



U.S. Chemical Safety and
Hazard Investigation Board



West Fertilizer Company Explosion West, TX April 17, 2013

Dr. Rafael Moure-Eraso, Chairperson
U.S. Chemical Safety Board

National Fertilizer Industry Round Table Conference
Tampa FL
November 21, 2013



Agenda

- **CSB at a glance**
- **Incident re-cap**
- **Investigation activities to date**
- **Key Issues**



U.S. Chemical Safety Board

- Independent federal agency
- Investigates major chemical accidents
- Finds *root causes* of accidents
- Conducts safety studies
- Issues recommendations to stakeholders



U.S. Chemical Safety Board

- **Regulatory Agencies (OSHA, EPA)**
- **Non-Governmental Organizations (NFPA, API, ASME)**
- **Companies & Industrial Sectors**
- **Legislative Bodies (States, Local)**
- **Disseminates findings-Reports and Videos**



Incident Re-cap

- Occurred on April 17, 2013
- West Fertilizer Co. West, TX
- Intense fire
- Explosion
- 14 fatalities
 - Significant ER casualties
 - Off site casualties
- Extensive damage



Property damage is estimated to be in excess of \$100 million

- **150 buildings offsite destroyed**
- **77 homes were designated as unsafe and uninhabitable**
- **90 more residences were limited to restricted use only until repairs could be completed**
- **22 unit apartment complex, located about 450 feet west of the fertilizer plant was totally destroyed**

