BERYLLIUM CONTAMINATION

At The

PORTSMOUTH GASEOUS DIFFUSION PLANT

By

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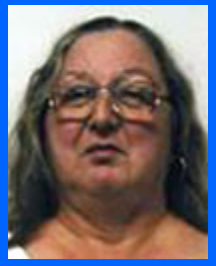
BACKGROUND

- IH Review for Potential Beryllium Exposure at PORTS (1994-5)
- DOE-EH *Independent Investigation of the Portsmouth Gaseous Diffusion Plant,* May 2000 - Limited evidence that Be exposures may have resulted from incidental machining of Be-containing materials, crushing of fluorescent light bulbs, and use of non-sparking tools, bar stock, valves, and welding rods.
- DOE Red Alert for Vitrified Bond Grinding Wheels (Aug. 2000)
- Medical Exams for Current and Former Workers at Gaseous Diffusion Plants Under DOE-Funded PACE Worker Health Protection Program Began in 2001

THE FACES OF WHPP

"I procrastinated taking the physical for two years. As a result of the physical, I was diagnosed with chronic beryllium disease. I am so thankful that WHPP was there and I'll recommend this program to anyone. It could save your life."
Garry Sexton Portsmouth GDP, Chemical Operator, 1988–2006

"I thank WHPP for providing free medical surveillance for former and current workers. I urge you to have this testing done. Your life may depend on it. MINE DID!!!" ***John Watson Portsmouth GDP, Machinist, 1973-2003***



"When it was finally determined I had chronic beryllium disease, I was in total shock. I'd never heard of beryllium let alone that I had been exposed to it. Please have the physical and CT scan. If not for yourself, then do it for your family."
Donna Christman Portsmouth GDP, Uranium Material Handler, 1974–2002

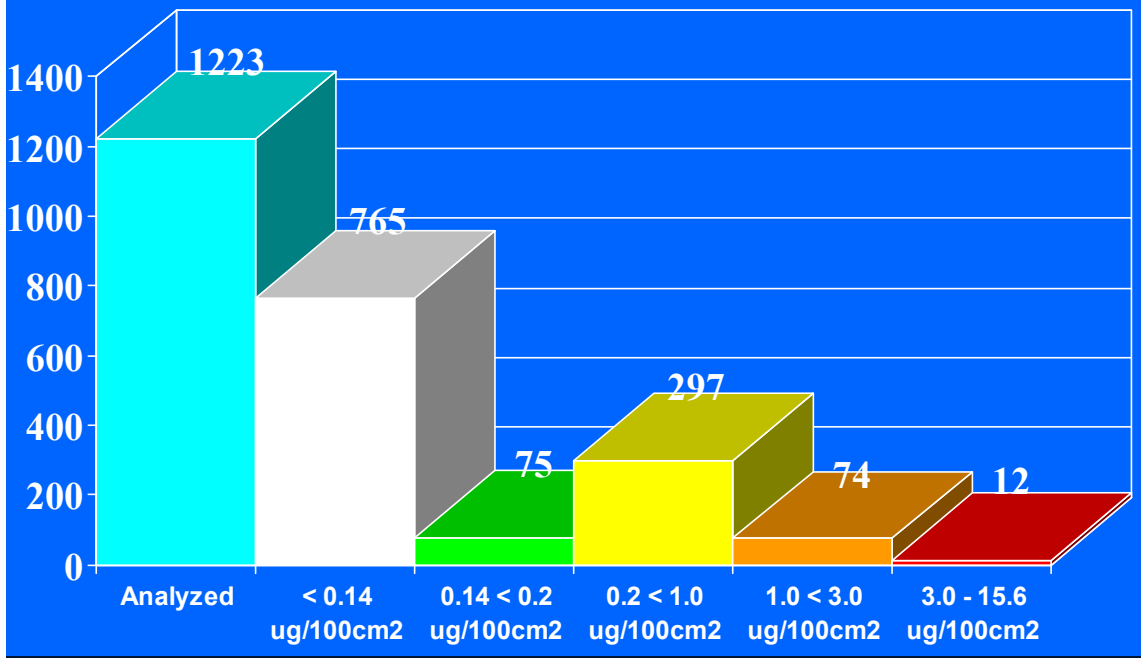
SOURCE: http://www.worker-health.org/portsmouthsuccessstories.html

