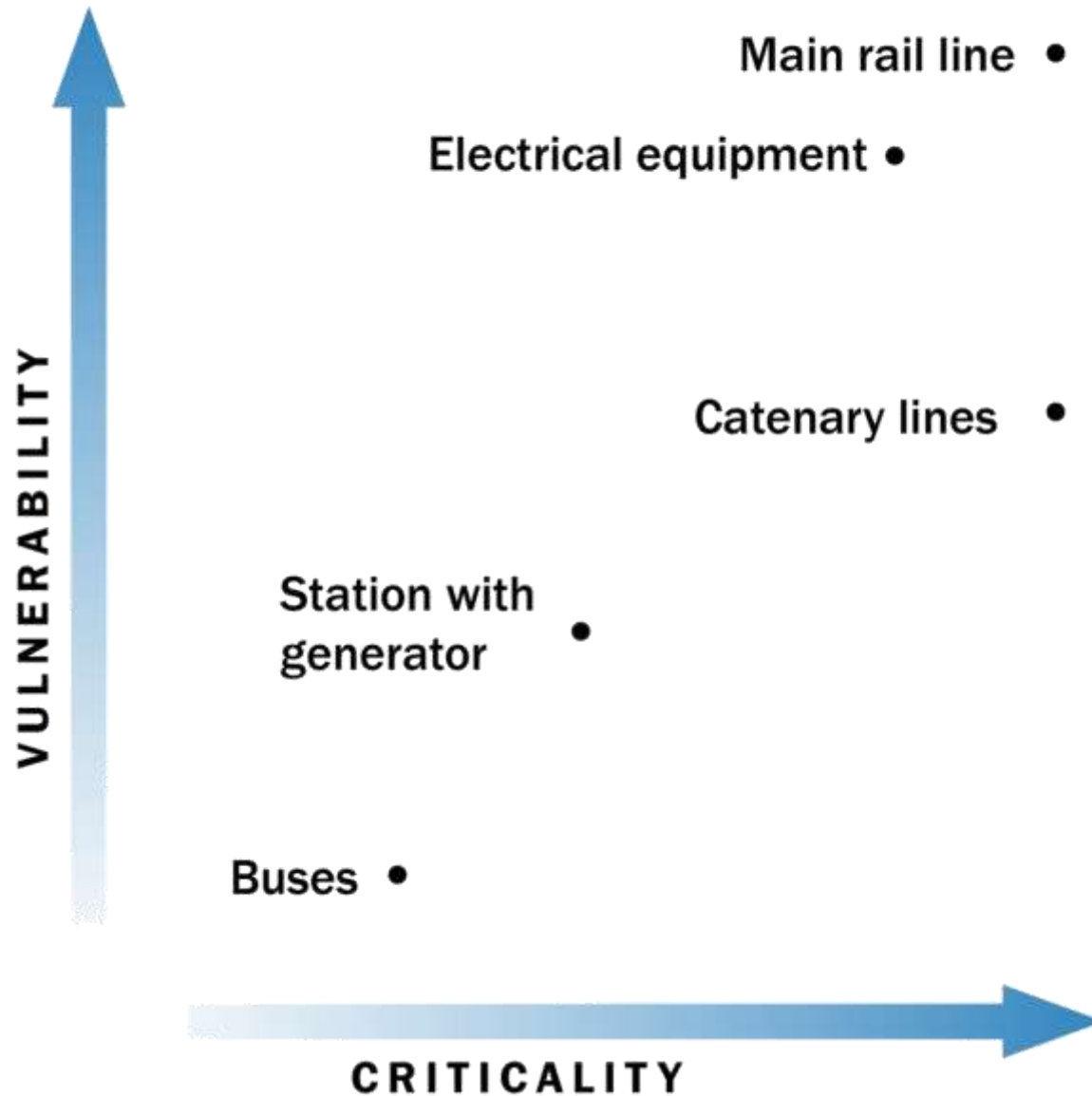
# Conceptual Risk-Based Approach to Address Adaptation & Resiliency

- Rely on climate science and models
- Understand your critical systems and the assets that make them run
- Understand the vulnerability of the assets in those systems to the likely climate change impacts they will encounter
- Focus on the most critical and vulnerable

