



Closed Landfill Issues:

Presented:

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Introduction

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Are We Done Yet?



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Closed Landfills

- Out of Sight & Out of mind?
- ...Nope
- 30-year post-closure responsibility

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Okay, So It's Your Landfill

- At the end of the day, if it's still your landfill ...you'll have to deal with it



Closed Landfills

- What are the issues?
 - *Responsibility & liability*
 - *On-going maintenance and cost*



Forever Responsibility & Liability

- It won't go away ...and you can't leave it behind
- Any options:
 - *Does it belong to someone else?*
 - *Can you sell it to someone else? ...BLM or USFS*
 - *Clean closure*



Post-Closure Cost

- Okay, what's the average cost to maintain a closed landfill?
- Is that with or without NOV or AOC?



Exercise



Why Are We Paying?

- To avoid future problems
- To be responsible
- To maintain the facility
- To stay in compliance

State of California
CIWMB
(Rev 09/08)

California Integrated Waste Management Board
Closed Disposal Site Inspection Report

Page 1

Enforcement Agency: _____

FACILITY FILE NUMBER (99-xx-9999) _____ INSPECTION DATE (MM/DD/YYYY) _____

PROGRAM CODE (Select only one code)
 LEA Periodic CIWMB Closed Sites CIWMB Focused
 LEA Focused CIWMB Enforcement Agent CIWMB Periodic

Time In: _____ Inspection Time _____
 Time Out: _____ Attachments On File (Not Scanned)

Facility Name _____ Received By (Operator) Signature _____
 Facility Location _____ Owner Signature (if present) _____
 Inspector _____ Inspector Signature _____ Also Present (Name) _____

THE ABOVE FACILITY WAS INSPECTED FOR COMPLIANCE WITH APPLICABLE SECTIONS OF DIVISION 30 OF THE PUBLIC RESOURCES CODE (PRC), AND TITLE 14 AND TITLE 27 CALIFORNIA CODE OF REGULATIONS (CCR). THE STANDARDS BELOW ARE CONSIDERED IN COMPLIANCE UNLESS OTHERWISE MARKED WITH ONE OF THE FOLLOWING: V=VIOLATION A=AREA OF CONCERN

POSTCLOSURE	V	A	DRAINAGE AND EROSION CONTROL	V	A
20700 - SITE MAINTENANCE	<input type="radio"/>	<input type="radio"/>	20820 - DRAINAGE/EROSION	<input type="radio"/>	<input type="radio"/>
21180 - POSTCLOSURE MAINTENANCE	<input type="radio"/>	<input type="radio"/>	21190 - DRAINAGE/EROSION CONTROL	<input type="radio"/>	<input type="radio"/>
21190 - POSTCLOSURE LAND USE	<input type="radio"/>	<input type="radio"/>	MONITORING AND CONTROL SYSTEMS		
GAS MONITORING AND CONTROL SYSTEMS			20790 - LEACHATE CONTROL	<input type="radio"/>	<input type="radio"/>
20918 - EXEMPTIONS	<input type="radio"/>	<input type="radio"/>	20830 - LITTER CONTROL	<input type="radio"/>	<input type="radio"/>
20919 - GAS CONTROLS	<input type="radio"/>	<input type="radio"/>	21180 - LF GAS CONTROL/LEACHATE CONTACT	<input type="radio"/>	<input type="radio"/>
20921 - GAS MONITORING AND CONTROLS	<input type="radio"/>	<input type="radio"/>	SECURITY		
20923 - MONITORING	<input type="radio"/>	<input type="radio"/>	20530 - SITE SECURITY	<input type="radio"/>	<input type="radio"/>
20925 - PERIMETER MONITORING NETWORK	<input type="radio"/>	<input type="radio"/>	21135 - SECURITY AT CLOSED SITES	<input type="radio"/>	<input type="radio"/>
20931 - STRUCTURE MONITORING	<input type="radio"/>	<input type="radio"/>	21137 - STRUCTURAL REMOVAL	<input type="radio"/>	<input type="radio"/>
20932 - MONITORED PARAMETERS	<input type="radio"/>	<input type="radio"/>	RECORDS		
20933 - MONITORING FREQUENCY	<input type="radio"/>	<input type="radio"/>	21130 - EMERGENCY RESPONSE PLAN	<input type="radio"/>	<input type="radio"/>
20934 - REPORTING	<input type="radio"/>	<input type="radio"/>	21170 - RECORDING	<input type="radio"/>	<input type="radio"/>
20937 - REPORTING & CONTROL OF EXCESSIVE GAS CONCENTRATIONS	<input type="radio"/>	<input type="radio"/>	21200 - CHANGE OF OWNERSHIP	<input type="radio"/>	<input type="radio"/>
GRADING/FINAL COVER			CLOSURE PLANS		
20950 - GRADING OF FILL SURFACES	<input type="radio"/>	<input type="radio"/>	21890 - CERTIFICATION OF CLOSURE	<input type="radio"/>	<input type="radio"/>
21140 - FINAL COVER	<input type="radio"/>	<input type="radio"/>	21890 - REVISION OF APPROVED PLANS FOR O&M MAINTENANCE	<input type="radio"/>	<input type="radio"/>
21142 - FINAL GRADING	<input type="radio"/>	<input type="radio"/>	OTHER		
21145 - SLOPE STABILITY	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>