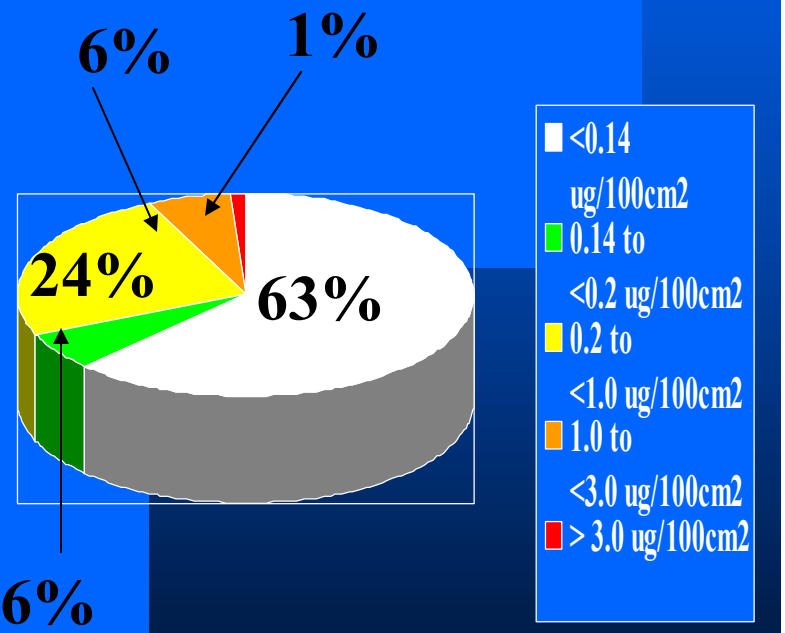
DOE BERYLLIUM CHARACTERIZATION PROJECT

- Performed for 12 Facilities (Dec. 2003 – Sept. 2004)
- Surface Wipes – 1223 Total; 383 (31%) >0.2 µg/100cm^2 (LOC);
  12 (1%) >3.0 µg/100cm^2(LOIC)
- Surface Bulks – 67 Total; 5 (8%) >LCR; Up to 6 PPM (Blast Slag)
- Destructive Analysis – 29 Total; 10 (34%) >LCR; Up to 40 PPM
  in Aluminum Compressor Blades and Spiders
- Air Monitoring – Personal Samples for IH Techs (76); All <LCR
  Work Area Samples (100+); All <LCR

DOE CHARACTERIZATION PROJECT WIPE SAMPLE ANALYSIS TOTALS

1223
Analyzed Wipe Samples





DOE CHARACTERIZATION PROJECT ADDITIONAL ACTIONS

- Benchmarking Visits - Rocky Flats, Honeywell Kansas City, Brush Wellman Cleveland, and National Jewish M&RC
- Conducted Beryllium General Awareness Training For All Employees; Added Info to General Employee Training (GET)
- Conducted Beryllium Cognizant Worker Training for 300+ Employees Working in Areas >LOC
- Initiated BeLPT and Beryllium Worker Training for Employees w/Significant Exposure Potential
- Developed Beryllium Control Procedure (Includes Concerns for Coal-Fired Steam Plant)

