

1 Problem

What	Problem(s)	Dam failure, 125 fatalities, 4000 people left homeless	
When	Date	February 26, 1972	
	Time	8:03AM	
Where	Different, unusual, unique	Heavy rains	
	Facility, site	Buffalo Creek Processing Plant	
	Unit, area, equipment	Dam #3	
	Task being performed	Normal operation, water retention from Preparation Plant	
Impact to the Goals			
	Safety	125 fatalities	
	Environmental	Black sludge flowed into Guyandotte River	
	Community Impact	4000 people left homeless	
	Liability	Pittston settled class lawsuit for \$13.4MM	\$13,400,000
	Production-Schedule	?	
	Property, Equip, Mtls	500+ houses destroyed, 943 houses damaged, Dams 1, 2 and 3 destroyed, Highway damage	\$65,000,000
	Labor, Time	Clean-up and recovery efforts, investigation, legal proceedings	\$1,300,000
		This incident	\$79,700,000
	Frequency	1967 Dam #1 failed, 1971 Dam #3 partially failed	

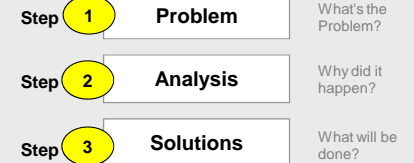
BUFFALO CREEK FLOOD - 1972 CAUSE MAP

125 people were killed and 4000 local residents left homeless when Dam #3 at the Buffalo Creek Coal Preparation Plant in Logan County West Virginia failed and released 137 million gallons of black water into the valley and communities below. The dam was used to contain waste sludge from the coal preparation process. The use of these dams was a historical practice in the coal mining industry because it was less expensive than transporting the waste elsewhere. However, the construction practices for these retention ponds did not follow good engineering practices for earthen dams. The Buffalo Creek Dam #3 was constructed on 40-100 ft of sludge and the construction did not follow specific compaction guidelines to ensure the strength of the dam was adequate. A heavy rain during the 72 hours prior to the failure overstressed the already compromised structure and resulted in the massive destruction and loss of life.

Cause Mapping is a Root Cause Analysis method that captures basic cause-and-effect relationships supported with evidence.

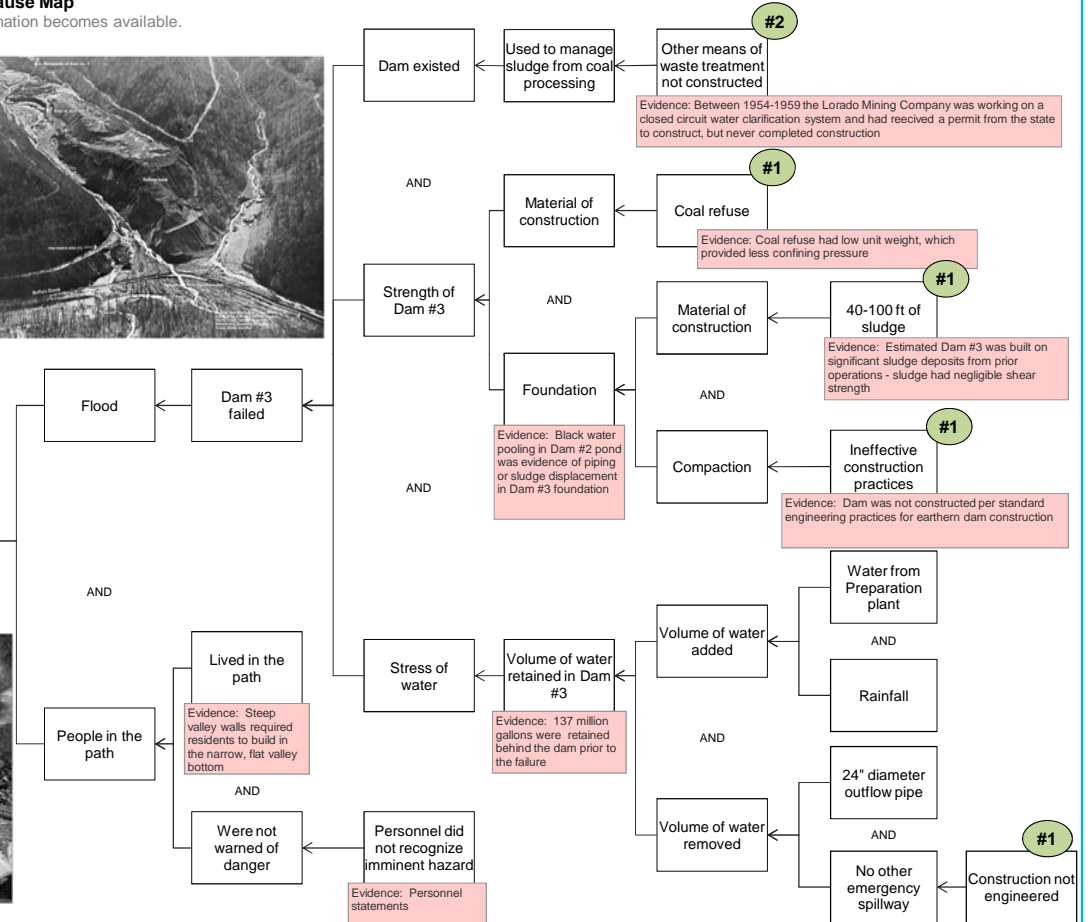
CAUSE MAPPING

Problem Solving • Incident Investigation • Root Cause Analysis



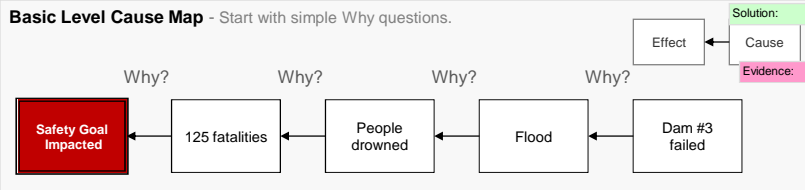
More Detailed Cause Map

Add detail as information becomes available.



2 Analysis

Basic Level Cause Map - Start with simple Why questions.



3 Solutions

Corresponds to an action item in the solution table

No.	Action Item	Cause
1	Dam Control Act 1973 - Construct all earthen dams with solid engineering design and materials	Coal refuse used as material of construction for dam; Foundation built on 40-100 ft of sludge; Ineffective construction practices for compaction of foundation; No emergency spillway engineered
2	Construct alternate means to handle sludge waste from coal preparation plant	Other means of waste treatment not constructed



For a free copy of our Root Cause Analysis Template in Microsoft Excel, used to create this page, visit our web site.

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