

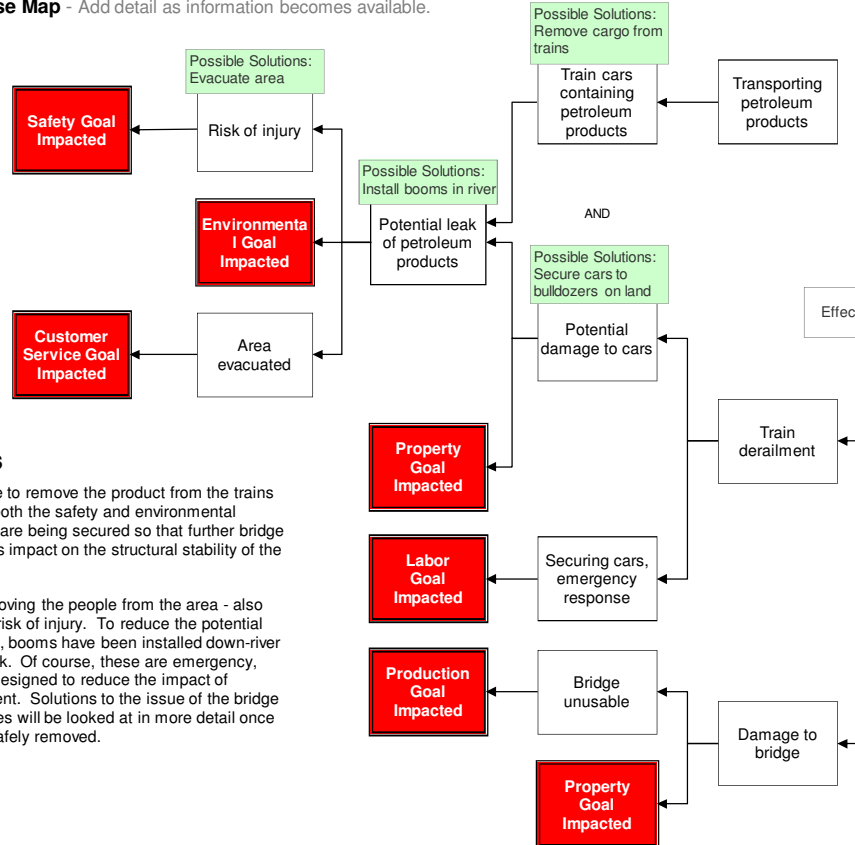
# 1 Problem

What	Problem(s)	Bridge collapse, train derailment
When	Date	June 27, 2013
	Time	3:45 AM
	Different, unusual, unique	Heavy flooding in area
Where	State, city	Over the Bow River, near Ogden, Canada
	Facility, site	Rail bridge; 102-car freight train
	Task being performed	Transporting petroleum products

## Impact to the Goals

Safety	No injuries; risk for injury
Environmental	Potential leak of petroleum products
Customer Service	Area evacuated
Production-Schedule	Bridge unusable
Property, Equip, Mtls	Damage to bridge
	Potential damage to cars
Labor, Time	Securing cars, emergency response

More Detailed Cause Map - Add detail as information becomes available.



# 3 Solutions

Plans are being made to remove the product from the trains to reduce the risk of both the safety and environmental impact. The rail cars are being secured so that further bridge collapse will have less impact on the structural stability of the cars.

The evacuation - removing the people from the area - also serves to reduce the risk of injury. To reduce the potential environmental impact, booms have been installed down-river in case of product leak. Of course, these are emergency, short-term solutions designed to reduce the impact of collapse and derailment. Solutions to the issue of the bridge collapse and its causes will be looked at in more detail once the cars have been safely removed.

# TRAIN DERAILMENT

## Risk to community mitigated during heavy flooding

In the very early morning of June 27, a rail bridge over the Bow River collapsed, just as the end of a long train went across. The last six cars - five of which contained petroleum products, the last empty - derailed and are now precariously balanced on the collapsed bridge.

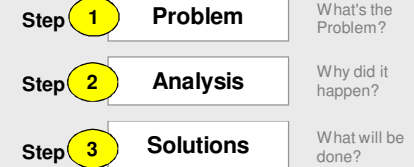
"Each car could have about 80,000 pounds of product in that car and they're all flammable liquids, so if something goes wrong, we could have a very big pile of burning material."  
- Ken Uzeloc, Acting Calgary fire chief

Cause Map

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



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

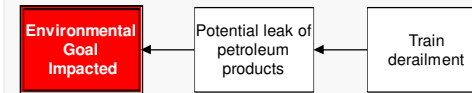
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# 2 Analysis

Basic Level Cause Map - Start with simple Why questions.



## Basic Cause-and-Effect

The derailment of a train carrying petroleum products has the potential to result in a spill, impacting the environmental goal.