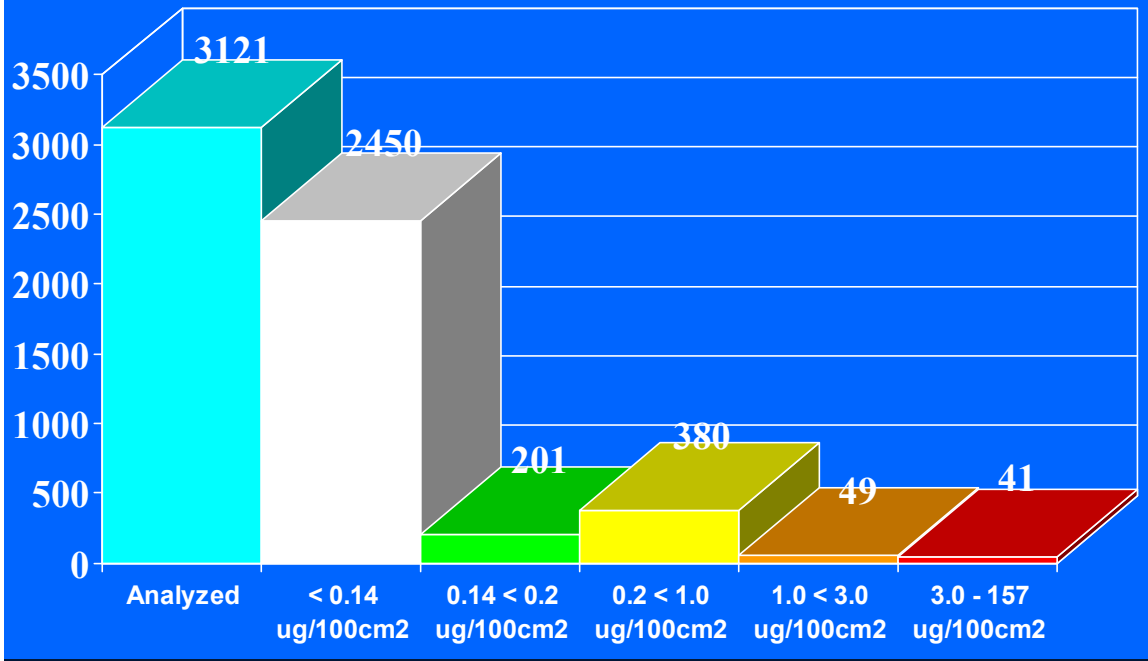
USEC BERYLLIUM SAMPLING AND MONITORING INITIATIVE

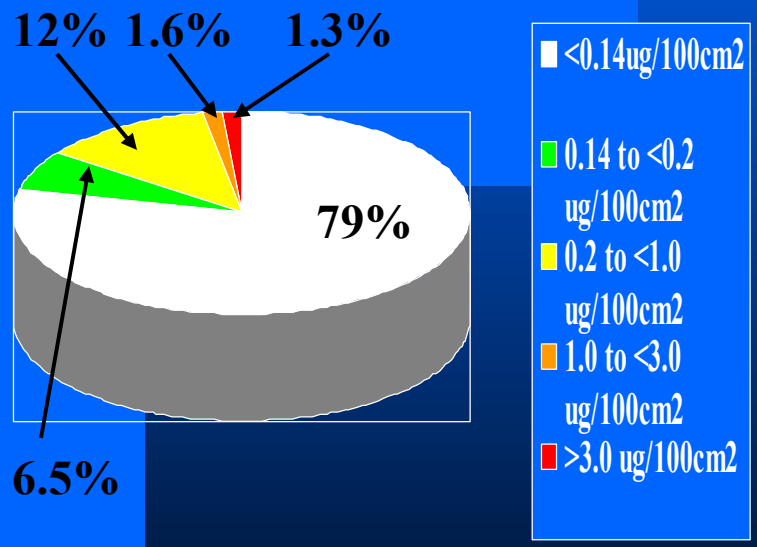
- Sampling Began In January 2004 During DOE Characterization Project and Continues To Present
- Surface Wipe Samples – 3121 Total; 470 (15%) >0.2 µg/100cm^2 (LOC); 41 (1.3%) >3.0 µg/100cm^2 (LOIC)
- Surface Mini-Bulk Samples – 778 Total (Included in Surface Wipe Count Above); 87 (11%) >0.2 µg/100cm^2 (LOC); None >3.0 µg/100cm^2 (LOIC)
- Personal Air Samples – 1031 Total (All Projects); 29 >LCR; 6 (<0.05 µg/m^3 TLV); 10 (0.05<0.2 µg/m^{3}AL); 11 (0.2<2.0 µg/m^{3}PEL); 2 (>2.0 µg/m^3 PEL, i.e., 3.65 and 3.95 µg/m^3)
- Area Air Samples – 639 Total (All Projects); 4 >LCR; 2 (<0.05 µg/m^3 TLV); 1 (0.05<0.2 µg/m^{3}AL); 1 (0.2<2.0 µg/m^3 PEL); None (>2.0 µg/m^3 PEL µg/m^3)
- All 25 Air Sample Results Above the ACGIH TLV of 0.05 MG/M^3 Have Occurred During Activities Involving Ash in the Coal-Fired Steam Plant