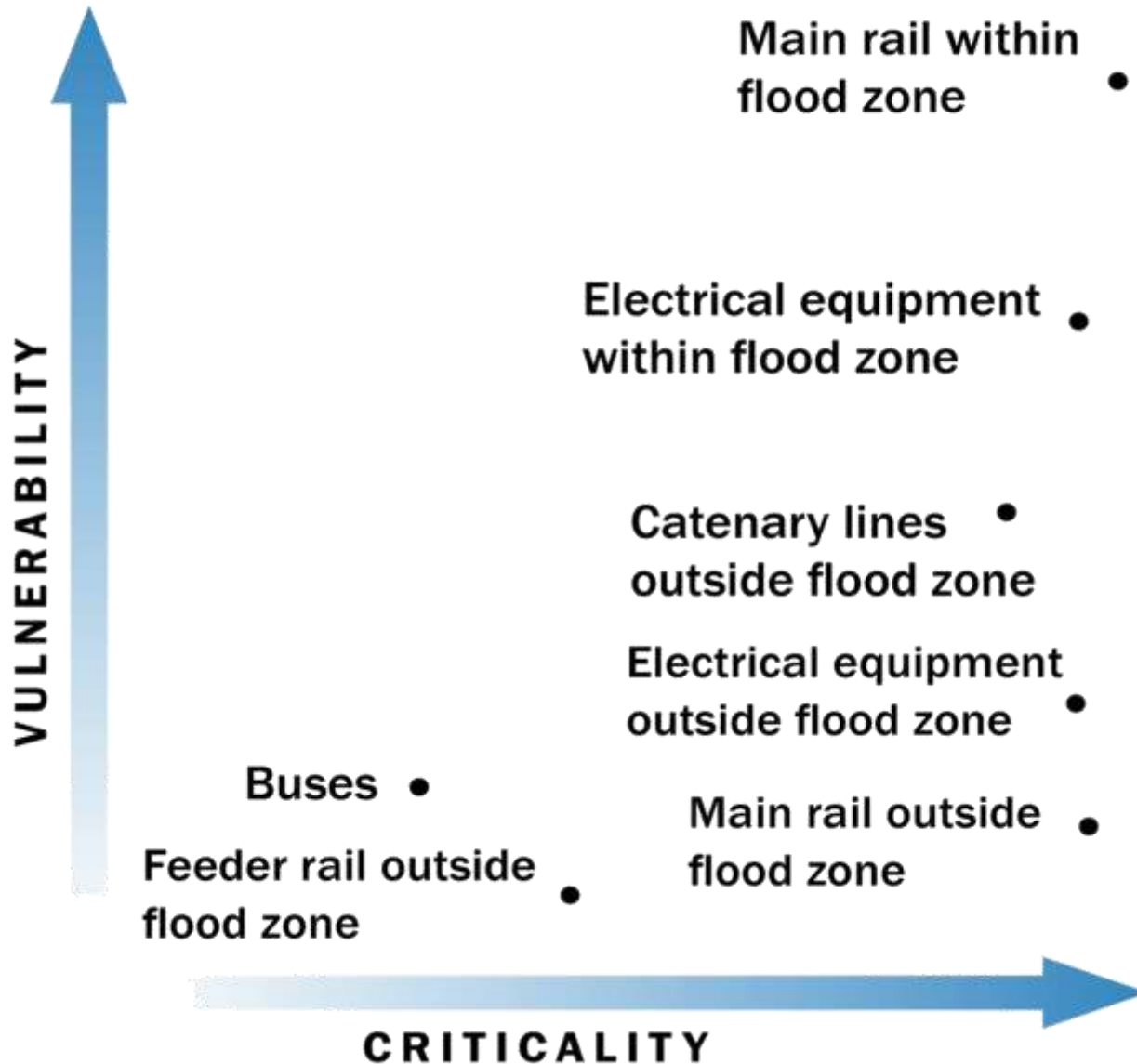
# Risk Assessment for Climate Impacts



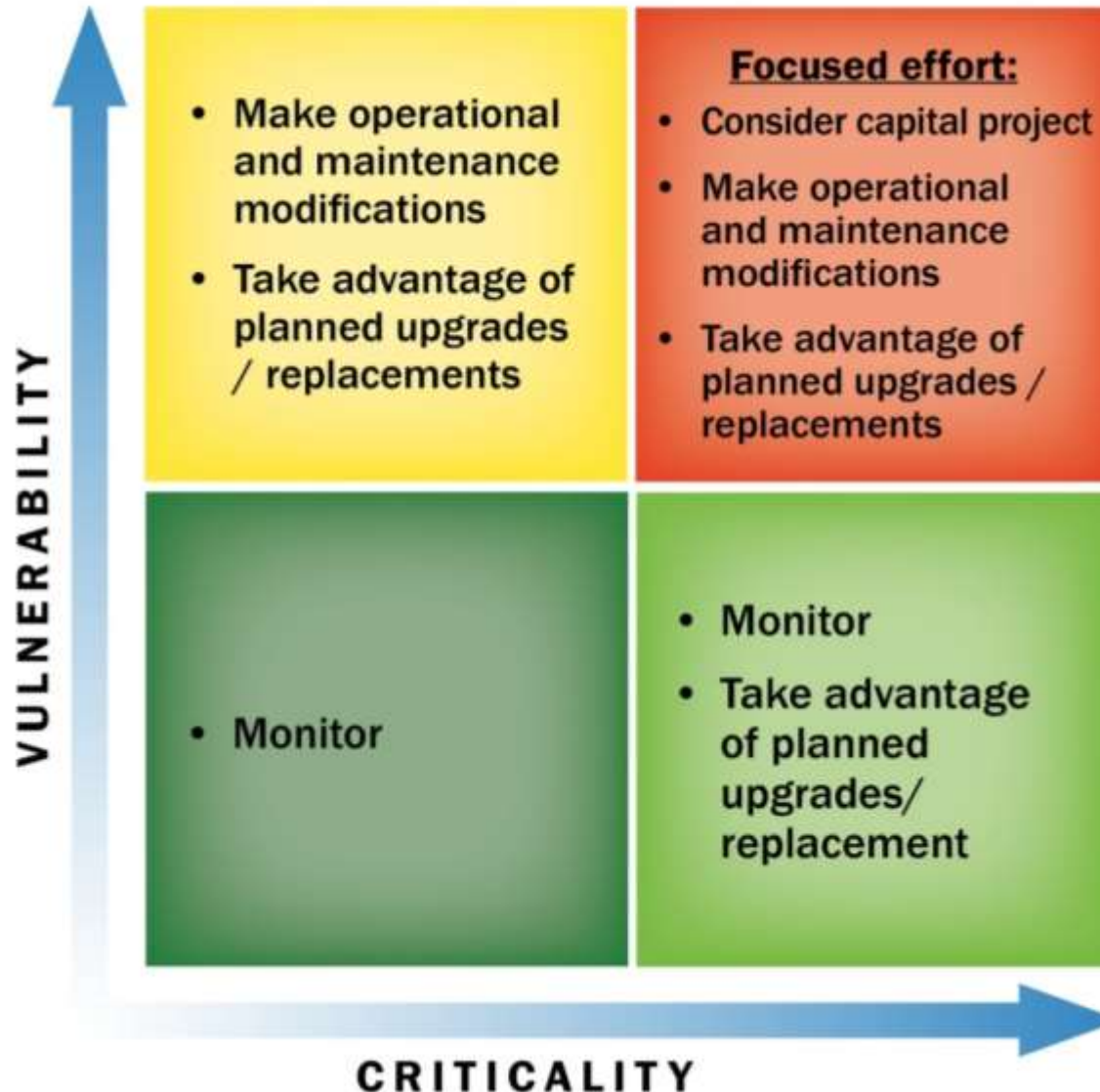
# High Heat Impacts



# Storm Surge Impacts

