



# Lean 6-Sigma Program



## DEPARTMENT OF TOXIC SUBSTANCES CONTROL

**Muzhda Ferouz**  
**(Project Greenbelt)**

**Terri Hardy**  
**(Project Champion  
and Executive  
Sponsor)**

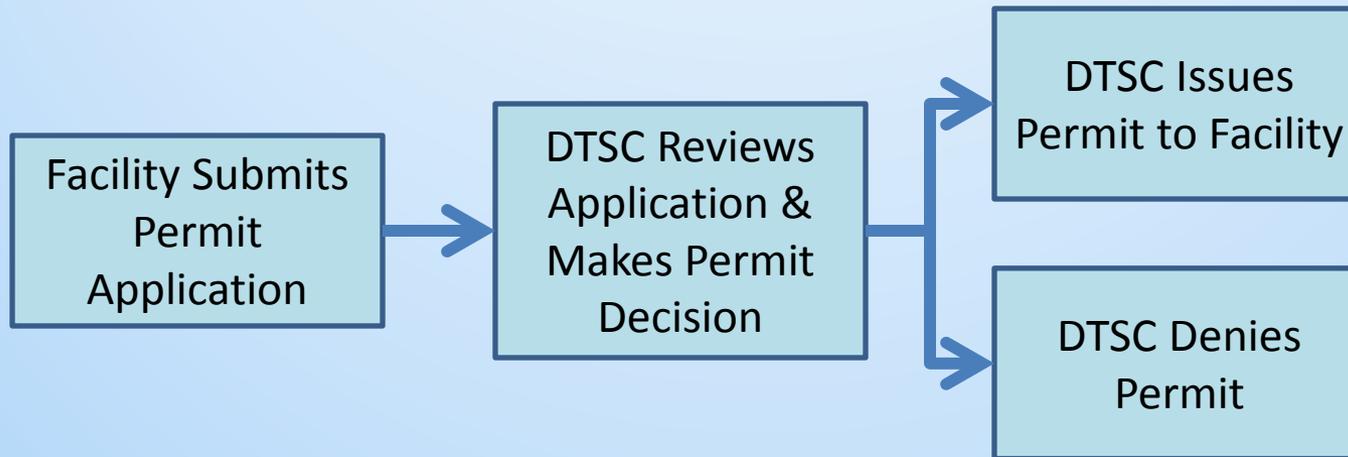


# Mission of DTSC



# Permit Process

Permit process – simplified:



Life is never that simple....Notice of Deficiency (NOD)



# 5 Phase Methodology

- A Lean Six Sigma project uses a five-phase methodology to fix the issues that are hindering our process capabilities:
  1. Define
  2. Measure
  3. Analyze
  4. Improve
  5. Control

# Reduction of Notices of Deficiency (NOD)

- **Problem Statement:** There are many inefficiencies in the Notice of Deficiency (NOD) process; numerous NODs issued to facilities during technical review.
- **Objective:** Reduce the average number of NODs per permit to 50% the present amount
- **Project Team:**
  - *Terri Hardy – Project Champion & Executive Sponsor*
  - *Muzhda Ferouz – Project Greenbelt*
  - *Alfred Wong – Berkeley Office of Permitting*
  - *Amber Harmon – Berkeley Office of Permitting*
  - *Janet Jin – Sacramento Office of Permitting*
  - *Nelline Kowbel – liason between team and Permitting Enhancement Workplan Team*

