EPA
United States
Environmental Protection
Agency

EPA's Approach to S&T Technical Support During Disasters

Gregory Sayles, Ph.D.
U.S. EPA Office of Research and Development
Acting Director, National Homeland Security Research Center

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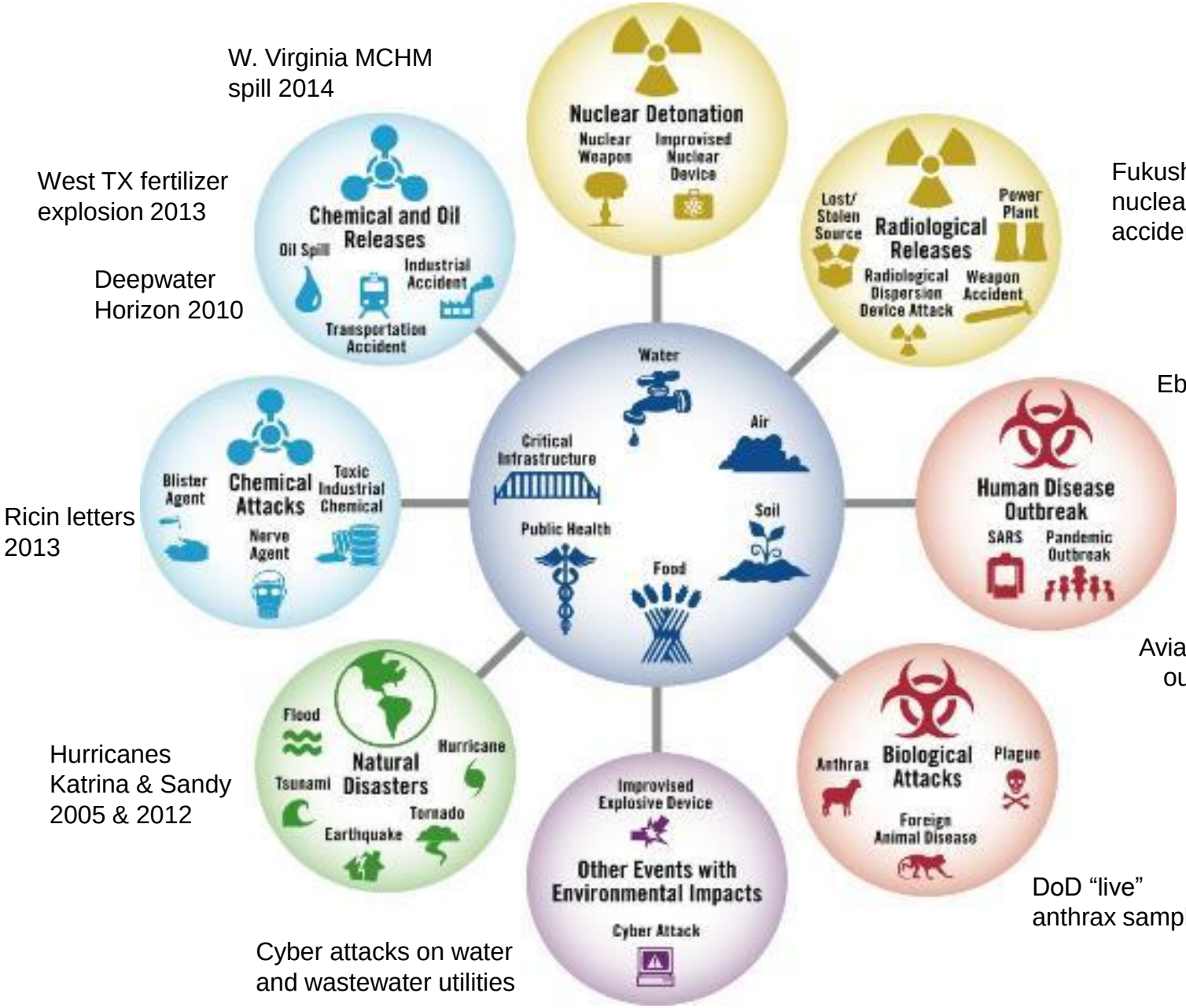
EPA responds to a great variety of environmental emergencies, “all hazards” incidents