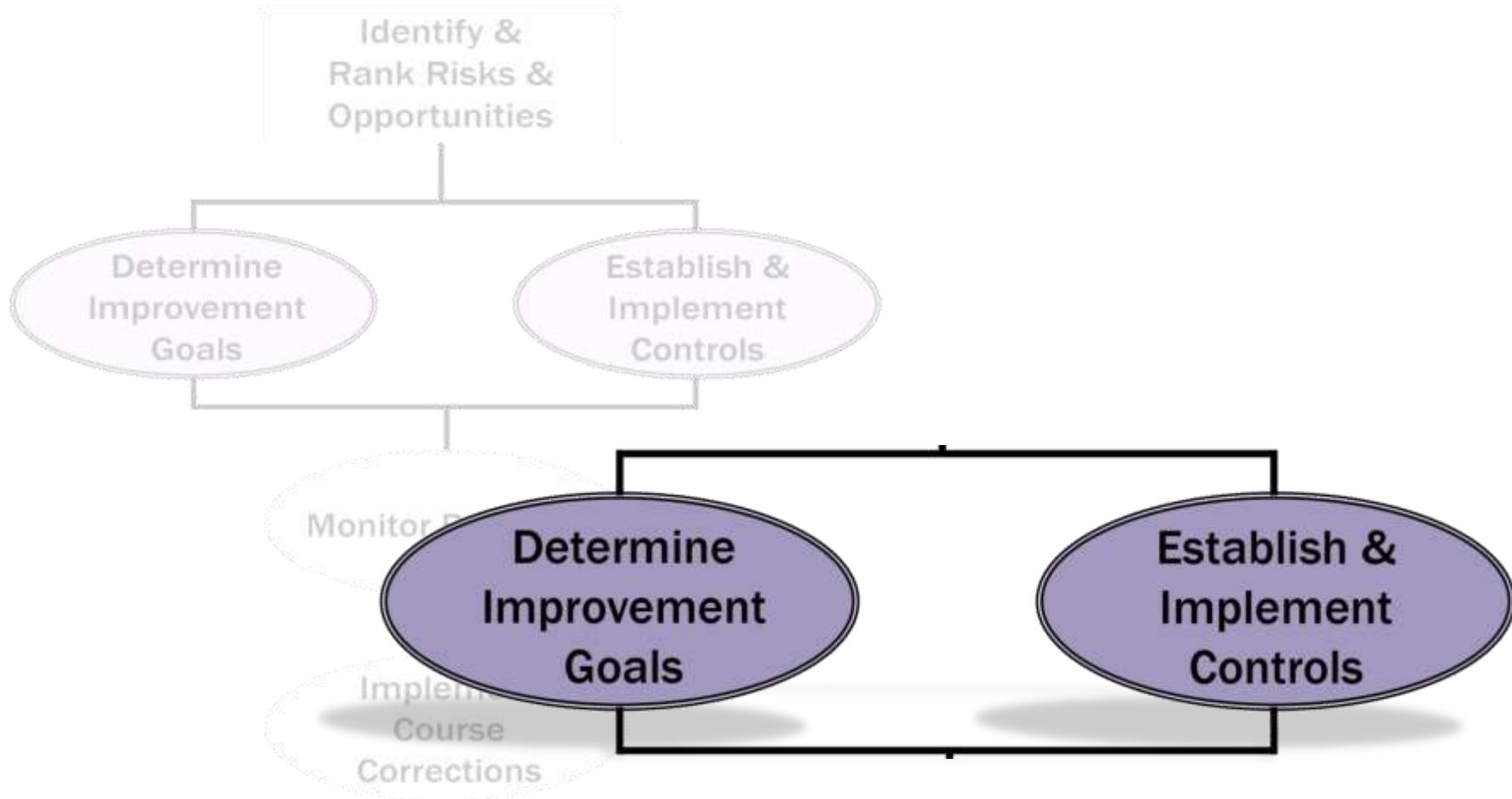


# Management Strategy





# Improve? Maintain?



# Expectations

- What does the organization want to do about these issues
  - Improve them
  - Maintain them
- Involves leadership
  - Consistent with organizational vision
  - Committing appropriate resources including financial