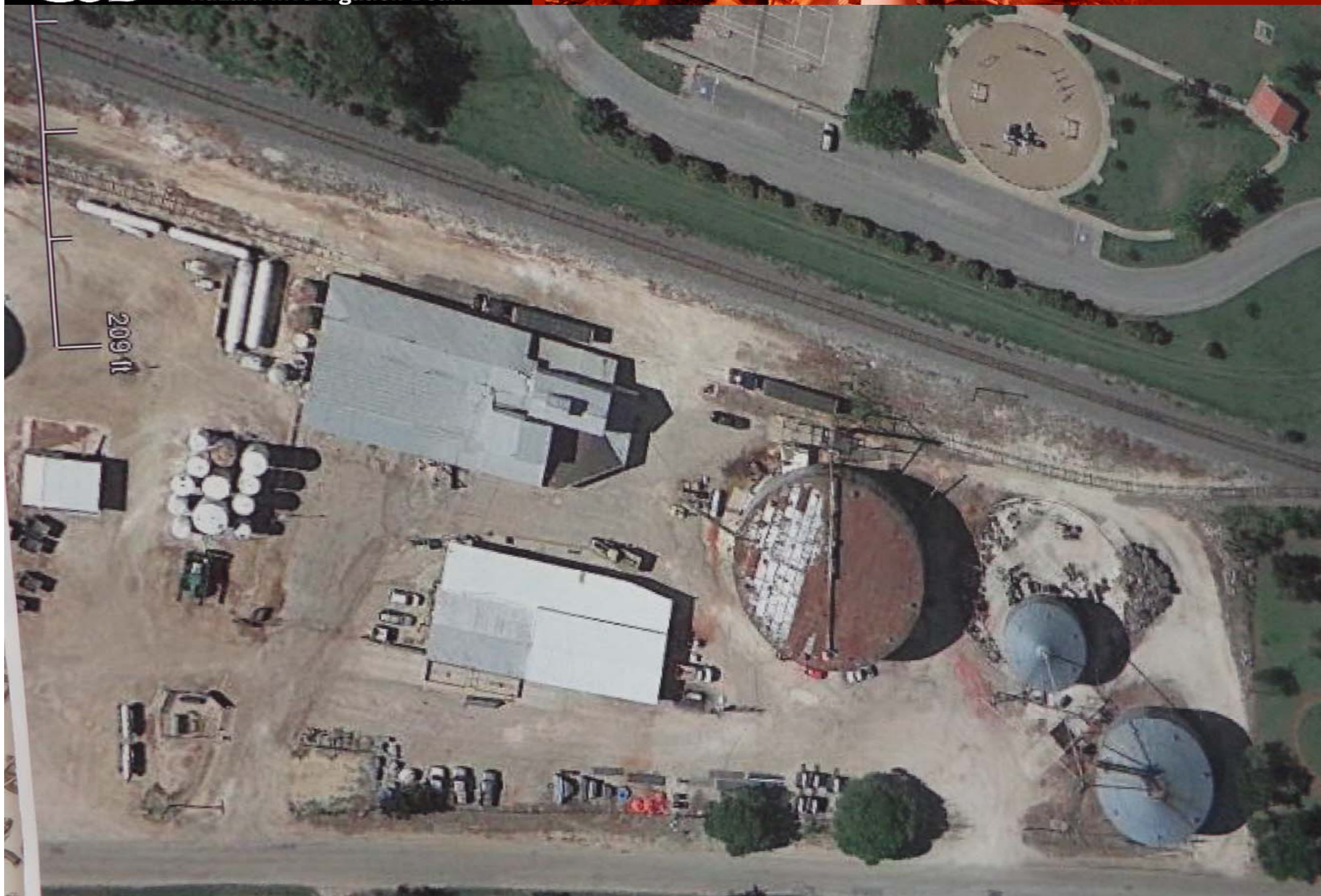


Property damage is estimated to be in excess of \$100 million

- **A 145-bed nursing home located 0.10 mile west of the facility was destroyed**
- **Middle school located about 0.15 miles southwest of the facility was damaged beyond repair and razed.**
- **Two of three neighboring schools sustained heavy damage and are undergoing extensive repair work**
- **One hospital was heavily damaged**



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Fertilizer Building Before Explosion

Crater Location

West TX





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Historic Ammonium Nitrate Incidents (partial list)

Incident	Location	Date	Consequences
BASF Explosion	Oppau, Germany	Sept 1921	500-600 fatalities 2,000 injuries Widespread community damage
Port of Texas City Explosion	Texas City, Texas	April 1947	581 fatalities 5000 injured Triggered subsequent explosions of nearby ships and storage facilities
Terra Industries Explosion	Port Neal, Iowa	Dec 1994	4 fatalities 18 injuries 5700- tons anhydrous ammonia released
AZF Factory Explosion	Toulouse, France	Sept 2001	31 fatalities 2500 injuries Widespread community damage
Saint Roman Barn Explosion	St-Romain-en- Jarez, France	Oct 2003	26 injuries Widespread community damage
El Dorado Chemical Co. Fire	Bryan, Texas	Jul 2009	Facility damage 80,000 college students evacuated
West Fertilizer Co. Fire and Explosion	West, Texas	Apr 2013	14 fatalities 260 injuries Widespread community damage



AN Fertilizer Storage Locations US and Texas

Where	Number of Locations	Estimated Storage in each Location (lb)	Observations
US Nationwide	800	>10,000	50 States Tier2 CSB Estimated
Texas	83	>10,000	E-Plan Hazmat Response System Database, UT Dallas, TX



Key Investigation Issues

- **Emergency Responder & Civilian Casualties**
- **Siting, zoning, land use planning**
- **Role of AN in incident**
- **Absence of Regulatory Oversight**
- **Offsite damage**



Why Such Severe Consequences?

- **Plant Location in proximity to neighbors**
 - Apartment, nursing home, schools, houses
- **Inappropriate Construction Materials**
 - Wood bins, wooden structure
 - Asphalt shingles
 - PVC pipe
- **Materials involved in detonation**
 - ammonium nitrate, organic contaminants



Next Steps

- **Develop blast models of incident**
- **Analyze collected data**
(interviews, building materials, AN, contaminants, written records)
- **Stakeholders meeting to identify expectations**
- **Participate in Presidential EO activities**
- **Develop full report**
- **Present findings at final public meeting**



CSB Potential Recipients of Recommendations

- **State of Texas**
 - Urgent need to establish a system to set up and develop enforceable Fire Codes for buildings in municipalities with less than 250,000 inhabitants
 - Local Fire Departments to enforce fire codes
- **Nationwide and Texas**
 - Zoning Rules to have appropriate distances of inhabited spaces from potentially explosive sites



CSB Potential Recipients of Recommendations

- **EPA**
 - **Revise 40 CFR 68 to include self-reactive chemicals, including ammonium nitrate, on the list**
- **OSHA**
 - **Revise the OSHA Standard (29 CFR 1910.109) to prohibit the use of combustible materials of construction (and buildings) , including impregnated wood, for AN storage bins .**



CSB Potential Recipients of Recommendations

- **National Fire Protection Association (NFPA)**
 - **Revise NFPA 400, *Hazardous Materials Code*, to include siting requirements that prohibit the storage of bulk ammonium nitrate near occupied structures**
- **National Volunteer Fire Fighter Council (NVFC)**
 - **Develop training modules and implement a programmed advisory on fire fighting (allow to burn)**



QUESTIONS ?