

# **Historic Pesticide Contamination**

**Kevin Schick**

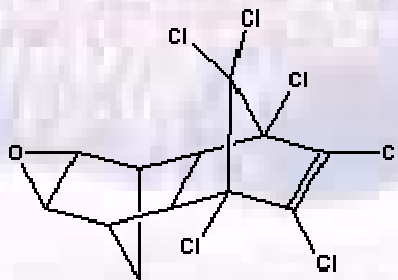
**New Jersey Department of Environmental Protection  
Bureau of Environmental Evaluation and Risk  
Assessment  
(609) 984-1825**

**A wide variety of pesticides have been used in New Jersey over the last 100 years. Arsenic-based pesticides were used extensively to control agricultural pests in fruit orchards, vegetable fields, golf courses and turf farms, from the turn of the century until the late 1960s.**

**Organochlorine pesticides, such as, DDT, aldrin, dieldrin, chlordane, toxaphene, lindane and methoxychlor were developed in the 1940's. They were used extensively for a wide range of insect pests on vegetables and fruits throughout the 1950s, 60's and 70's. These pesticides tend to bind tightly to the soil, most often in the surface layer and are persistent in the environment and thus may be present in the soil long after they have been applied.**

# Dieldrin

**Dieldrin [CAS #60-57-1] -1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-exo-5,8-dimethanonaphthalene**



**1948 - Dieldrin & aldrin discovered**

**1970 – EPA cancelled registration for certain aquatic uses**

**1974 – EPA cancelled registration for most uses except as termiticides**

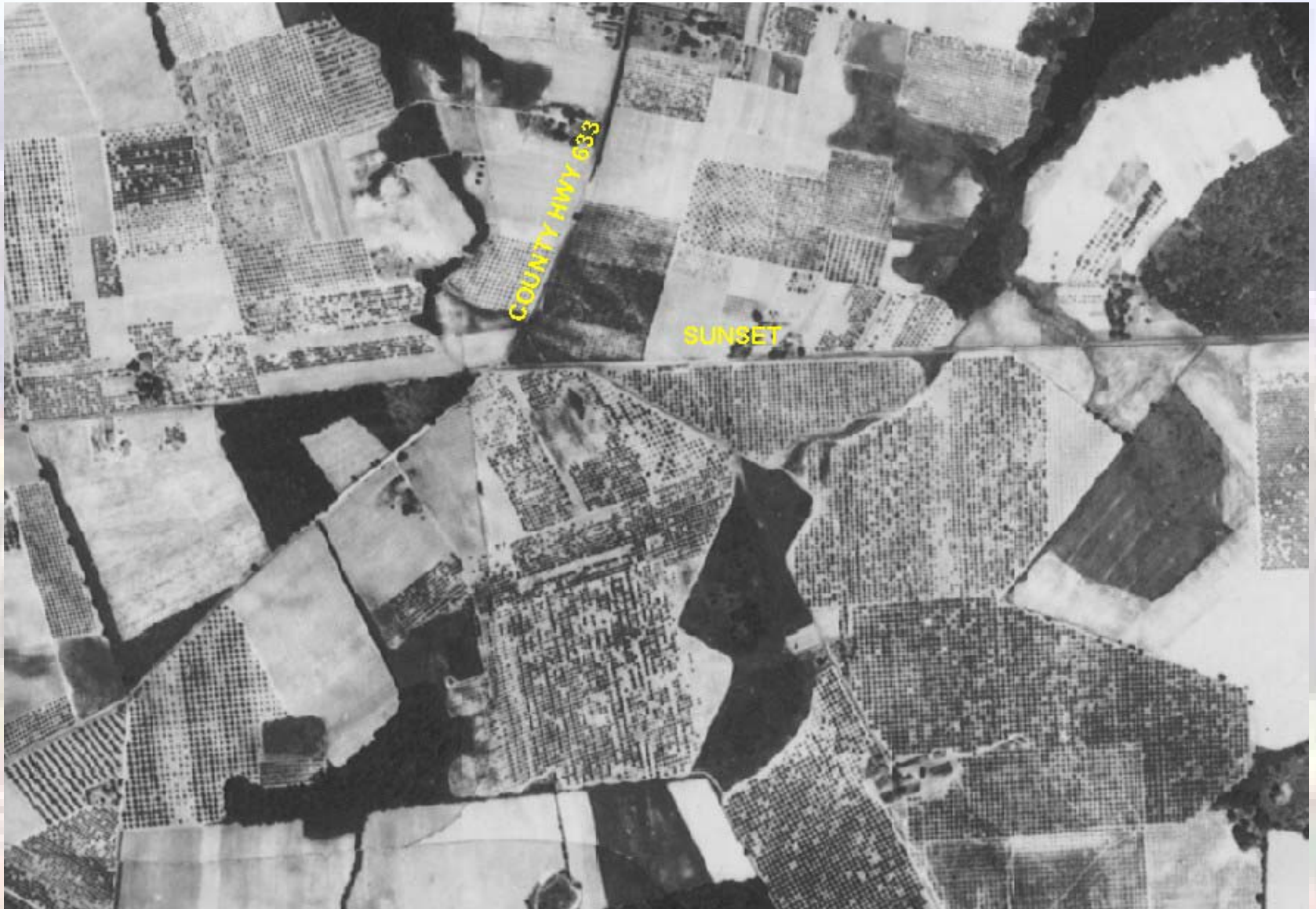
**1987 – Sole manufacturer of dieldrin & aldrin voluntarily cancels registration**