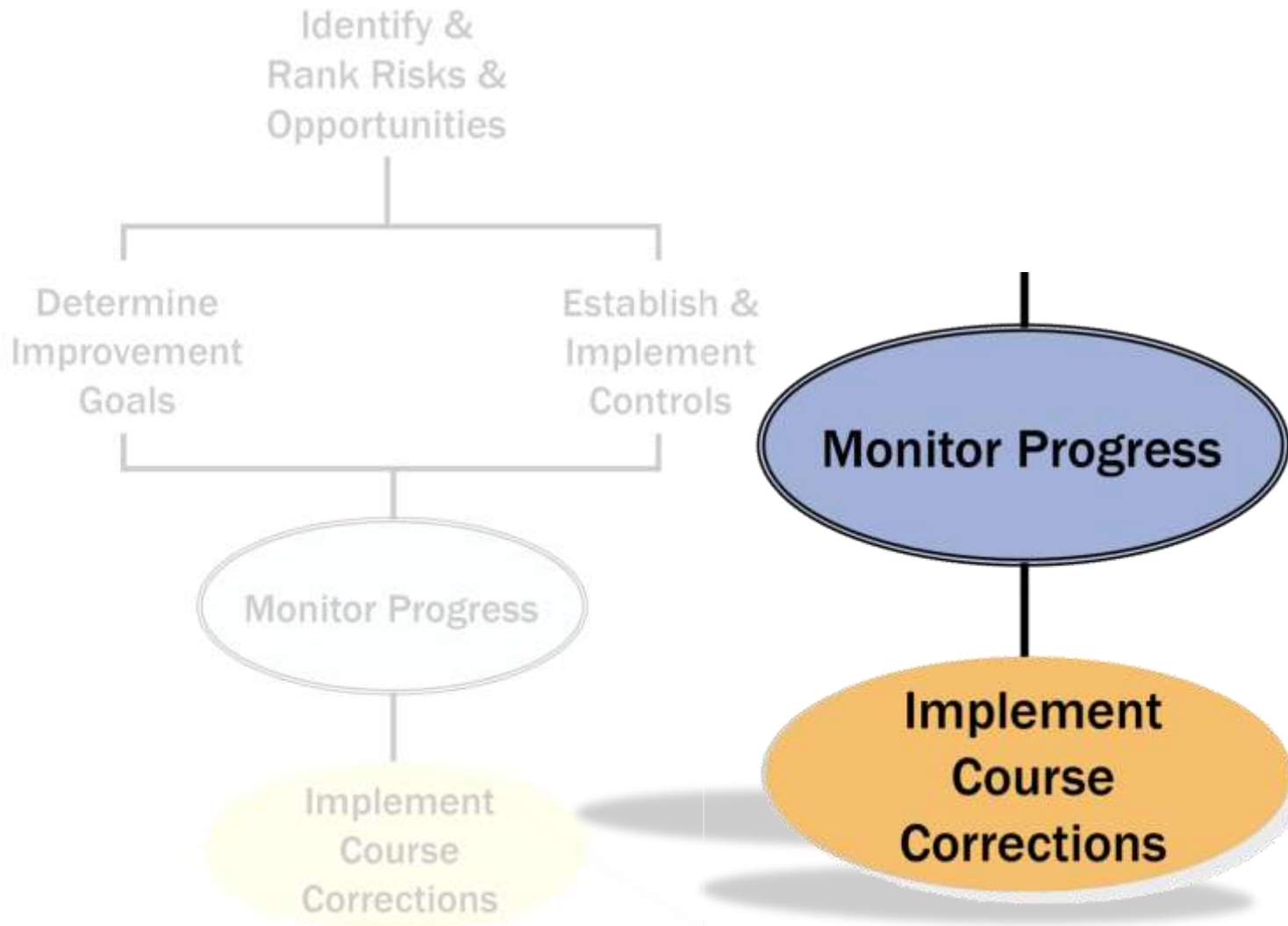
# Use Existing Structure & Processes

- Capital planning
- Design specifications
- Operations and maintenance (SOGR)

# Performance Expectations

- **Improve**
  - Protect critical infrastructure for 100 year flood plus 10%
  - Decrease GHG emissions by 80% by 2050
  - Improve energy efficiency by 2% per year
  - Support transit oriented design
- **Maintain Controls**
  - Maintain current status

# Monitor and Correct



# Tools You May Already Have

**EMS**

- Structure components of similar programs

**GIS**

- Identify geographic locations and fixed assets at risk

**Asset Management & Work Order System**

- Customizable to include climate impact data

**GHG Inventory (sources, sinks, avoided emissions)**

- Identify significant emissions from operations

**Energy Audit**

- Assess significant uses of energy

**Compliance Audit Program**

- Expand to include additional requirements

# Asset Management System Functionality

- Preventive maintenance (routine, ongoing)
- Corrective maintenance (abnormal, emergency)
- Assigns tasks
- Monitors tasks via dashboard
- Generates reports
- Highly customizable



# Asset Management System Expansion

- **Harness functionality by:**
  - Adding and tracking information about assets - criticality, vulnerability to climate change, sustainability, energy use/GHG emissions
  - Distributing requirements to those you need to have complete them
  - Providing input data on observed impacts to planning and SOGR



## DEF Create Work Request

Description of work needed:

Organization:

Location/Equipment:

Facility:

### Work Request Details

### Origination

WO Type:

Status:

Date Reported:

### Comments

Comments:

# GIS Functionality

- Underlying database
- Assets and characteristics are already in database
- Fields for additional asset characteristics can be added relatively easily
- Fields can be set up and opened as separate layers



## Westchester County Airport Environmental Management System

Enter/View Operator  
Records

Determine Impact  
Significance

Edit Pop Down Options

Select Reports

Storm Drain Information

Tank Information

Exit Database

# Operations Information

Operator:

## Vehicles

Operate cars?

Operate busses?

Operate AFV?

Operate other vehicles?