Define

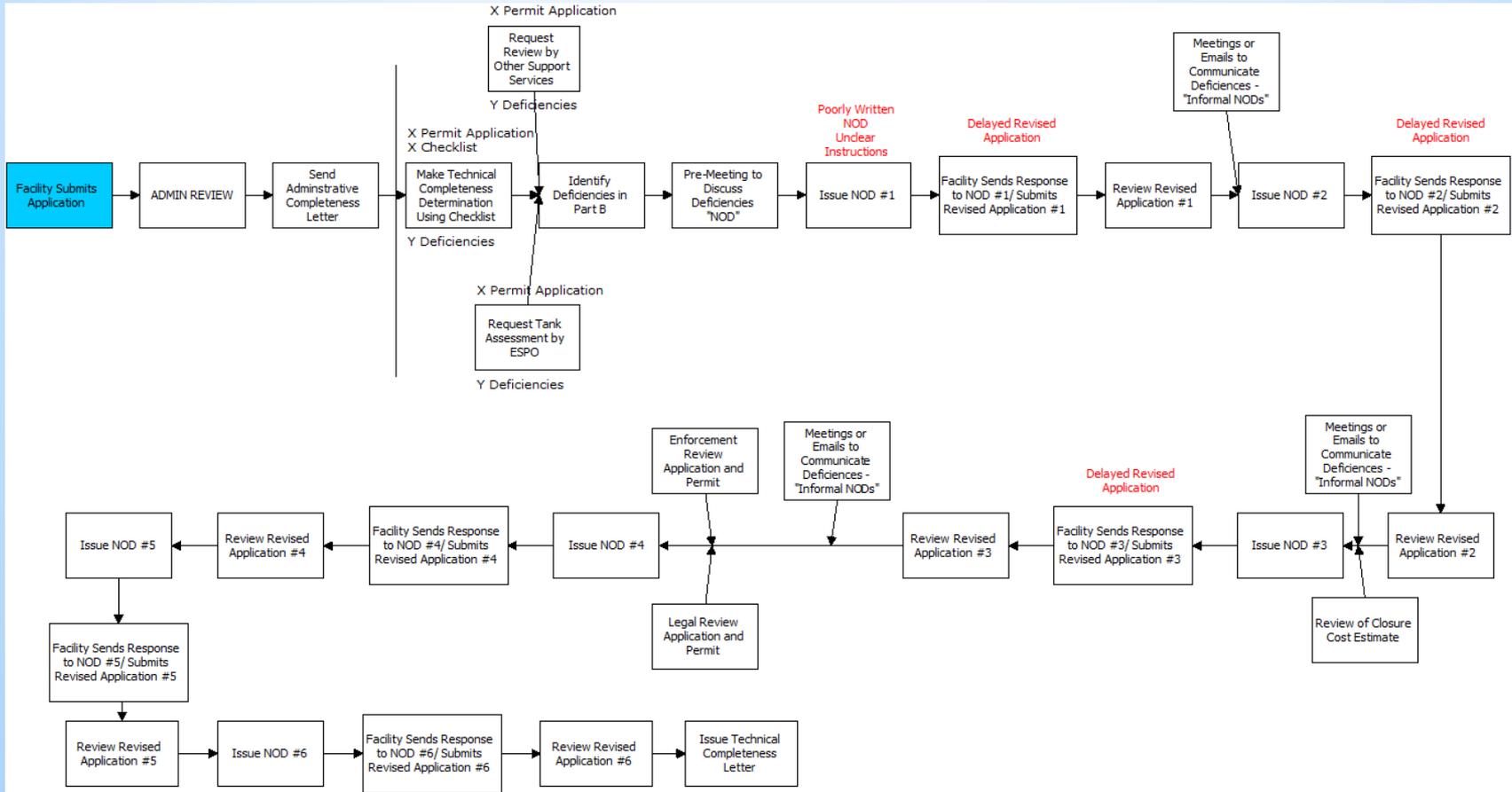
Measure

Analyze

Improve

Control

# Initial Process Map



❖ All steps highlighted in white are non-value added (NVA) steps

Define

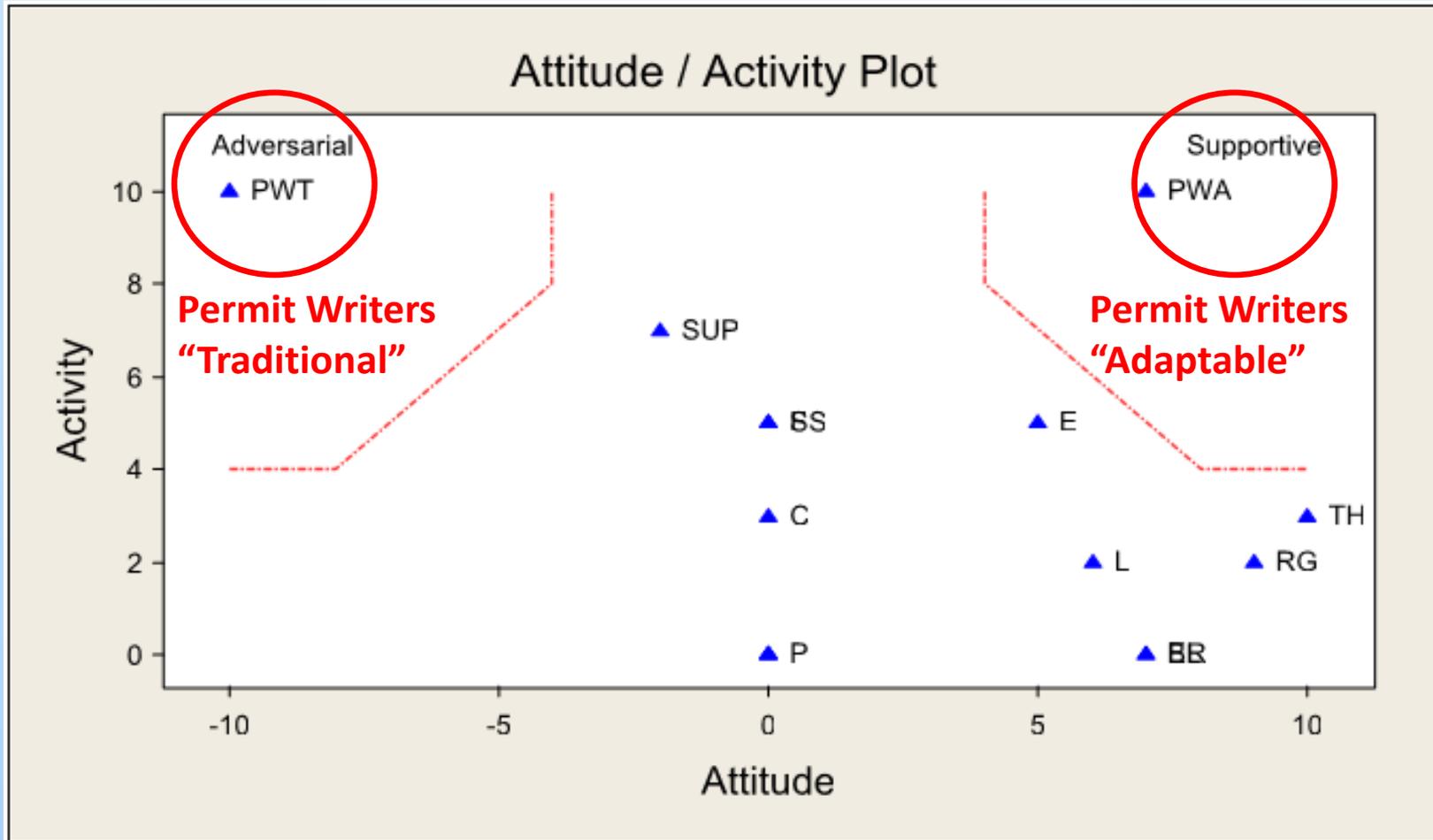
Measure

Analyze

Improve

Control

# Stakeholder Analysis



Define

Measure

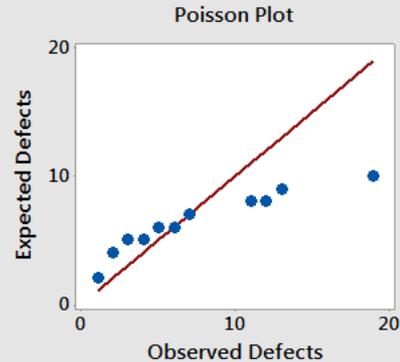
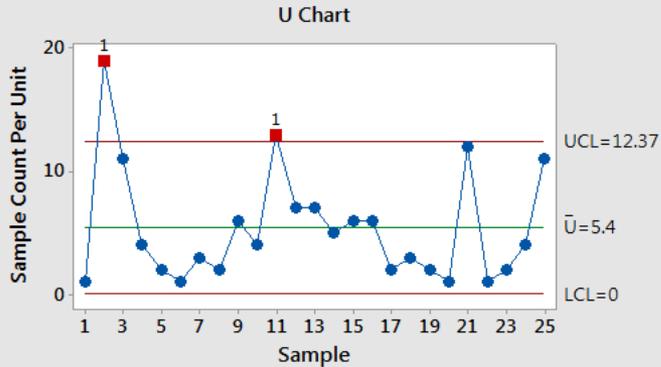
Analyze

