EPA Update: Ranges; Alternatives to OB/OD and BIP

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History of OB/OD/BIP Under RCRA

• 1978 – proposed: ban on all OB/OD of hazardous waste
• 1980 – final rule: OB/OD is prohibited, except for explosives/propellants when:
  – There are no safe alternatives, or
  – It is an emergency.

Note: This exemption for OB/OD of explosives was considered temporary pending development of alt technologies.

• 1987 – final 40 CFR Part 264 Subp X rules: includes OB/OD
• Landmark firing range case: Connecticut Coastal Fishermen’s Assoc v. Remington Arms, 2nd Circuit Court of Appeals (1993) [EPA amicus brief, 8/31/92]...two definitions of “solid waste” and “hazardous waste”
  – **Regulatory**: narrowly defined (characteristic; listings)
    • For permitting
  – **Statutory**: more broadly defined
    • Statutory authorities
Statutory & Regulatory Authorities

• **Statutory**
  • RCRA 3004(u); 40 CFR 264.101: SWMUs releases
  • RCRA 3004(v); 40 CFR 264.101: releases beyond fac boundary
  • RCRA 3007: info gathering & inspections, incl. sampling
  • RCRA 3008(a): compliance orders
  • RCRA 3008(h): interim status corrective action orders
  • RCRA 3013: monitoring, analysis, & testing orders
  • RCRA 7003/CERCLA 106/SDWA: imminent & substantial endangerment orders

• **Regulatory**
  • 40 CFR 264/270: permit regs
  • RCRA 3005(c)(3); 40 CFR 270.32(B)(2): omnibus authority to add permit conditions to protect HH&E
Current Status of OB/OD Under RCRA

• OB/OD Universe:
  – 169 RCRA OB/OD facilities
    • 61 operating (26%)
    • 108 closing/closed (64%)
  – Lots of OB/OD outside this universe
    • Range cleanup on range
    • Training
    • Emergencies
  – 54 Superfund OB/OD NPL sites (includes some RCRA)

Operating

DOD  35
DOE   4
NASA  1

Total Fed Govt 40(66%)
Private Sector 21(34%)
EPA OB/OD Activities

• EPA is Documenting OB/OD:
  – Contamination
  – Procedures to Clean Up/Clean Close
    • Site assessments
    • Cleanup procedures
    • Difficulties achieving clean closure
  – Costs to Cleanup/Clean Closure
  – Technical Alternatives
  – Working with ICE, DOD, NAS, DOT, ATF, FBI, DHS, NBSCAB, States
EPA Activities

EPA-DOD OB/OD Workgroup

• Meets Quarterly
• To discuss issues of concern:
  – Contamination
  – Closure/Clean-up of OB/OD Sites
  – Alternatives to OB/OD
  – DOD optimization study
  – Problematic Sites
  – Risk Assessments
OB/OD Contamination

• OB/OD/BIP is relatively uncontrolled, uncontained
• Media
  – Air, Soils, Surface Water, Ground Water
• Contaminants of Concern
  – RDX, TNT, Perchlorate, Metals,
  – UXO, Kick-out
• Characterizing contamination is difficult
  – Legacy sites (i.e., contributions from other sources, e.g. training and testing ranges, manufacturing)
  – Legacy wastes (many waste streams prohibited from OB/OD today were burned pre-RCRA)
  – Inability to adequately monitor air
• But, enough info exists (RCRA, Superfund, Army cold regions/Canadian/SERDP studies) to indicate environmental contamination
OB/OD Contamination Data

• Next slides are worst cases identified.
• Red numbers are the number of times the concentrations in soil or ground water exceed EPA action levels [action levels used are in brackets after each contaminant].
• This data was compiled by two summer interns (Jordan 2014, and Michelle 2015) from RCRA and CERCLA data.
OB/OD Contaminant Data

Soils

- **RDX** [5.6 mg/kg EPA residual screening level]
  - Chemtronics, Inc. 290 mg/kg 52X
  - Camp Minden (LA AAP) 100 mg/kg explosives
- **TNT** [19 mg/kg EPA resid screening level]
  - Umatilla Army Depot, OR 36,045 mg/kg 1897X
  - Chemtronics, Inc. 280 mg/kg
- **Perchlorate** [15 µg/L]
  - Redstone Arsenal (Army/NASA) 106,000 µg/kg 7067X
    - **Note:** legacy site [Thiokol]

- Worst concentrations tend to be close in and further out
OB/OD Contaminant Data (cont.)