Comments: (Note: for additional or continued comments use the CIWMB 03 or attach additional pages.)



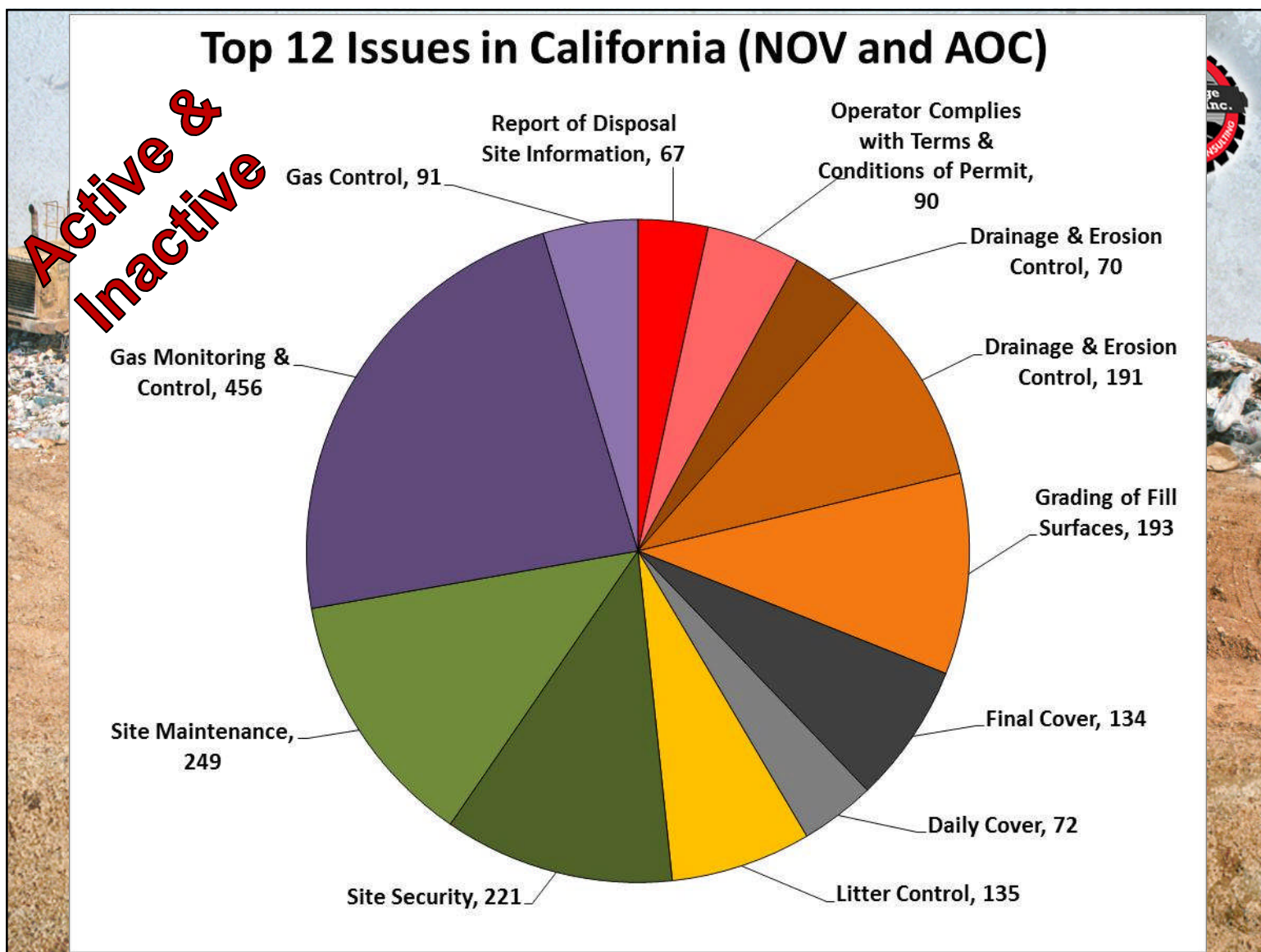
Closed or Active - Similar

- Whether closed or active, landfills have similar problems
- Sure, there are some differences, but things like grading, drainage, litter, site maintenance, gas control, leachate ...very much the same



How Common are Problems?

- There are ~1,500 closed landfills in CA
- And less than 200 active landfills
- Last year ~2,700 NOV or AOC



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Closed Landfills

- We see many of the same issues at closed landfills throughout the State
- Solutions:
 - *Do it right ...one time*
 - Deal with symptom
 - Focus on underlying cause

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Personality Experts Say:

- “As we get older, we really don’t change all that much ...we become more of who we are.”

Marcus Buckingham



Underlying Issue

- Most of the problems at closed landfills can be traced back to operational issues that occurred during the active phase
- What you see *(today)*
...is what you’ll have *(tomorrow)*



Some Examples

- **Settlement**
 - *poor compaction*
- **Leachate Seeps**
 - *excessive cover soil*
- **LFG**
 - *no liner*
 - *poor drainage*
- **Site Security**
 - *poor security during operation*



Symptom or Cause?

Drainage





Symptom or Cause?



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Symptom or Cause?