W. Virginia MCHM spill 2014

West TX fertilizer explosion 2013

Deepwater Horizon 2010

Fukushima nuclear accident 2011

Ebola outbreak 2014

Ricin letters 2013

Avian flu poultry outbreak 2015

Hurricanes Katrina & Sandy 2005 & 2012

DoD “live” anthrax samples 2015

Cyber attacks on water and wastewater utilities

Figure from: *Refining EPA’s Approach to Homeland Security*, EPA Office of Homeland Security (2011)

S&T challenges always arise in atypical emergency responses

Examples:

Deepwater Horizon

- What is the ecotoxicity of the proposed dispersants?
- Will dioxins be released during the oil burns?

Ricin Letters

- What is the best analytical methods to use to characterize contaminated sites and during cleanup?
- Which cleanup approach is best for the mail handling facility?

Ebola in the U.S.

- What is the fate of ebola virus in sewage systems?
- Which treatment approaches are expected to be effectives in managing the solid medical waste?

Historical EPA Approach to S&T Reachback

Experiences with Hurricane Katrina, Deepwater Horizon, others:

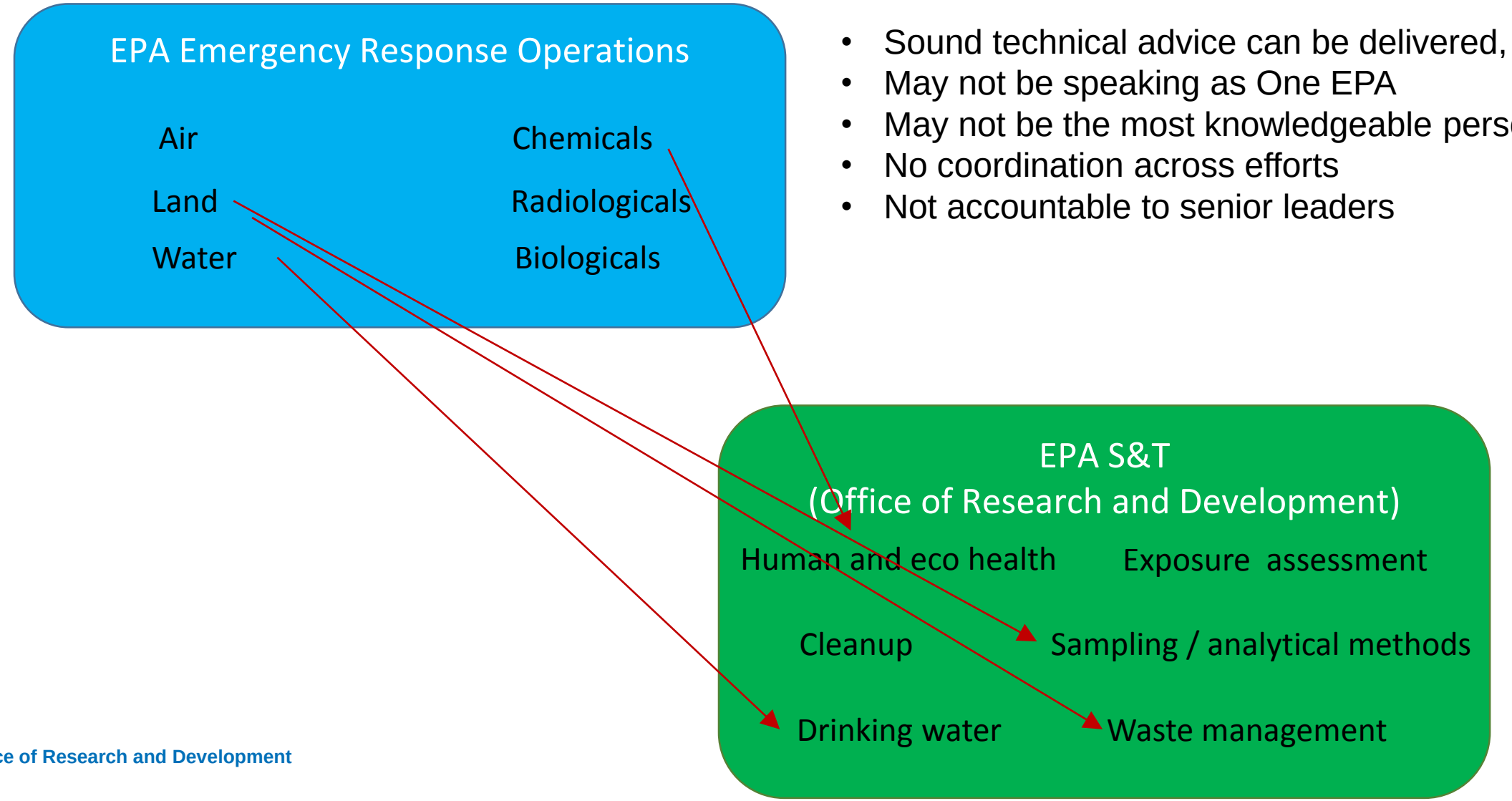
- As technical experts, EPA researchers were called upon for technical advice, short-term studies
- Reaching *ad hoc* into EPA's Office of Research and Development:
  - Connections based on relationships, word of mouth
  - Not necessarily the most appropriate experts
  - Did not promote team-based, multi-disciplinary approaches
  - Often not timely enough, not perceived as high priority