**Half-life of dieldrin in soil is 2.5 – 4 years**

**As long as the pesticide contaminated land stays farmland, the human health exposure is limited. Problems may arise when farmland is developed and human exposure increases. The primary concern is for long-term ingestion of contaminated soil, particularly by children.**

**In early 1996, soil sampling data showed that homes in two Burlington County developments were built on soil containing pesticide residues with concentrations of arsenic, DDT and its metabolites, and dieldrin above the Department's residential soil cleanup criteria.**

# 1930 Aerial Photo – Burlington Heights/Sunset Ridge



# 1995 Aerial Photo – Burlington Heights/Sunset Ridge



## 2002 Aerial Photo – Burlington Heights/Sunset Ridge



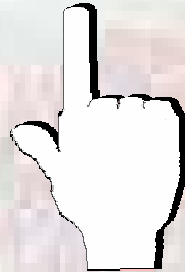
**The finding of pesticide residuals on properties undergoing development caused a ripple effect throughout the building, real estate, banking and farming communities.**

**At the request of NJDEP Commissioner Robert Shinn, an informal, interagency task force started meeting in July 1996 to address the issue.**



**The Task Force released its Final Report in March 1999. The full text of the Task Force Report is available on the Internet at:**

**<http://www.state.nj.us/dep/special/hpctf>**





# **Final Report**

## **Findings and Recommendations for the Remediation of Historic Pesticide Contamination**

**Historic Pesticide Contamination Task Force**  
**Final Report - March 1999**

### **Historic Pesticide Contamination Task Force Members**

Stuart Cameron, New Jersey Bankers Association  
Greg DeLozier, New Jersey Association of Realtors  
Peter Furey, New Jersey Farm Bureau  
Pat Halbe, New Jersey State League of Municipalities  
Zane Helsel, Rutgers the State University of New Jersey  
Gary Mount, NJ Agricultural Community  
Jane Nogaki, New Jersey Environmental Federation  
Dr. Daniel Wartenberg, University of Medicine & Dentistry of New Jersey  
Nancy Witterberg, New Jersey Builders Association



State of New Jersey  
Christine Todd Whitman, Governor  
New Jersey Department of Environmental Protection  
Robert C. Shinn, Commissioner  
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<http://www.state.nj.us/dep/special/hpctf>

Copies available from the [Office of Maps and Publications](#)

March 1999

## **Among the Task Force's Recommendations:**

- **Soil sampling should be conducted when an agricultural property changes land use (i.e. farmland developed into a housing development or *municipal park*).**

## **Site Investigation sampling is comprised of:**

- Discrete soil samples taken at a depth of 0-6" within farm fields;**
- Sampling frequency dependent on the size of the site: Sites <1-10 acres, 1 sample for every 2 acres with a minimum of 2 samples; then sites >10 acres add 1 sample for every 5 acres. A reduced sampling frequency may be appropriate for very large sites;**
- Samples analyzed for arsenic, lead and a pesticide scan. The pesticide scan includes a total of 20 compounds including DDT, DDD, DDE, dieldrin and chlordane.**

**If no pesticide residues are detected above the Department's residential soil cleanup criteria, then no additional action is required. A formal "No Further Action" determination can be requested from the Department, but is not required.**

**If pesticide residues are detected above the residential soil cleanup criteria, the contamination must be reported to the NJDEP. Typically NJDEP oversight is requested under the Voluntary Cleanup Program.**