Improve

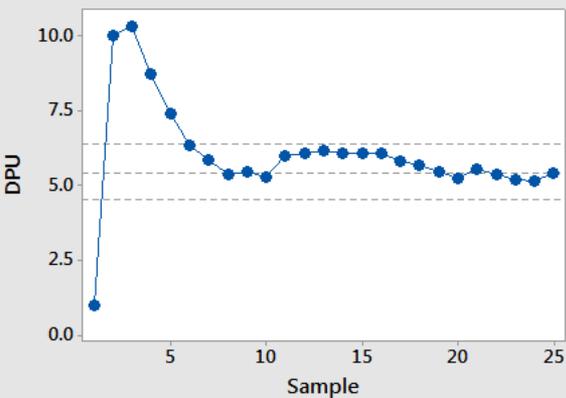
Control

# Baseline Capability

## Poisson Process Capability Report for NODs (Actual)

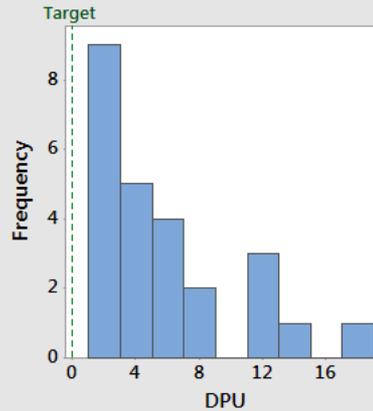


Cumulative DPU



Summary Stats (95.0% confidence)	
Mean Def:	5.4000
Lower CI:	4.5275
Upper CI:	6.3916
Mean DPU:	5.4000
Lower CI:	4.5275
Upper CI:	6.3916
Min DPU:	1.0000
Max DPU:	19.0000
Targ DPU:	0.0000

Histogram



NOD (Actual)	
Formal NOD Letters	Informal Change Requests

Mean Defects: 5.4

Baseline

Define

Measure

Analyze

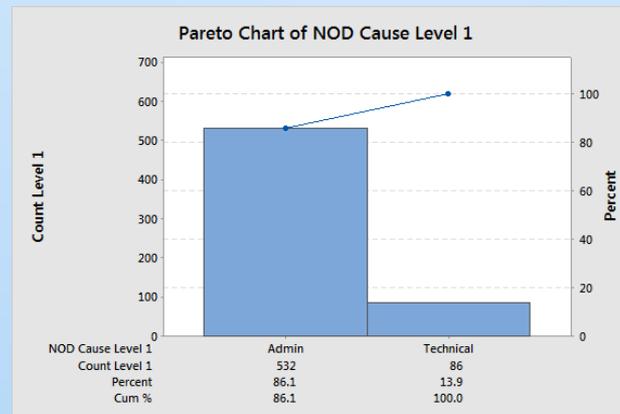
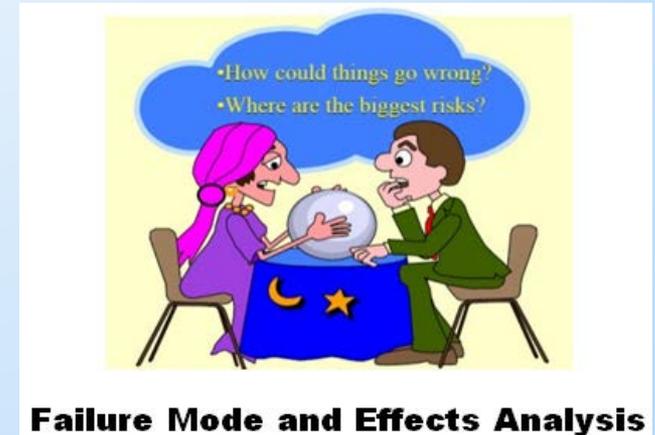
Improve

Control

# Analysis Tools

Analytical tools used to determine critical x's include:

- Process Map
- Fishbone Diagram
- Multi-vari Analysis
- Hypothesis Testing (One Way ANOVA)
- FMEA
- Pareto Charts



Define

Measure

Analyze

Improve

Control

# Key Analytical Finding - FMEA

- Great participation from attendees
- Identified **75** failure modes!
- All 75 failure modes were rated based on severity, likelihood, and detectability
- Top ranking failure modes:
  - Need for early guidance to facilities
  - Lack of standardized training for permitting staff regarding NODs
  - Need for clarity and direction to facility

# NOD Analysis

- NOD letters available from 12 permit projects
- Pareto Analysis in Minitab
- Three levels
  - Level 1: Admin vs Technical
  - Level 2: Missing vs Clarifying vs Others
  - Level 3: Permit Application Sections

