

The background features a blue gradient with abstract shapes and scientific symbols. On the left, there is a vertical ruler-like scale. In the upper left, there are chemical structures and mathematical expressions:  $\pi^2 \times \frac{3}{3} = 2/7248$ ,  $\alpha^2 \times 72$ ,  $H_2O$ , and  $(N-73)$ . The main title is centered in bold black text, and the author's name and affiliation are in white text below it.

# Management on Pesticide POPS Waste and Contaminated Sites in China

Huang Zechun  
Institute of Solid Waste Management and Pollution Control  
Chinese Research Academy of Environmental Sciences (CRAES)  
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# Production and Use of Pesticide POPs in China

## Pesticide POPs in Convention's Annex A

- Aldrin,
- Endrin,
- Dieldrin,
- Toxaphene.
- Chlordane,
- Heptachlor,
- Hexachlorobenzene,
- Mirex

## Pesticide POPs in Convention's Annex B

- DDT

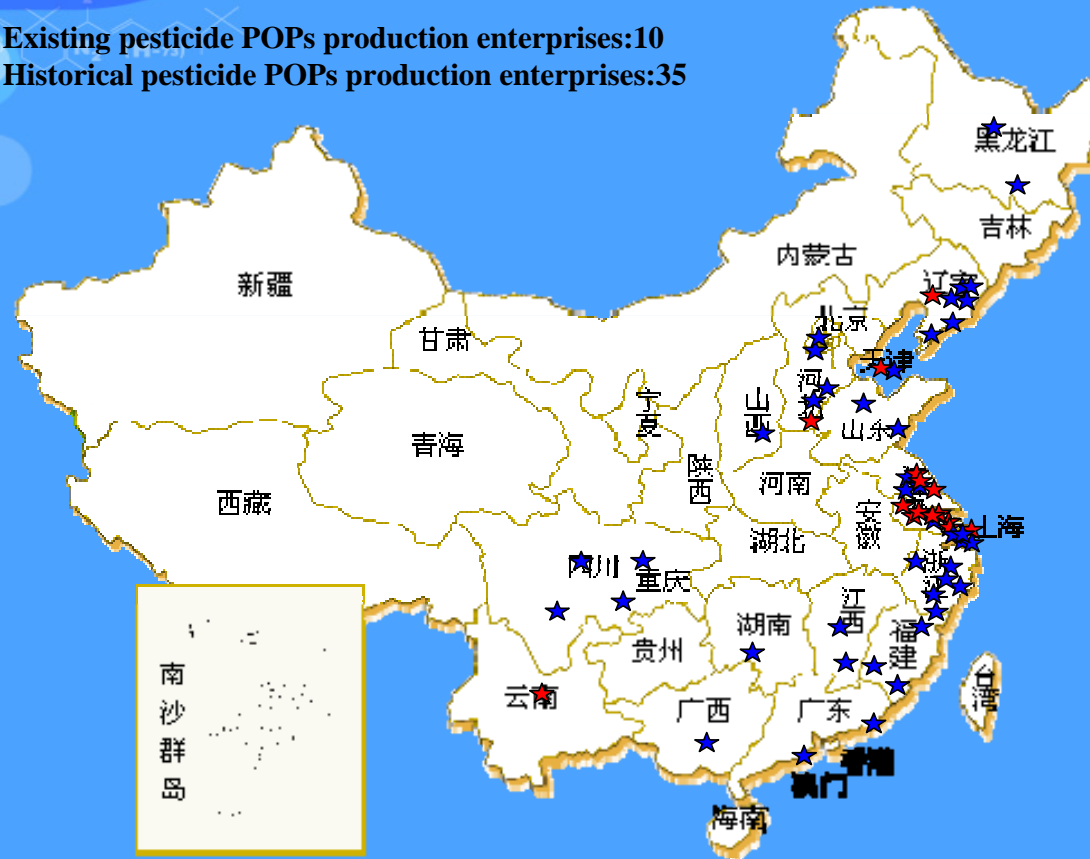
## China produce

- Toxaphene,
- Heptachlor,
- Hexachlorobenzene (HCB),
- Chlordane,
- Mirex
- DDT

Aldrin, Dieldrin and Endrin, only synthetic experiments carried out in China and no industrial production.

# Enterprises Produce Pesticide POPs in Annex A

- ★ Existing pesticide POPs production enterprises:10
- ★ Historical pesticide POPs production enterprises:35



