Health Study Review
Public Meeting

December 17, 2009
6:30 PM

New Jersey City University
Jersey City, N.J.
Public Meeting Overview

- Meeting Purpose and Objectives
- Settlement Overview/Settlement Health Study Requirement
- Chromium-related Health Effects
- Studies Reviewed and Results
- Criteria for Health Studies
- Other Health Topics
  - Groundwater
  - Air Monitoring Program during Remediation
  - Residential Sampling
- Public Comment/Q&A
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Settlement Overview

On June 26, 2009, DEP, Jersey City and PPG signed a settlement in Superior Court where they agreed to work together to clean up PPG’s chromium sites.

The agreement:
- Establishes a 5-year goal to clean up all 20 sites;
- Creates new position of an independent, court-appointed Site Administrator;
- Creates new position of an independent Technical Consultant; and among other things,
- Directs the Site Administrator to recommend chromium health studies, if necessary
Settlement Health Exposure Study Requirement

- Review chromium-related health studies concerning health impacts in Hudson County
- Consult with experts in the field
- If necessary, recommend a health exposure study that would monitor the people living within the vicinity of the Garfield Avenue Site
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Cr(VI)-Related Health Effects

- Respiratory, Nasal, Skin and Kidney effects
- Increased risk of lung cancer
- Depends on dose and exposure route
  - How much and how long
  - How exposed: ingested, inhaled, skin contact
- Most known effects based on epidemiological studies of occupational exposures
  - Workers exposed at much higher levels
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**Studies Reviewed and Results**
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NJ Health Studies reviewed, to date

- An Assessment and Quantitative Uncertainty Analysis of the Health Risks to Workers Exposed to Chromium Contaminated Soils (1991)
- Airborne Concentrations of Cr(III) and Cr(VI) from Contaminated Soils at Unpaved and partially-Paved Commercial/Industrial Sites (1992)
- Chromium exposure assessment of outdoor workers in Hudson County, NJ (1992)
- Field Validation for Sampling and Analysis of Airborne Hexavalent Chromium (1993)
- Designing a biological monitoring program to assess community exposure to chromium: Conclusions of an expert panel (1993)
- Urinary Excretion of Chromium Following Ingestion of Chromite-Ore Processing Residues in Humans: Implications for Biomonitoring (1994)
- Increased DNA-Protein Crosslinks in Lymphocytes of Residents Living in Cr-Contaminated Areas (1995)
- Monitoring Human Lymphocytic DNA-Protein Cross-links as Biomarkers of Biologically Active Doses of Chromite (1996)
- Background Air Concentrations of Cr(VI) in Hudson County, New Jersey: Implications for Setting Health-based Standards for Cr(VI) in Soil (1997)
- Exposure to Chromium Dust from Homes in a Chromium Surveillance Project (1997)
- Community Exposure and Medical Screening Near Chromium Waste Sites in New Jersey (1997)
- The Association of Chromium in Household Dust with Urinary Chromium in Residences Adjacent to Chromate Production Waste Sites (1998)
- Reduction in Residential Chromium Following Site Remediation (2000)
- Analysis of Lung Cancer Incidence Near Chromium-Contaminated Sites in New Jersey (a/k/a Hudson County Chromium Sites) (2008)
- Chromium Exposure and Health Effects in Hudson County: Phase I (2008)
- Characterization of Hexavalent Chromium Concentrations in Household Dust in Background Areas (2009)
- Derivation of an Ingestion-Based Soil Remediation Criterion for Cr\(^{6+}\) Based on the NTP Chronic Bioassay Data for Sodium Dichromate Dihydrate (2009)

Chromium Cleanup Partnership
Health Experts Consulted, to date

- **Barbara Beck**, PhD, DABT, FATS - Gradient Corporation and Harvard University
- **Kathy Black, PhD** – Environmental & Occupational Health Sciences Institute
- **Max Costa**, PhD - New York University School of Medicine
- **Jerald Fagliano**, MPH, PhD - NJ Department of Health & Senior Services
- **Michael Gargas**, PhD - formerly of Sapphire Group
- **Michael Gochfeld**, MD, PhD - Environmental & Occupational Health Sciences Institute
- **Sumi Hoshiko**, MPH - California Dept. of Public Health, Environmental Health Investigations Branch
- **Janet Kester**, PhD - NewFields
- **Paul Lioy**, PhD - Environmental and Occupational Health Sciences Institute
- **Eileen Murphy**, PhD - NJDEP, Division of Science, Research & Technology
- **Racquel Stephenson**, MPH - ATSDR Region 2
- **Alan H. Stern**, Dr. PH - NJDEP Office of Science, Research & Technology
- **Joan Strawson**, MS, JD - Toxicology Excellence in Risk Assessment
- **Melvyn Tockman**, MD, PhD – H. Lee Moffitt Cancer Center and Research Institute, University of South Florida
- **Marilyn Underwood**, PhD - California Department of Public Health, Environmental Health Investigations Branch
- **Anatoly Zhitkovitch**, PhD - Brown University, Division of Biology and Medicine
Health Studies Reviewed