Operate trucks?

Operate fork lifts?

Operate GSE?

Other vehicles operated:

What fuel(s) is used:

Where are they fueled:

## Aircraft

Operate fixed wing?

Operate helicopters?

Operate other aircraft?

Other aircraft operated:

Hours of aircraft operation:

## Equipment

Operate degreasing equipment?

What type of degreasing equipment is operated:

Cleaning agent in degreasing equipment:

How is waste disposed:

Operate hydraulic equipment?

Specific hydraulic equipment operated:

Operate conveyors?

What type of conveyors operate?:

Operate radiation equipment?

What type of radiation operate?:

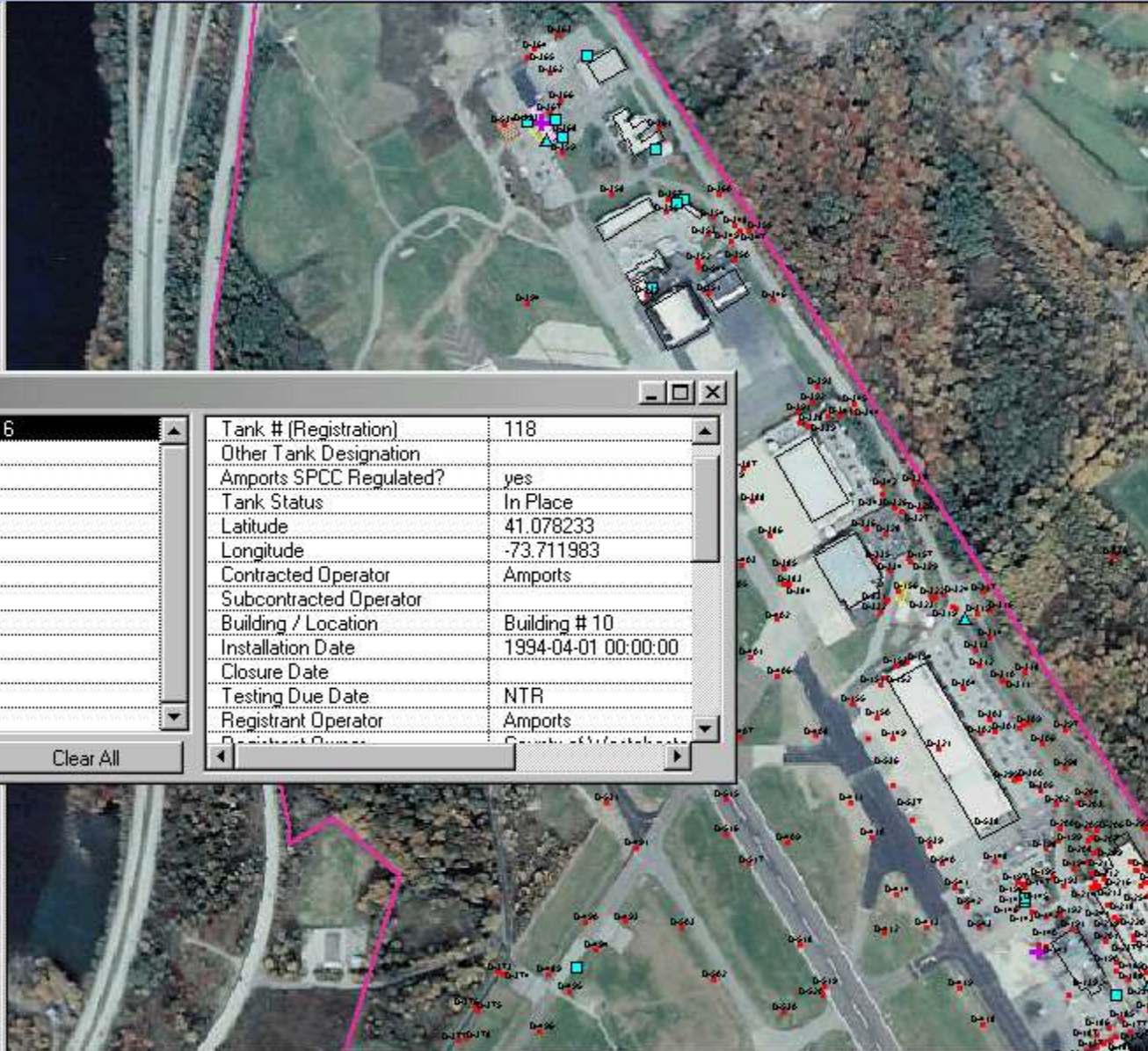
Operate other equipment?