EPA Office of Research and Development

EPA research provides the solutions the Agency and the nation need to meet today's complex environmental and human health challenges

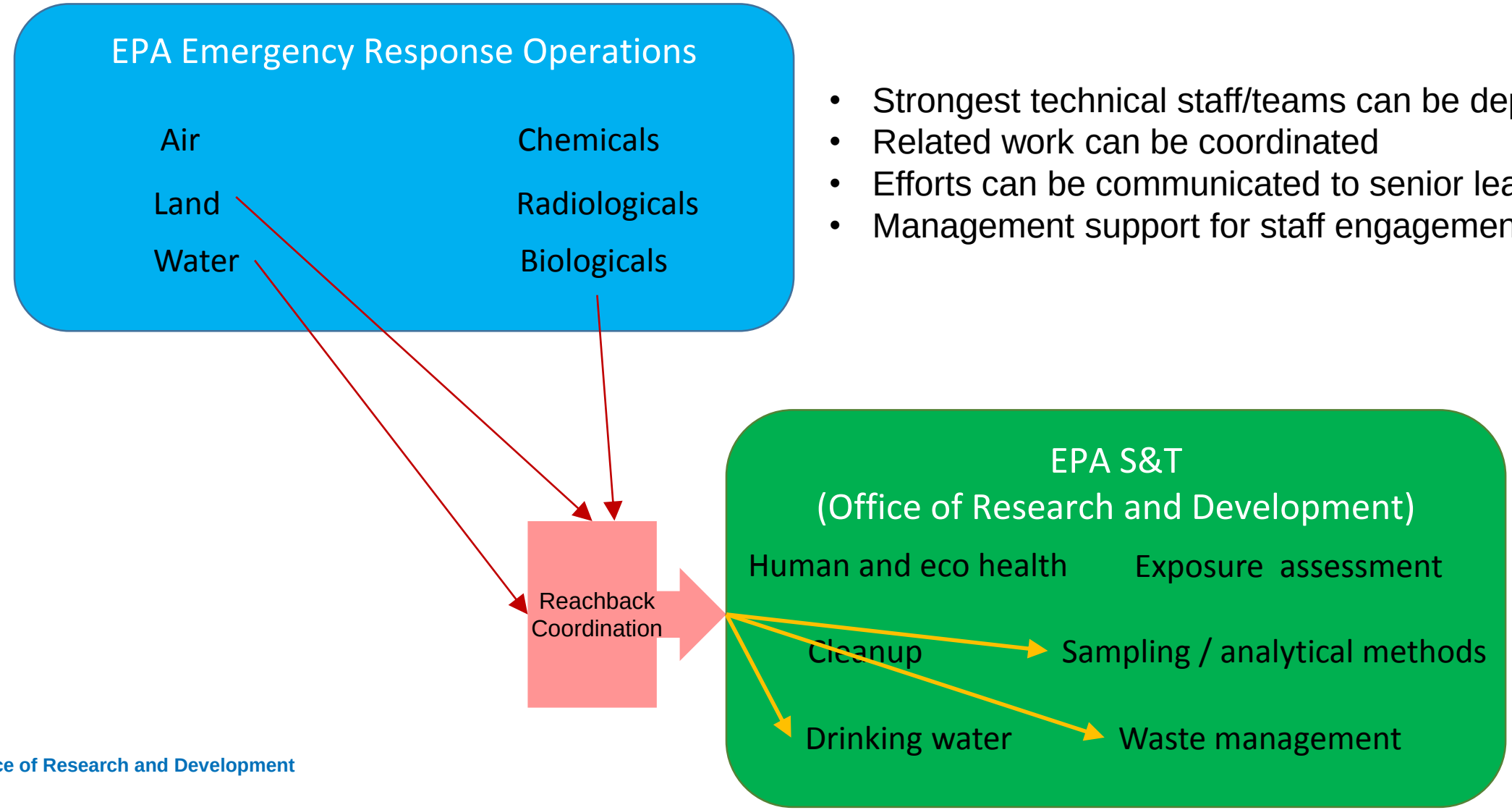
- 1500 staff
- 13 locations

S&T Technical Support – The *ad hoc* Approach



- Sound technical advice can be delivered, but:
- May not be speaking as One EPA
- May not be the most knowledgeable person
- No coordination across efforts
- Not accountable to senior leaders

S&T Technical Support – The *Coordinated* Approach



- Strongest technical staff/teams can be deployed
- Related work can be coordinated
- Efforts can be communicated to senior leaders
- Management support for staff engagement

Building RACER

ReACHback for Emergency Response

We assessed models of emergency response support in EPA regions and other agencies:

- Established standing reachback *coordination* capacity (not standing technical teams)
- **“Ready”** mode - prepare, practice
- **“Response”** mode - triage requests, bring best technical expertise to bear, keep communication lines open, reporting to senior leadership
- Nimble to EPA responses

Example – Charleston, WV MCHM* Spill

The Incident

- January 9, 2014, ~ 7,500 gal of coal processing chemical mixture released from storage tank into the Elk River
- Transported into drinking water distribution system
  - 300,000 people without water for ~4 days
  - ~$61 million impact on local economy**
- Little known about MCHM and the mixture
- Flushing protocol returned water to acceptable levels
- Tank site cleanup followed