Define

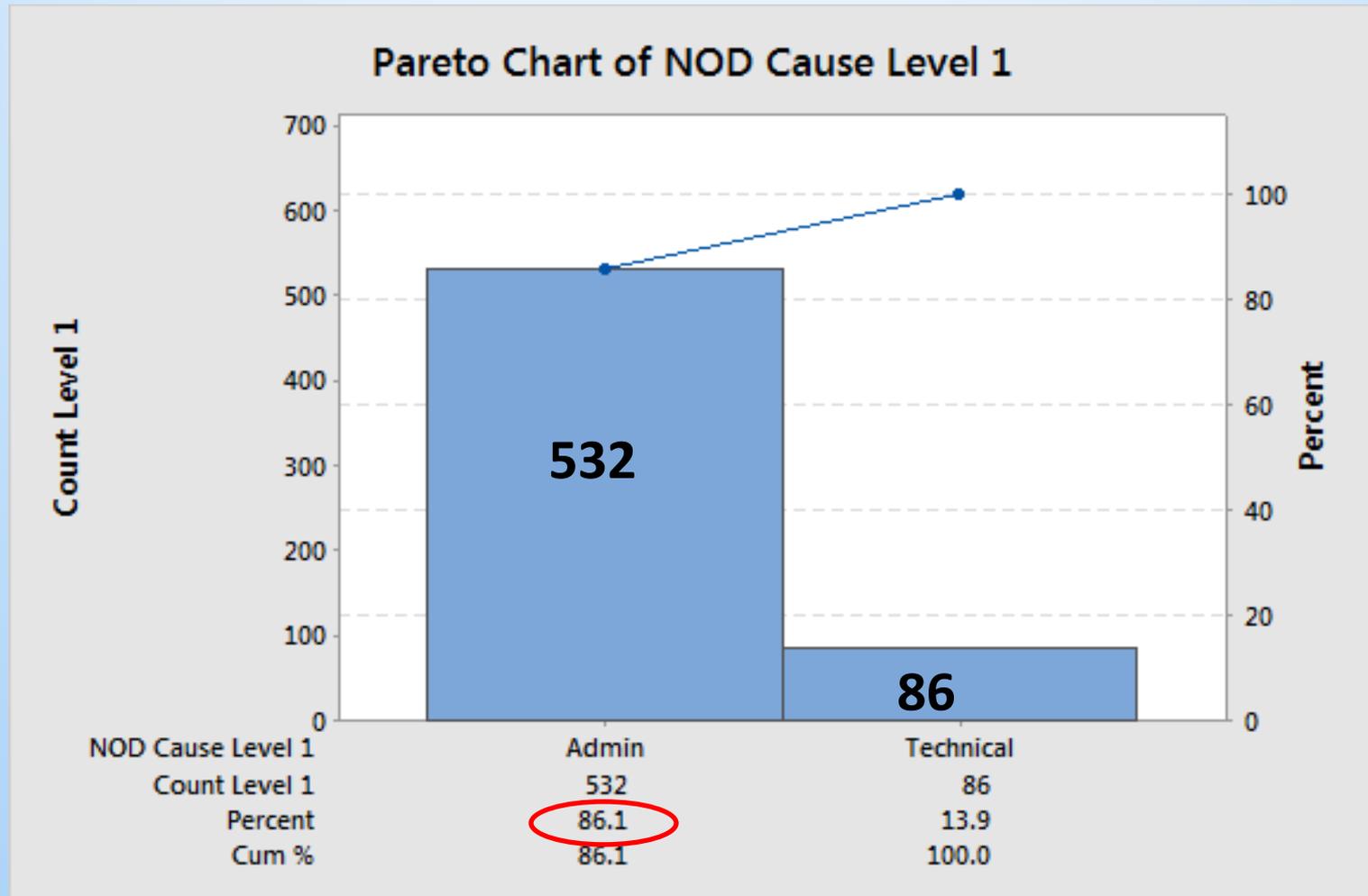
Measure

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Control

# NOD Analysis



Define

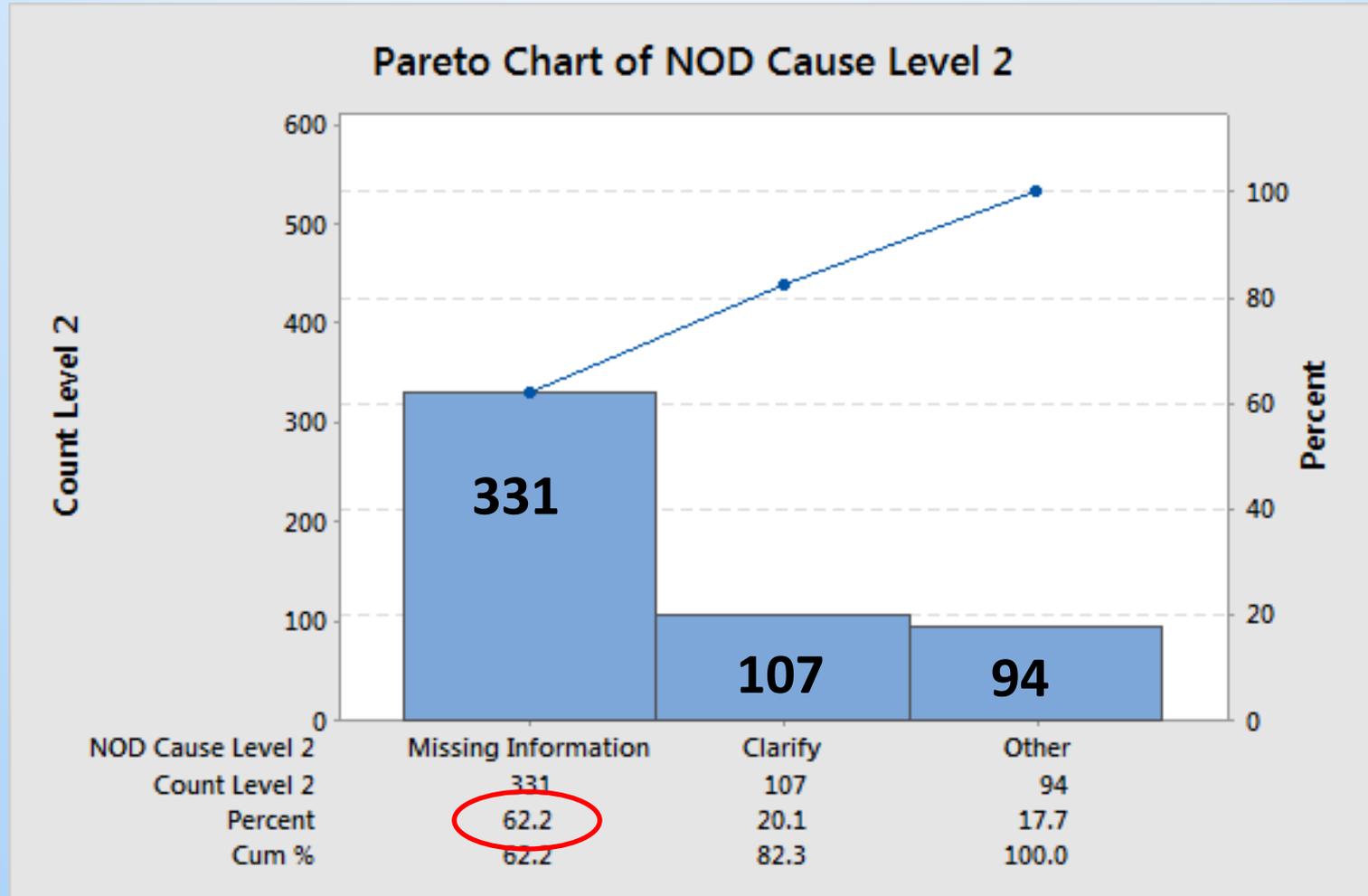
Measure

Analyze

Improve

Control

# NOD Analysis



Define

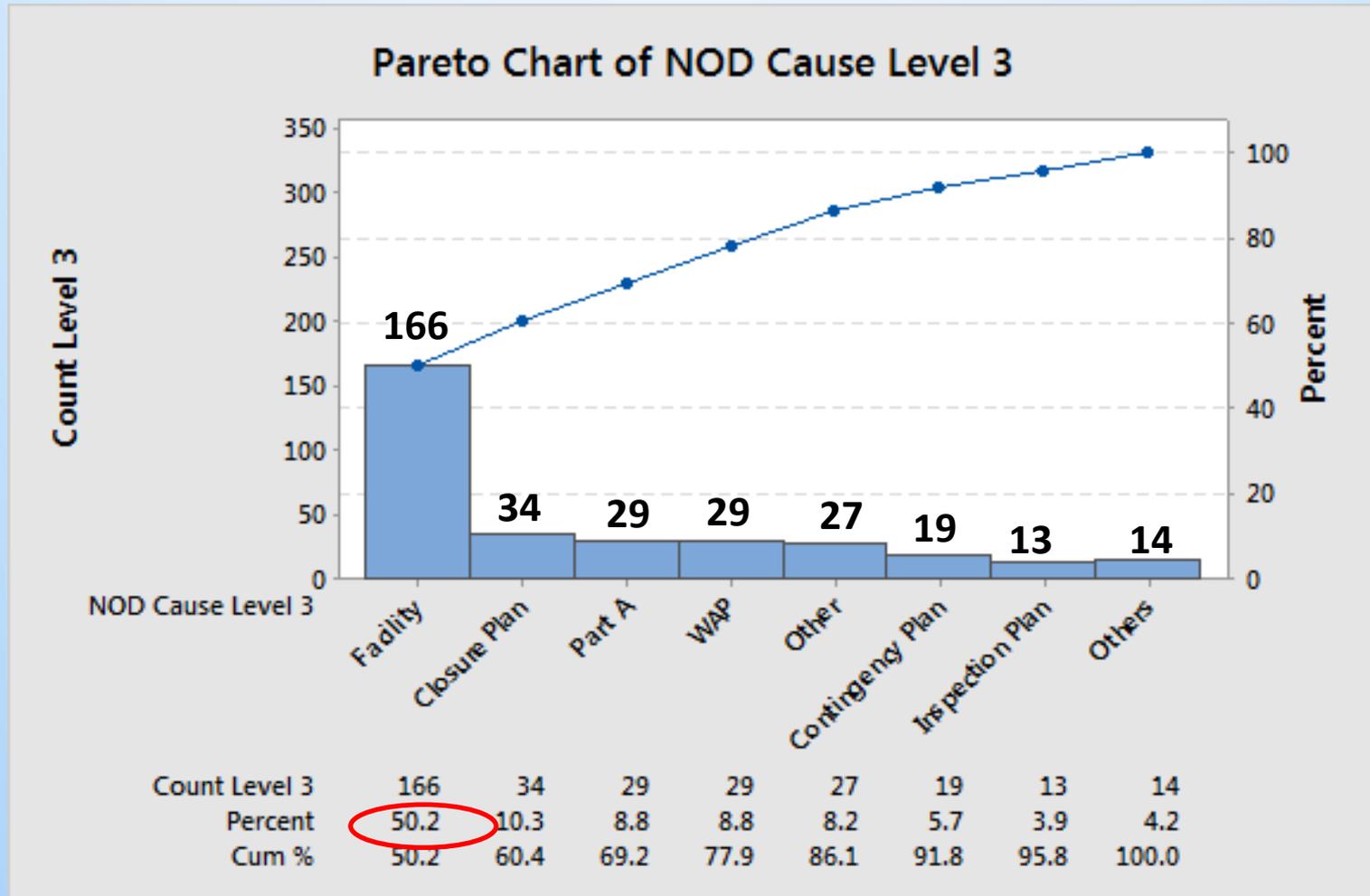
Measure

Analyze

Improve

Control

# NOD Analysis



Define

Measure

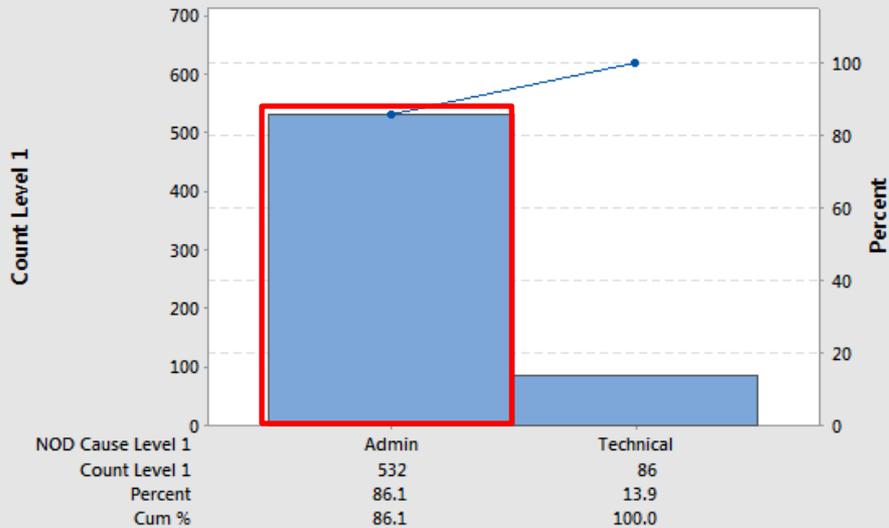
Analyze

Improve

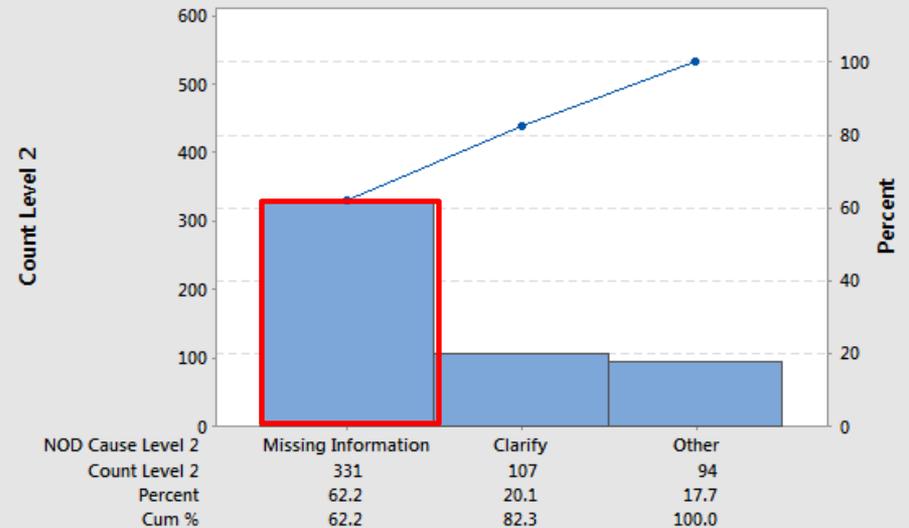
Control

# Key Analytical Finding – Pareto Analysis

Pareto Chart of NOD Cause Level 1



Pareto Chart of NOD Cause Level 2



- If the comments that are “Administrative” in nature and address “Missing Information” are eliminated, there will be a 50% reduction

# Critical X's (root causes of problems)

Root causes determined by FMEA Analysis and Pareto Analysis:

- Lack of early guidance to facilities
- Over half of the deficiencies in the application are “Administrative” in nature and are issues of missing information

# Improvement Techniques

- Pre-application Meeting Agenda and Signature Sheet