Other equipment operated:

[Return to Operator Environmental Information Form](#)

**SPCC Plan Map**

- Amports Fuel USTs ■
- Amport Fuel ASTs ▲
- Non Amports Fuel USTs ■
- Non Amports Fuel ASTs ▲
- Propane tanks ▲
- Other Storage ▲
- Storm ●
- Airpor +
- Airpor ■
- Airpor ■
- Truck ■
- Fuel T ■
- Deicin ■
- Plane Storage Areas ■
- Fueling Areas ■
- Flow Direction ▲
- Stormwater Divide ■



**Identify Results**

1: Amports Fuel USTs - 16

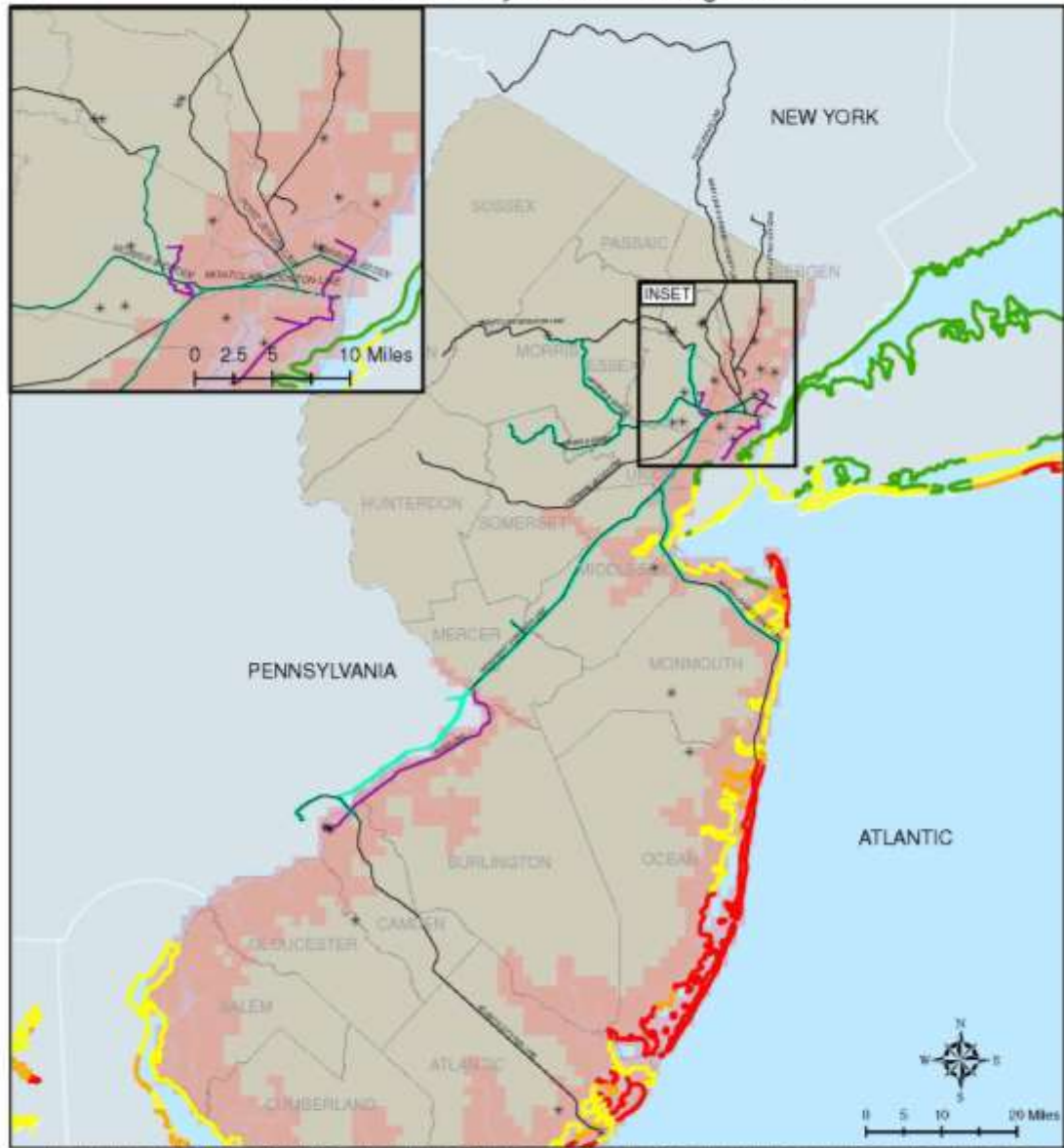
Tank # (Registration)	118
Other Tank Designation	
Amports SPCC Regulated?	yes
Tank Status	In Place
Latitude	41.078233
Longitude	-73.711983
Contracted Operator	Amports
Subcontracted Operator	
Building / Location	Building # 10
Installation Date	1994-04-01 00:00:00
Closure Date	
Testing Due Date	NTR
Registrant Operator	Amports
Registrant Owner	County of Westchester