**Groundwater**

- **RDX** [2 µg/L]
  - Bangor Ordnance Disposal (Navy) 10,000 µg/L 5,000X
  - Nebraska Ordnance Plant 534 µg/L
  - Mass Military Reservation 370 µg/L, 7300 ft plume
  - Dahlgren Naval Warfare Center 127 µg/L
  - Redstone Arsenal (Army/NASA) 96 µg/L

- **TNT** [2 µg/L]
  - Banger Ordnance Disposal (Navy) 40 µg/L (stormwater) 20X
  - Nebraska Ordnance Plant 39 µg/L

- **Perchlorate** [15 µg/L]
  - Mass Military Reservation 500 µg/L, 10,000 ft plume 33X
OB/OD Cleanup Costs

- **3 contamination zones:**
  - Unit (incl particulate fallout area)
  - Kick-out area
  - Ground water plume

- **Cleanup costs:**
  - Lawrence Livermore Natl Lab (DOE) $627m
  - Ft. Wingate, NM >$202m
  - Air Force Real Property Agency/Castle Air Force Base >$150m
  - Nebraska Ordnance Plant $61m
  - Umatilla Army Depot, OR >$60m
  - Idaho Natl Engg Lab (DOE) $48.3m
  - Iowa Army Ammunition Plant $40.3m
  - US Army Garrison/Ft. Wainwright $10.9m
  - Plattsburgh Air Force Base $8.9m
  - Banger Ordnance Disposal $8.9m
  - Chemtronics, Inc. $6.2-8.2m
  - Aqua Tech Environmental Inc. (Groce Labs) $4.7m
  - Picatinny Arsenal, NJ $3.9m
  - Cecil Field USN Air Station $2.8m
  - US Army/NASA Redstone Arsenal $1.7m
  - Moffett Naval Air Station, CO $1.1m
  - Bangor Naval Submarine Base $.9m
OB/OD Unit Cleanup
- 2,200 multi-increment soil samples (MIS) collected (metals & explosives)
- 1m cu yds soils excavated and screened for munitions & explosives of concern (MEC)
- 25,000 tons haz waste soils sent off-site for treatment/disposal
- 15,000 tons non-haz soils sent off-site for disposal
- 142,000 MEC recovered/destroyed
  - 5.3m lbs metal recycled
OB/OD Closure/Cleanup Costs

• At least 4 sites above $100m
• Many sites > $10m

• Costs for:
  – Site assessments (geophys for UXO/frag/kick-out; soil and groundwater sampling), and
  – Remediation (retrieval of kick-out/UXO; excavation, soil sifting; groundwater plumes)

• Many sites unable to achieve clean closure
  – Close with contamination in place, post-closure/long-term care; institutional restrictions
Alternatives to OB/OD

• NAS 2019 Report [Alternatives for Demilitarization]
  – Alternatives exist for many energetic waste streams
    • Many alternatives currently in use; RCRA-permitted
    • Some wastes still problematic
  – Funding is major obstacle

• EPA Report [Alternatives to OB/OD]
  – Posted on our website
  – Many appropriate for BIP
• Ruled in favor of DOD (Industrial Operations Command) to prohibit OB/OD as an option in its 4/10/96 solicitation for proposals for demilitarization.
  – Based on Congressional concerns with adverse environmental and cost impacts of OB/OD and Congressional intent that OB/OD be phased-out as soon as possible, wherever possible.
  – The fact that no statute bans OB/OD does not prohibit an agency from determinations consistent with legitimate Congressional environmental concerns.
  – In restricting the use of OB/OD, the agency is reasonably acting in response to repeated Congressional concerns about the environmental risks posed by and specific to OB/OD.
• Regarding Emergencies [EPA’s RCRA Military Munitions Rule]:
  – Defined as:
    1) “immediate responses needed” → exemption; or
    2) “imminent and substantial endangerment” → emergency permit
  – Places decision-making with EOD professionals
  – Places contamination concerns with others: owners of the energetics, owners of the land
  – Keep record for 3 yrs: what, when, where, result
• **Factors**
  – Safety: uncertainty; stability; armed?
  – Safe to move?
  – Proximity to people and property
  – Urgency/expediency
  – Number of items
  – Availability of alternatives
  – Contamination/cleanup

• **Alternatives**
  – Robotics
  – Disassembly
  – Case penetration/energetics removal
  – Closed Detonation Chambers
  – Chemical Destruction
  – Thermal Destruction

• **Examples**
  – Mass Military Reservation
    • Apex of recharge zone of designated sole source aquifer
    • Detonation chamber
      – Pier 91: Detonation chamber
      – Camp Hale: BIP
Conclusions Regarding OB/OD

Progress:
- Alternatives demonstrated
- Reliance on OB/OD reduced

But, given OB/OD and BIP:
- Are relatively dirty technologies (relatively uncontrolled with greater potential for contamination)
- Difficult and costly to achieve clean closure
- Full Life-Cycle costs often favor alternatives
- Alternatives exist for many energetic wastes
- Strong Congressional and public interest
- Alternatives Are Safe, Cleaner, Cheaper

OB/OD and BIP should be avoided when:
- Safe to move
- Large quantities involved
- Populations in close proximity
- Safe alternatives exist, including MTUs
- Not an emergency situation
- Future land use
Range Cleanup

• Importance of Site Assessment
  – Historical records; photos
  – Site reconnaissance
  – Enhanced Digital Geo-referenced Technologies
    • EPA-DOD UXO Principles 3/7/00
  – Sampling
Conclusions

• ACTION:
  – Support renewed efforts by DOD and others to:
    • Reassess the use of OB/OD
    • Further develop alternatives
    • Phase out OB/OD where safe alternatives exist
    • Develop procedures to effectively assess and clean up OB/OD contamination
    • Assess case-specific determinations regarding a better way, including MTUs instead of BIP...stay tuned
Thank You

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Questions