 Department of Toxic Substances Control Barbara A. Lee, Director 8800 Cal Center Drive Sacramento, California 95826-3200  Edmund G. Brown Jr. Governor	
<b>HAZARDOUS WASTE MANAGEMENT FACILITY PRE-APPLICATION MEETING AND SITE VISIT</b>	
<ol style="list-style-type: none"><li>1. Purpose of Facility Visit</li><li>2. Applicant's Overview of the Project<ol style="list-style-type: none"><li>a. Confirmation of units in permit application</li><li>b. Proposed changes to operations</li></ol></li></ol>	<ol style="list-style-type: none"><li>8. Fees (CEQA and Application)<ol style="list-style-type: none"><li>a. Lump Sum vs. Reimbursement Agreement</li></ol></li><li>9. Disclosure Statement</li><li>10. Financial Responsibility</li><li>11. Community Concern</li><li>12. Schedule and Time Line</li></ol>
<b>Site Visit Preferred format Permit Completeness Checklist</b>	<p>DTSC and _____ have discussed the items listed above on _____ Facility Name Date</p> <p><b>DTSC Project Manager:</b></p> <p>_____ Signature _____ Print Name</p> <p><b>Facility Representative:</b></p> <p>_____ Signature _____ Print Name</p>
<ol style="list-style-type: none"><li>e. Technical Review/Completeness</li><li>f. Notice of Deficiencies</li><li>g. Draft Permit</li><li>h. CEQA</li><li>i. Public Notice/Public Hearing - 45 day comment period</li><li>j. Response to Comments</li><li>k. Final Permit Decision</li></ol> <ol style="list-style-type: none"><li>7. Correction Action/Phase I Assessment/RFA (RCRA Facility Assessment)</li></ol>	<b>Signature Block</b>
<small>Printed on Recycled Paper</small>	

Define

Measure

Analyze

Improve

Control

# Control Plan

- Control Measures:
  - Upload file to Envirostor

PRE-APPLICATION PHASE - <a href="#">Hide</a>					
	<u>DUE</u>	<u>REVISED</u>	<u>COMPLETED</u>	<u>COMMENT</u>	
→ APPLICANT HOLDS PUBLIC MEETING (0 HR)			01/30/2013	DTSC attended the meeting held on Jan 30 at the Elementary School Cafeteria	<a href="#">UPLOAD DOC</a>
DTSC MEETING SUMMARY (12 HR)			02/18/2013	Meeting Summary was provided by WM	<a href="#">UPLOAD DOC</a>
DTSC MEETING WITH APPLICANT (12 HR)					<a href="#">UPLOAD DOC</a>
	<u>CALL-IN DATE</u>	<u>RECEIVED</u>	<u>CLEARED</u>		
→ DISCLOSURE (0 HR)					<a href="#">UPLOAD DOC</a>
ADMINISTRATIVE PHASE <a href="#">Hide</a>					