**Further site investigations are conducted to delineate the horizontal and vertical extent of contamination. A range of remedial options are evaluated and a selected option is presented to the Department for review and approval.**

## **Several Remedial Options are described in the Task Force's recommendations for historic pesticide contaminated soil.**

- **Contaminated soil can be consolidated and covered on-site under buildings, roads, or other areas approved by the Department. This option would require the filing of a deed notice.**

- **Contaminated soil can be capped with clean topsoil (caps are typically one foot or more thick). This option would require the filing of a deed notice.**

- **Contaminated soil can be removed from the site and disposed of as a waste or reused with the Department's approval and be replaced with soil that meets the NJDEP residential soil cleanup criteria. This option would not require the filing of a deed notice.**

## **Remedial Options Unique to Historic Pesticides**

- **Contaminated soil can be blended with clean soil within the contaminated area (the area of concern). This option would not require the filing of a deed notice if residential soil cleanup criteria achieved following blending.**

- **Contaminated soil may be blended with clean soil outside the area of concern, but within the site. This option would not require the filing of a deed notice if residential soil cleanup criteria achieved following blending.**

# **NJDEP Soil Cleanup Criteria**

**Legislative mandate to create soil cleanup criteria based upon an additional cancer risk of 1 in a million**

**Residential/Unrestricted - Direct Contact Soil Cleanup Criteria –**  
based upon a 1 in a million increased cancer risk with a 30 year exposure ingesting 100-200 mg soil/day and a 70 year lifespan

**Non-Residential/Restricted Direct Contact Soil Cleanup Criteria -**  
based upon a 1 in a million increased cancer risk with a 25 year exposure and a 70 year lifespan



# **Residential Direct Contact Soil Cleanup Criteria for Most Commonly Detected Historic Pesticides**

<b>Arsenic</b>	<b>20 ppm *</b>
<b>Lead</b>	<b>400 ppm</b>
<b>Dieldrin</b>	<b>0.042 ppm</b>
<b>DDT</b>	<b>2.0 ppm</b>
<b>DDD</b>	<b>3.0 ppm</b>
<b>DDE</b>	<b>2.0 ppm</b>
<b>Chlordane</b>	<b>0.27 ppm</b>

**\* Arsenic based on default 20 ppm background or site-specific natural background as established in N.J.A.C. 7:26E-3.10**

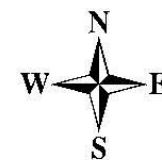
## **Recent Historic Pesticide Issues at Schools**

Historic pesticides are impacting the siting of new school facilities on previously undeveloped farmlands.