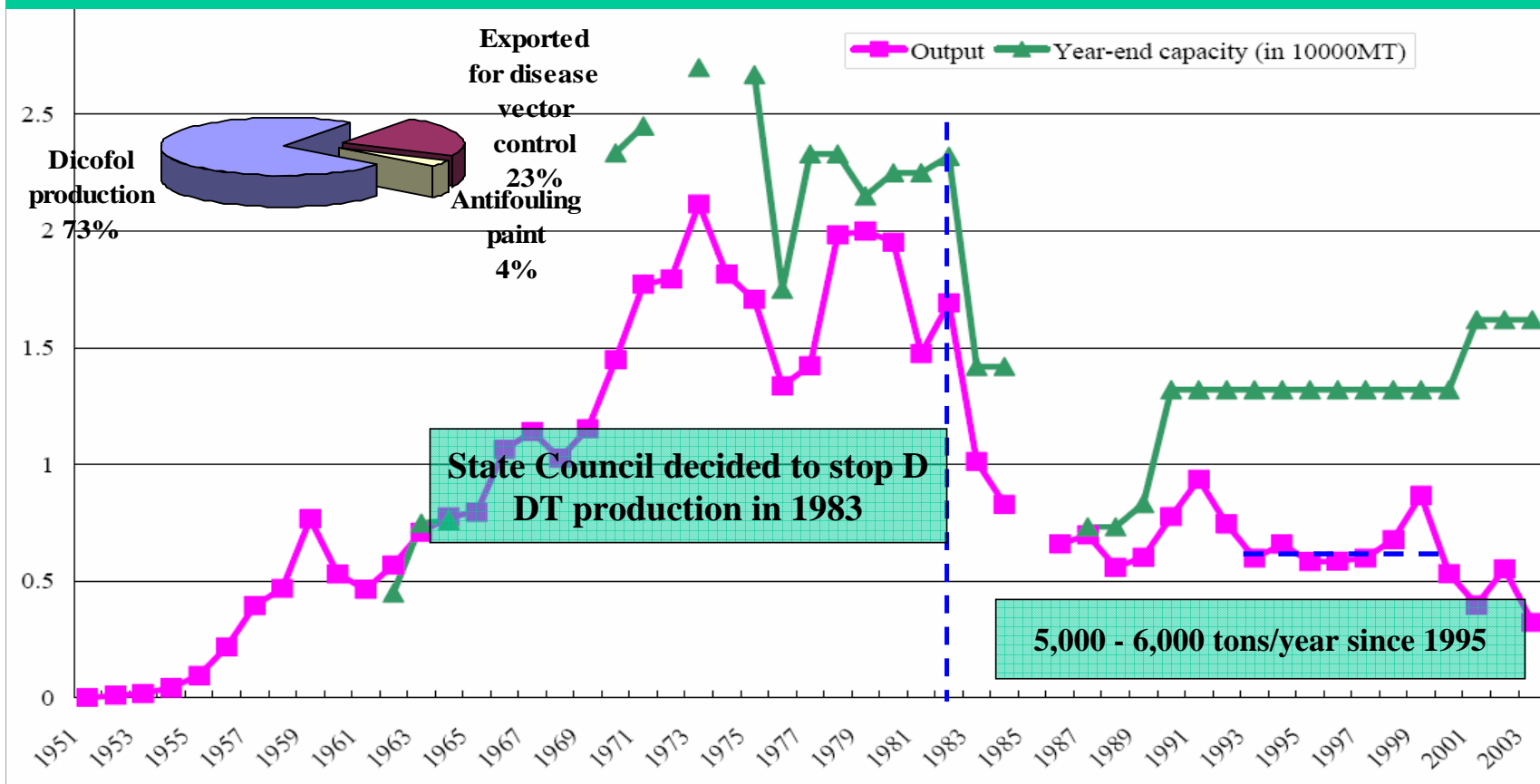
- 45 enterprises (including primary synthesis and secondly composing )
- 18 provinces and municipalities of china included

## Production and Uses of Pesticide POPs in Annex A at the End of 2004

| Type                     | Status               | Prod. Cap. (tons/year) | Yield (tons/year) | Num. of Prod. Unit | Highest historical Output (tons/year) | Accumulated output (tons) | Uses                           |
|--------------------------|----------------------|------------------------|-------------------|--------------------|---------------------------------------|---------------------------|--------------------------------|
| Chlordane                | In Prod. and use     | 1,760                  | 363               | 5(20)              | 843 (1999)                            | ~9,000                    | Termite prevention and control |
| Mirex                    |                      | 677                    | 15                | 3(7)               | 31 (2000)                             | ~160                      |                                |
| Hexachloro Benzene (HCB) | stopped in 2004      |                        |                   | (6)                | 7,365 (1990)                          | >79,278                   | PCP raw materials              |
| Toxaphene                | stopped in the 1980s |                        |                   | (16)               | 3,740 (1973)                          | 20,660                    | Agriculture                    |
| Heptachlor               |                      |                        |                   |                    | 11 (1968)                             | <100                      | Railway crossties              |

**\*In terms of aldrin, dieldrin and endrin, there were only synthetic experiments carried out in China and no industrial production.**

# Production and Use of DDT



| Num. of Prod. Unit | Highest historical Output (tons/year) | Accumulated output (tons) |
|--------------------|---------------------------------------|---------------------------|
| <b>3(11)</b>       | <b>21,164</b>                         | <b>464,000</b>            |