- Audit by Unit Supervisor or Branch Chief

Define

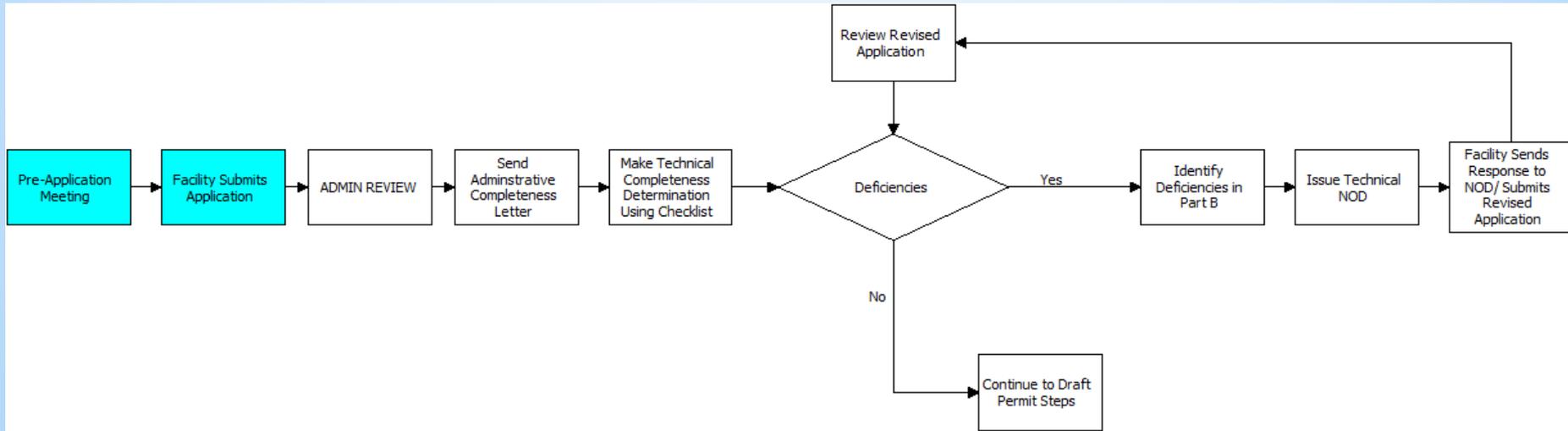
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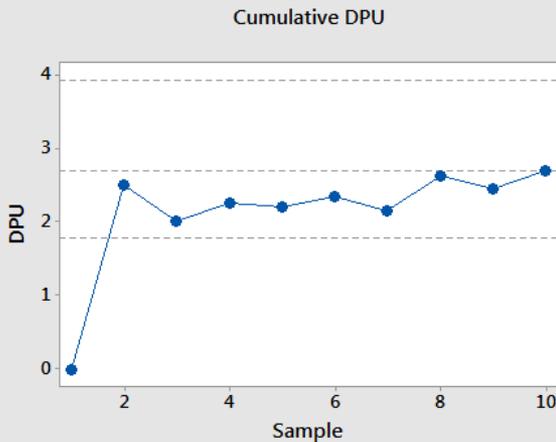
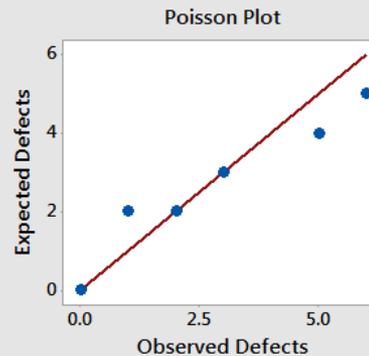
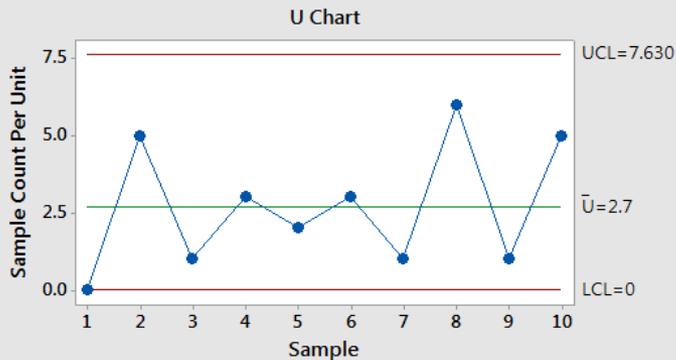
# New Process Map



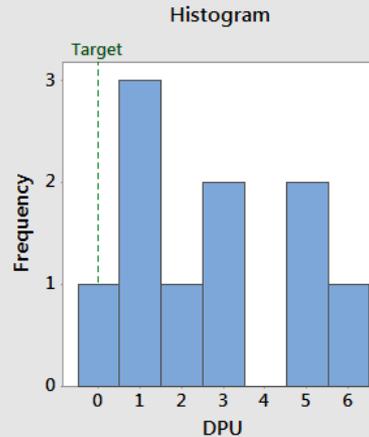
- Added critical step of “Pre-Application Meeting”
- Process is simplified, streamlined, and consistent

# New Capability Analysis

## Poisson Process Capability Report for NODs Post Improvement



Summary Stats (95.0% confidence)	
Mean Def:	2.7000
Lower CI:	1.7793
Upper CI:	3.9284
Mean DPU:	2.7000
Lower CI:	1.7793
Upper CI:	3.9284
Min DPU:	0.0000
Max DPU:	6.0000
Targ DPU:	0.0000