- EPA role limited – WV lead effort

S&T Technical Support Provided

- Chemical fate and transport
- Analytical chemistry
- Reviewed drinking water ingestion screening level (CDC)
- Developed vapor inhalation screening level for site cleanup activities

* 4-methylcyclohexylmethanol (MCHM)

** Marshall University Center for Business and Economic Research

Example – Gold King Mine Release, Colorado

The Incident

- August 5, 2015, abandoned Gold King Mine, under remediation activities, accidentally released ~3 million gallons of acid mine drainage into the San Juan River watershed
- Water and sediment contaminated with heavy metals – spiked, then trended back to pre-incident levels
- EPA lead: activates Area Command in Durango, CO, Emergency Operations Center in DC
- Complex coordination: 3 states, Navajo Nation, 3 EPA regions, multiple HQ offices

S&T Technical Support Provided

- Manned ORD Desk at EOC for 2-1/2 weeks
- Reviewed ~~of~~ screening levels for aquatic rec use
- Water quality data review and interpretation
- Standing by with lab capacity, technical expertise
- Reviewed watershed monitoring plan

RACER so far…

Shown to be nimble – adapted to each incident bringing strong S&T expertise to address tough technical challenges:

- West Virginia MCHM spill
- Ebola in the U.S.
- Tulane Primate Center *Burkholderia* release
- Gold King Mine release

Learning as we go…

- Dedicated staff time and senior management involvement needed
- Socialization of this capability throughout EPA is a large task
- Post-incident RACER hot washes invaluable
- Post-incident S&T evaluations would be helpful