**Case in point – Upper Freehold Regional Middle School**

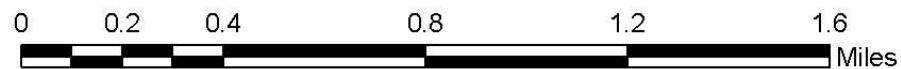
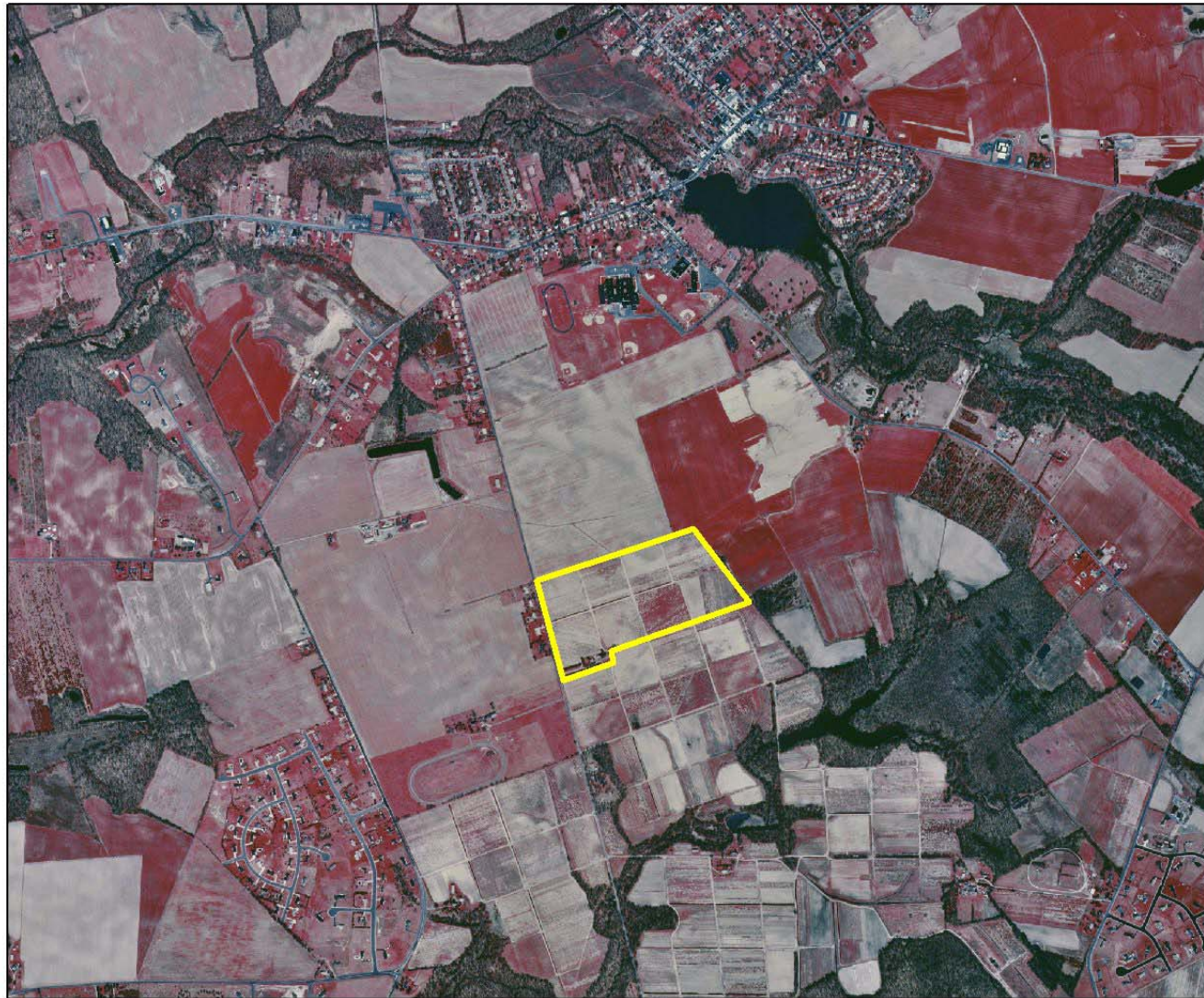
# Allentown - Upper Freehold Region - Overview

1930 Aerial Photographic Base Map



# Allentown - Upper Freehold Region - Overview

1995 Aerial Photographic Base Map



# Allentown - Upper Freehold Region - Overview

2002 Aerial Photographic Base Map



# Proposed Upper Freehold Middle School Pesticide Data

Contaminant	Range (ppm)	Average (ppm)	RDCSCC *
Dieldrin	ND - 0.584	0.042	0.042
Arsenic	4.0 – 42.6 Natural Background	11.2	20 **
Lead	ND – 20.5	11.3	400

\* RDCSCC = Residential Direct Contact Soil Cleanup Criteria

\*\* Arsenic based on default 20 ppm background or site specific background as determined by N.J.A.C. 7:26E-3.10

## Recent Historic Pesticide Issues at Schools

Historic pesticides are impacting the citing of new school facilities on previously undeveloped farmlands.

Historic pesticides and higher level termiticide applications are being detected at existing schools and are impacting construction/renovation projects.

**Case in point – West Brook Middle School in Paramus**

## West Brook Middle School

Soil was excavated from adjacent to the school foundation during renovation of HVAC and electrical systems and stockpiled onsite. Stockpiled soil was found to contain elevated levels of pesticides.

Soil pile composite sample contained:

**Chlordane – 1.97 ppm (RDCSCC = 0.27 ppm)**

**Aldrin – 1.58 ppm (RDCSCC = 0.040 ppm)**

**Dieldrin – 1.53 ppm (RDCSCC = 0.042 ppm)**



# West Brook Middle School - Paramus, Bergen County

2002 Aerial Photographic Base Map



West Brook Middle School  
Block 5003, Lot 7  
25.06 Acres



1:3,753

## **West Brook Middle School**

The Mayor closed the school by emergency proclamation on May 30, 2007.

NJDEP conducted an emergency removal of the soil pile (approx. 120 cubic yards) and surrounding soils on May 31, 2007 and collected and split 17 pre and post-removal soil samples three ways (total of 54 samples).

Some soil results still exceeded RDCSCC and additional investigations are continuing under an MOA.

To date approximately 110 indoor wipe samples, 3 indoor air samples and more than 60 soil locations have been sampled.



**Thank You**