Clear      Clear All



## New Jersey Transit Rail Lines Coastal Vulnerability and Storm Surge Areas

# New Jersey Transit Rail Lines Coastal vulnerability and storm surge areas



(SOURCE: NICTD/USACE, New Jersey Department of Environmental Protection (NJ DEP), Division of Coastal Management, State Coastal Assessment by the Coastal Risk Assessment Institute for the U.S. Army Corps of Engineers, 2011; New Jersey Department of Transportation, 2011; County of New Jersey, New Jersey Office of Geographic Information Systems, 2010, 2011)

<b>Legend</b>	<ul style="list-style-type: none"> <li><span style="color: red;">■</span> Storm Surge Area*</li> <li><span style="color: green;">■</span> Coastal Vulnerability Index**</li> <li><span style="color: yellow;">■</span> Low</li> <li><span style="color: orange;">■</span> Moderate</li> <li><span style="color: red;">■</span> High</li> <li><span style="color: darkred;">■</span> Very High</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: black;">+</span> Bus Area (Terminals, Stations, etc.)</li> <li><span style="color: black;">—</span> NJT Rail Line</li> <li><span style="color: purple;">—</span> Light Rail Line</li> <li><span style="color: cyan;">—</span> Catering Line</li> <li><span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> NJ County Boundary</li> </ul>	<p>*Storm Surge (Tidebanks) depth natural waterway flow or formerly tide flow at mean high water at the time of mapping.</p> <p>**The Coastal Vulnerability Index furnishes a broad overview of regions where physical changes are likely to occur due to sea level rise based on a combination of variables including geomorphology, regional coastal slope, tide range, wave height, relative sea level rise and shoreline erosion and accretion rates.</p>
---------------	--	--	---

<b>FIRST ENVIRONMENT</b>	MAP 7				
	NEW JERSEY TRANSIT IMPACTS: Coastal Vulnerability Index & Storm Surge Area Map NJ Transit Post 3.06.17				
© 2017 FIRST ENVIRONMENT	DATE	SCALE	STATUS	APP. NO.	REV. NO.



# New Jersey Transit Catenary Rail Lines Forested Areas

## New Jersey Transit Catenary Rail Lines Forested areas



©2011 First Environment, LLC. All rights reserved. This map is a derivative work of the New Jersey Department of Environmental Protection (NJDEP), Office of Strategic Resources Management (OSRM), Bureau of Geographic Information Systems (GIS), 2011, New Jersey Forest Data, 2011, Counties of New Jersey, New Jersey Office of Information Technology (NJ OIT), Office of Geographic Information Systems (OGIS), 2011.

**Legend**

- Forested Area within 50' of Rail Line (Medium to High Density)
- Forested Area within 50' of Rail Line (Low to Medium Density)
- Catenary Rail Line
- No Rail Line
- No County Boundary

<b>FIRST ENVIRONMENT</b>	MAP 6			
	NEW JERSEY TRANSIT IMPACTS - Forested Area Map Rail with Catenary - Forest/Low			
31 Feltz Street Basking Ridge, New Jersey 07005	Design	Draw CME	Checked	Date 6/29/11

# Summary

Use a systematic approach

Leverage what you already have

Recognize you can only do the possible, but the possible is always something

“It is far too late and things are far too bad for pessimism. In times such as these, it is no failure to fall short of realizing all that we might dream - the failure is to fall short of dreaming all that we might realize.”

- Dee Hock  
*Former CEO VISA*

# For More Information

## Contact us:

**Elizabeth Delaney**

**First Environment, Inc.**

**91 Fulton Street, Boonton, NJ 07005**

**973.334.0003**

**[end@firstenvironment.com](mailto:elizabeth.delaney@firstenvironment.com)**

**[www.linkedin.com/in/elizabethdelaney](http://www.linkedin.com/in/elizabethdelaney)**