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Symptom or Cause?



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Symptom or Cause?



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Symptom or Cause?

Site Maintenance



Symptom or Cause?

Site Security





Symptom or Cause?

**Gas
Controls**



Symptom or Cause?

**Perimeter
Monitoring
Network**





Symptom or Cause?

Final Cover



Symptom or Cause?

Leachate Control





Ongoing Maintenance & Cost

- Avoiding the issue won't make it go away
- Best to fix it right and minimize future problems



For Closed Sites:

- Fix problems once – the right way
- Communicate (team) with the regulators
- Goal is to:
 - *Solve current problems*
 - *Limit long-term issues*
 - *Minimize liability*
 - *Reduce cost of Post-Closure Maintenance*



Pre-Closure Activities

- Mitigate those (types of) problems that are common at your closed landfills
- Consider how current issues at your active landfill(s) will affect post-closure
 - *Leachate seeps*
 - *Settlement*
 - *LFG*
 - *Illegal Dumping*



Plan for Closure

- It starts here:





Closure Planning

- Defer costs by stopping 1+ lifts short of final grade
- Modify closure funding schedule based on:
 - *Operational improvements*
 - *Reduced tonnage*
 - *Filling of “forgotten” airspace*



Know the Regulations

- You must be in compliance
- Understand what the inspector looks for
- Do your own inspection
- Work *with* the inspector to improve the site