Mean Defects Prior:  
5.4

Mean Defects  
Post Improvement:  
2.7

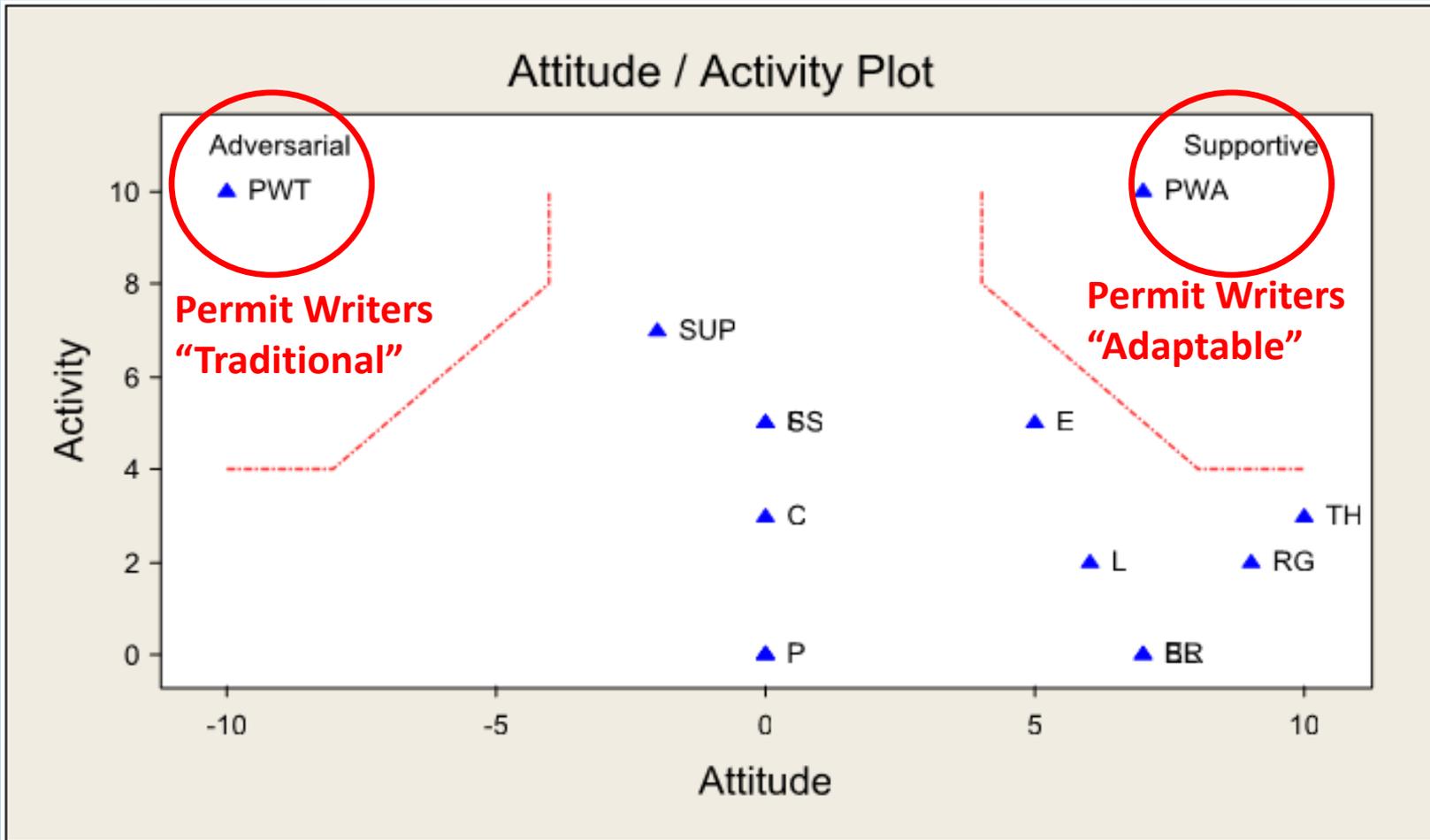


# Project Benefits

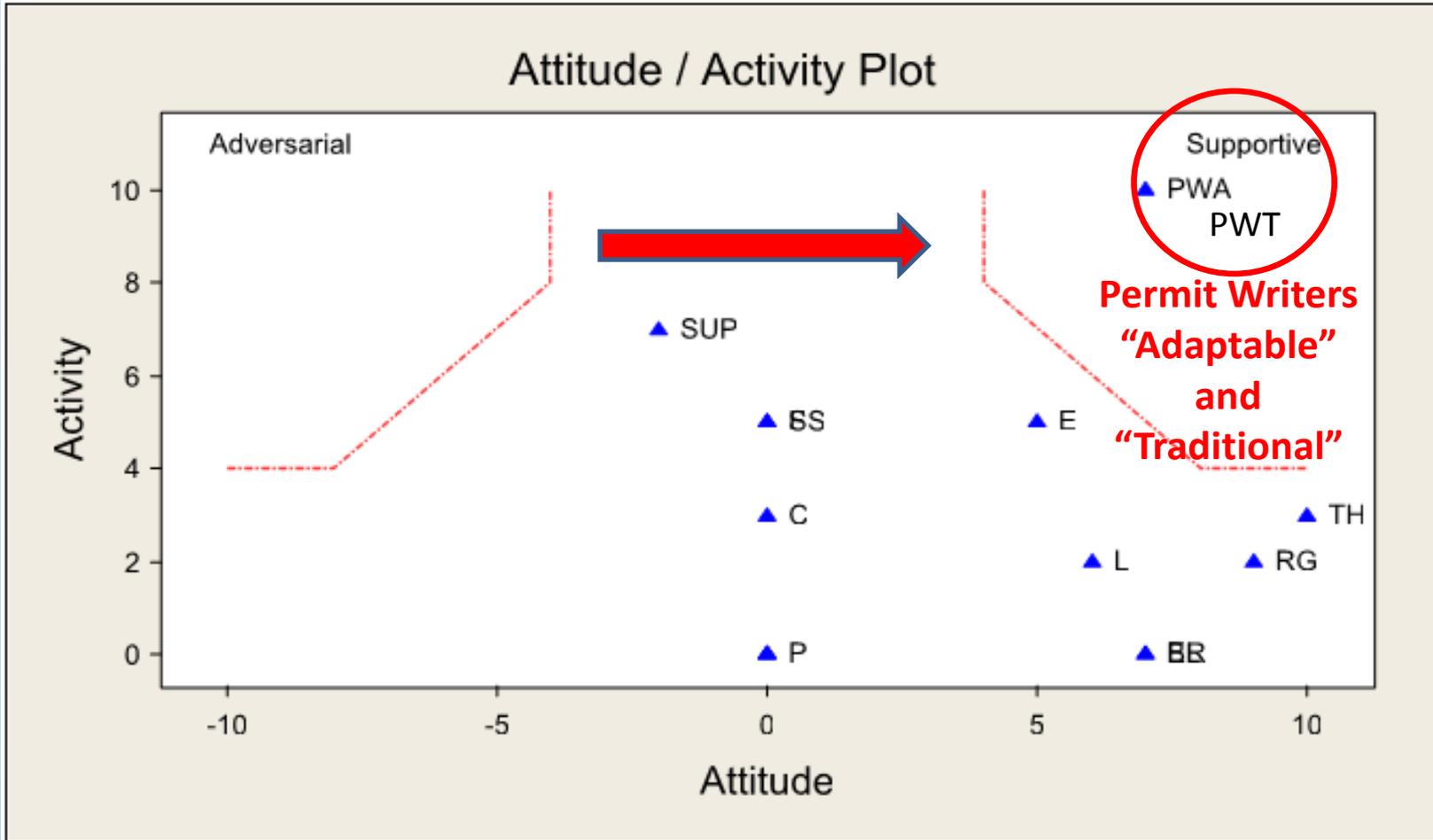
- Early management at its finest
- Consistent process within Permitting
- Force DTSC Project Managers to prepare for initial meeting with facility
- Ensures accountability of facilities
- Reduces technical review time
- Great buy-in



# Project Benefits



# Project Benefits



# Green Belt Contact Information

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# Questions