- Studies Specific to New Jersey
  - Health Studies in 1990s
  - Household Dust Studies, 2006-08 (EOHSI)
  - Lung Cancer Incidence Study, 2008 (DHSS)

- Studies Outside New Jersey
  - Community Studies (published 2001-09; data from 1970s-2000s)
  - Occupational Studies (1980s -2009)
1990s Hudson County Studies Summary Results

- Early 1990s studies showed correlation between proximity to CCPW sites and level of total Cr in household dust
- Children in households with elevated Cr in dust had higher Cr in urine
- Follow-ups at homes near CCPW sites that were remediated showed significant decline in total Cr in household dust
Chromium in House Dust Pre v. Post-remediation

- In 1992-93 study, homes were identified as having had high (> 500 ppm), medium (100-500 ppm) or low (< 100 ppm) total Cr in house dust
- 23 homes re-sampled in 1996-98
- Homes primarily from 3 neighborhoods: Metrofield, Siedler/Madison, Dwight St./Stegman St.
- Previously high and medium-level homes saw approx. 85% decline in Cr concentrations
  - High-level: median declined from 739 ppm to 50 ppm
  - Medium-level: median declined from 245 ppm to 34 ppm
Reduction in Residential Chromium Following Remediation

**Median Total Cr Concentration in Household Dust, ppm**

- **Initial Visit 1992-1993**: Median Total Cr concentration in High Cr Homes was 739 ppm, and in Medium Cr Homes was 245 ppm.
- **Resampling 11/96-1/97**: Median Total Cr concentration in High Cr Homes was 75 ppm, and in Medium Cr Homes was 47 ppm.
- **Resampling 6/97-2/98**: Median Total Cr concentration in High Cr Homes was 50 ppm, and in Medium Cr Homes was 34 ppm.
145 Jersey City Sites identified in 1980s

Since then:

- 50 sites entirely cleaned up (NFA)
  - Approximately 40% of all Jersey City Chromium Sites have been investigated and cleaned up
  - 46 PPG sites cleaned up
- 19 investigated and found not contaminated
- 76 awaiting cleanup, but capped or underground
  - 18 PPG sites now under 5-year Master Schedule cleanup

6 PPG
Cr(VI) in Air: Standards vs. Measured Values

Cr(VI) Concentrations, ng/m³

- OSHA Permissible Exposure Level: 5000 ng/m³
- Honeywell Risk-Based Standard: 420 ng/m³
- Honeywell Monitored Mean 2004-2009: 2.4 ng/m³
- Garfield Avenue Measured 2007: 2.14 ng/m³

Honeywell Monitored Mean 2004-2009

Garfield Avenue Measured 2007
Health Studies Presentation

- EOHSI - Cr(VI) in Dust
- DHSS - Lung Cancer
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Key questions for any community health study are:

1. Will the data gathered to detect a specific contaminant (chromium waste) aid in the prevention of disease or health effect?
2. How will the information be used to:
   1. Protect community health;
   2. Address community concerns; and
   3. Take appropriate action?
3. Are there programs/resources in place to act on findings, if necessary?
4. What follow-up will occur and who is responsible?
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Public Comment/Q&A
Jersey City does not use groundwater for its drinking water supply.

Clean, uncontaminated drinking water in Jersey City comes from Boonton Reservoir, located in Morris County, and Split Rock Reservoir in Rockaway.

Contaminated groundwater will be treated as part of the cleanup plan, but will not be used as drinking water.
Other Health Topics, continued

- Air Monitoring During Remediation
  - Cleanup will be conducted using proven dust-control practices
  - A combination of permanent and mobile Air Monitoring Stations will continuously check to make sure that safe conditions are maintained during all cleanup activities
  - Work will be halted if conditions require

- Residential Inspection and Sampling
  - Workshop January 21, 2010
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How to Reach Us

- **Phone:** 201-777-2099
- **E-mail:** Info@chromecleanup.com
- **Mail:** Chromium Cleanup Partnership
  P.O. Box 15981
  Jersey City, N.J. 07305
- **Visit:** Stop by the PPG-operated
  Garfield Avenue Renewal Company office
  at 334 MLK Drive, Jersey City
Next Public Meeting

- **Topic:** Workshop on residential chrome sampling and cleanup program
- **Date:** January 21
- **Time:** 6:30 p.m.
- **Location:** Bethune Center
  140 Martin Luther King Drive
  Jersey City