USEC BERYLLIUM WIPE SAMPLE ANALYSIS TOTALS (2004 TO PRESENT)

3121

Analyzed Wipe Samples

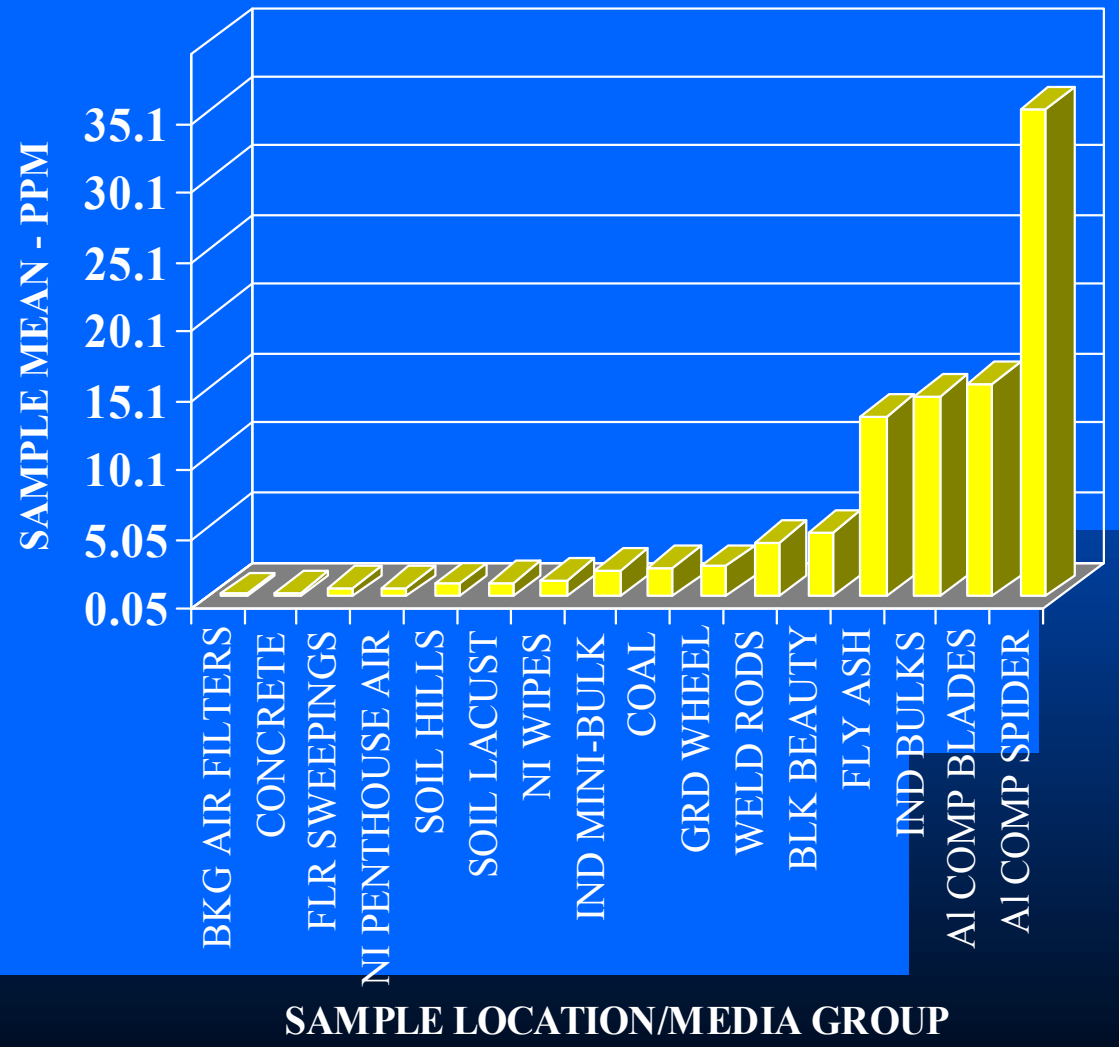




USEC BERYLLIUM GEOLOGY STUDY

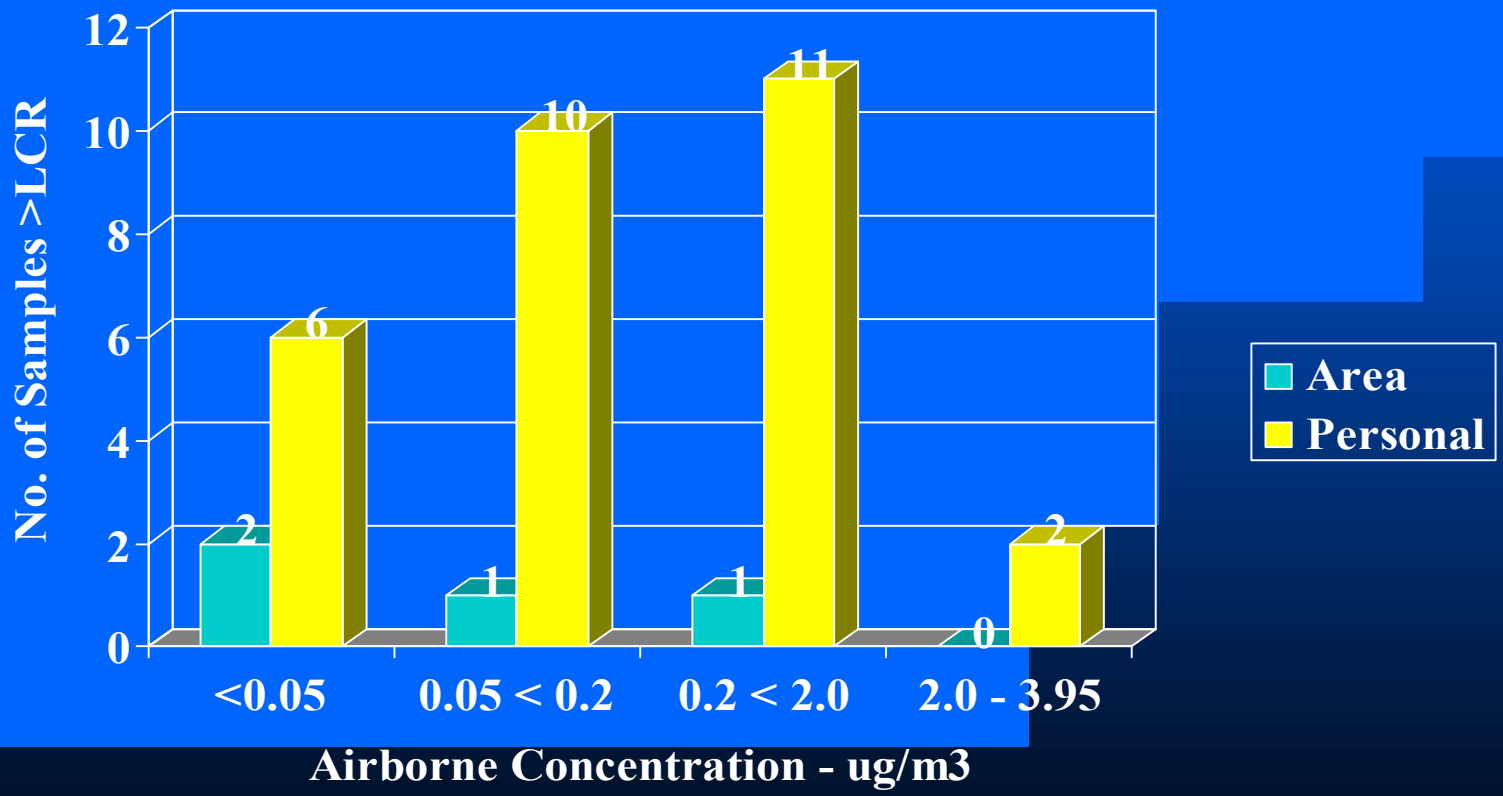
- Pro2Serve, Oak Ridge, TN (Project Design and Report)
- USEC Personnel Collected and Analyzed Samples From Sept. 2006 To Feb. 2007
- Sample Locations Included USEC Leased Facilities and Areas Across Entire DOE Reservation
- Total of 271 Field Samples From 18 Locations or Media Groups
- Included Bulk and Destructive Analysis Samples of Soils; Building Air Handlers; Non-Industrial Work Areas and Office Buildings; Fly Ash; Coal; Concrete; Air Filters; & Ambient Air
- Final Report Issued May 2007 (*Identification of Natural and Anthropogenic Sources of Beryllium at the Portsmouth Gaseous Diffusion Plant, Portsmouth, Ohio,* POEF-USEC-89)
- Determined a 95% Upper Tolerance Limit (UTL) of 2.96 PPM For Composite Background & Non-Industrial Areas
- Maximum Sample Result Was 41.8 PPM (Fly Ash)