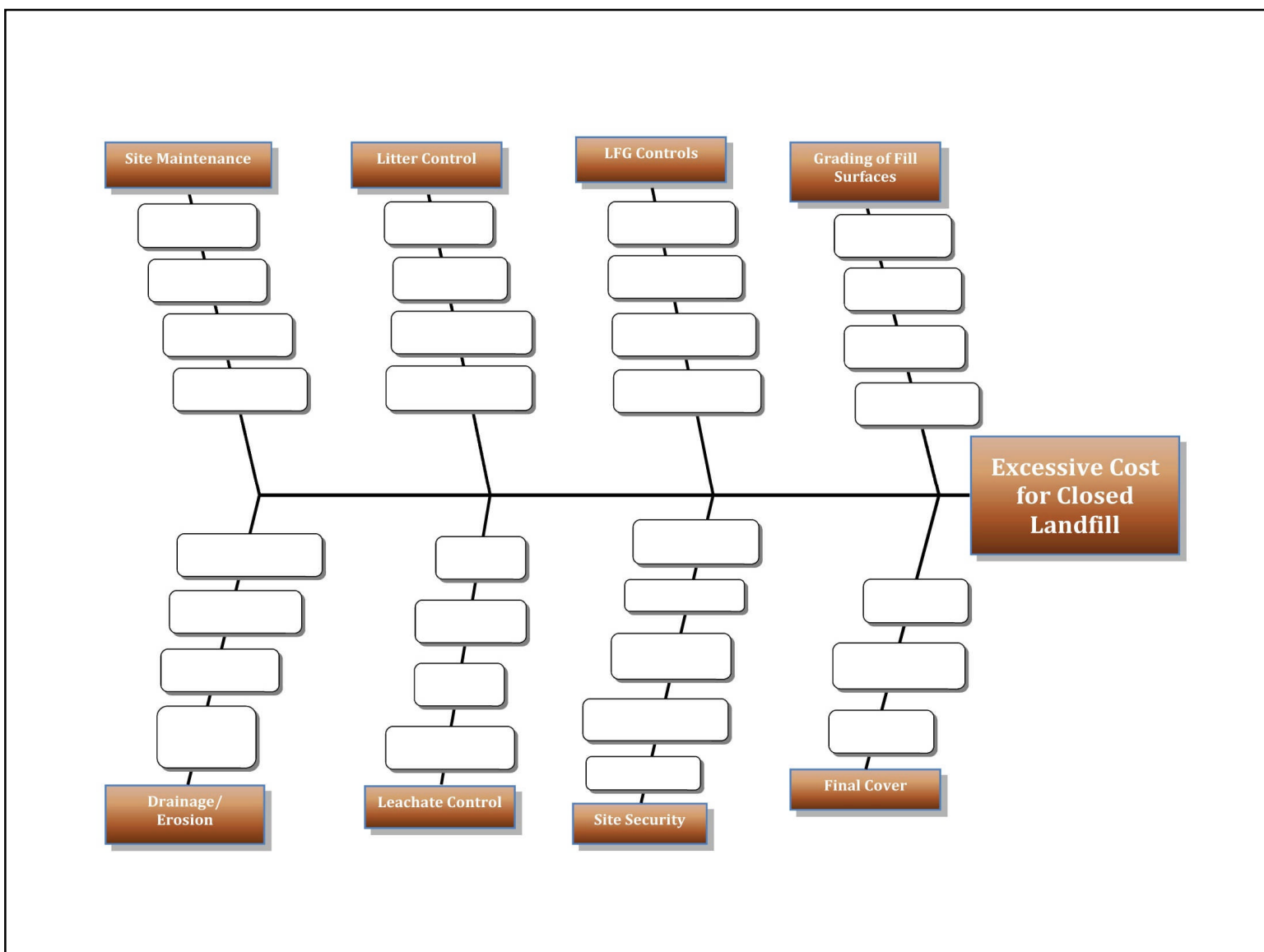


Brainstorm with Team

- Cause & Effect (*Fishbone*) Diagrams
- Some common issues for closed landfills:
 1. Site Maintenance
 2. Litter Control
 3. LFG Controls
 4. Grading of Fill Surfaces
 5. Drainage/Erosion
 6. Leachate Control
 7. Site Security
 8. Final Cover

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Q & A

- Okay, let's talk about some of the ideas from today
- Any questions?



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