GEOLOGY STUDY
SAMPLING SUMMARY



BERYLLIUM AIR SAMPLING
ALL PROJECTS - 2003 TO PRESENT

1031 Personal & 639 Area = 1670 Total Samples
29 Personal & 4 Area = 33 Samples >LCR



SUMMARY

- DOL Approved Cases - 24 CBD and 32 BeS (Oct. 2007)
- The Geological Study of Naturally-Occurring Beryllium Determined a 95% Upper Tolerance Limit (UTL) of 2.96 PPM For Composite Background & Non-Industrial Areas
- Surface Mini-Bulk Sampling Has Largely Replaced Wipe/Bulk Sampling. To Date, 87 Samples >0.2 $\mu g/100cm^2$ Have Been Reviewed & Categorized as Non-Industrial Due to Be <2.96 PPM
- Sampling Has Not Identified Industrial Sources of Beryllium Exposure >40 PPM [Note: Bay-State Grinding Wheels (~1500 PPM Be) and Non-Sparking Tools (20,000 – 40,000 PPM) Not Sampled]
- Airborne Exposures Above the ACGIH TLV of 0.05 MG/M^3 Have Only Occurred During Activities Involving Ash in the Coal-Fired Steam Plant
- The Analytical Method For Air Sample Analysis Has Been Changed To Include Wall-Wiping For Determination of the Inhalable Fraction

JOB CLASSIFICATIONS POSITIVE BeS AND/OR CBD

- Chemical Operator
- Coal-Fired Steam Plant Operator
- Janitor
- Laundry Worker
- Machinist
- Maintenance Mechanic and FLM
- Mobile Equipment Mechanic
- Process Operator and FLM
- Quality Control Inspector
- Security Police Officer
- Uranium Material Handler
- Welder

AREAS OF INTEREST

- ACGIH TLV (0.00005 vs DOE AL of 0.0002 mg/m^3)
- 10 CFR 850 Be-Containing (1000 ppm vs Al @ 40 ppm Be)
- *Management of Items and Areas Containing Low Levels of Beryllium,* Draft DOE Technical Standard SAFT-0103, 2005
- Inhalable Fraction Samples (IOM vs Cassette Wall Wiping)
- BeLPT Reliability (Stress Associated w/Positive Result)
- DOE Beryllium Worker Registry (USEC Not a Participant)
- Be Hazards of Tobacco Smoke, Coal Dust/Ash (Air & Skin)

IN APPRECIATION FOR EXPERT ASSISTANCE

- Elise Allison, PrSM
- Dr. Robert Bistline, RFETS
- Mike Brisson, WSRC
- Kathy Creek, LANL
- Jim Dodson, KCP
- Bill Frede, KCP
- Laurel Davis, LLNL
- Dr. David Deubner, BW
- George Fulton, LLNL
- Dr. Lisa Hooper, SNL
- Jim Jenkins, BWXT
- Marc Kolanz, BW
- Dr. Lee Newman, NJMRC
- Andy Petty, BJLLC
- Dr. Gary Snyder, Pro2Serve
- Paul Wambach, DOE-HQ
- David Weitzman, DOE-HQ
- Gary Whitney, LANL