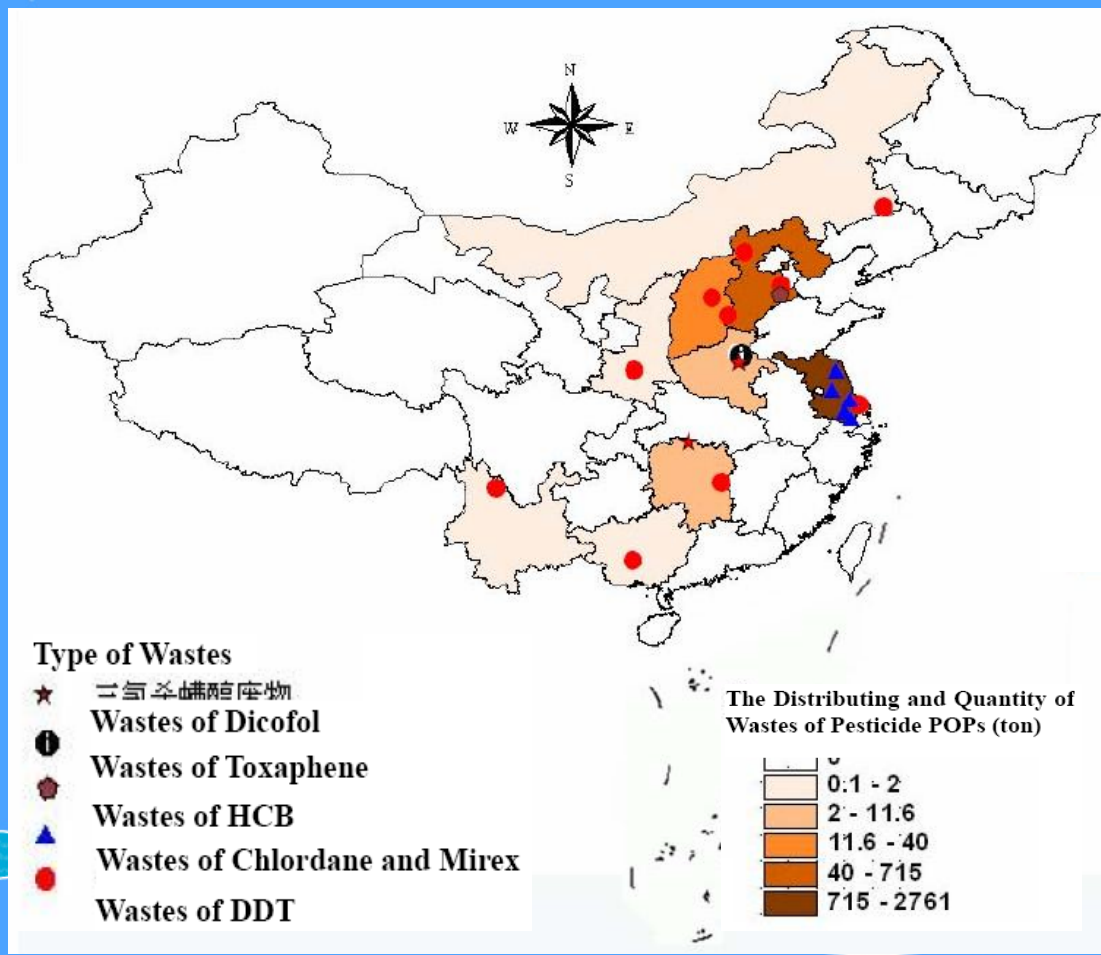
## Pesticide POPs Wastes (Obsolete pesticide, contaminated facilities and container)

| Field                           |   | DDT              | Chlordane<br>and Mirex | HCB          | Toxaphene | Total            |
|---------------------------------|---|------------------|------------------------|--------------|-----------|------------------|
| In<br>Production<br>Enterprises | Number of enterprises                                   | 13               | 21                     | 6            | 16        | 55               |
|                                 | Number of surveyed<br>enterprises                       | 9                | 9                      | 2            | 2         | 22               |
|                                 | Estimated waste<br>quantity (ton)                       | 2400~2800        | 1380~1510              | 60~70        |           | 3840~4380        |
| In<br>Circulation<br>Field      | Estimated waste quantity<br>in agriculture (ton)        | 164~1640         |                        |              |           | 164~1640         |
|                                 | Estimated waste quantity<br>in public health area (ton) | 55~73            |                        |              |           | 55~73            |
|                                 | Estimated waste quantity<br>in construction area (ton)  |                  |                        |              |           |                  |
| <b>Total waste<br/>(ton)</b>    |   | <b>2619~4513</b> | <b>1380~1510</b>       | <b>60~70</b> |           | <b>4059~6093</b> |



# Distribution of Pesticide POPs Wastes

(for which the location and quantity has been confirmed)



# Storage Sites in Distribution Field





# Pesticide POPs Contaminated Sites

Pesticide POPs contaminated sites mainly occur in the field of production, with major types :

- ◆ **Original pesticide production sites**
- ◆ **Waste storage sites in the process of production**

Most pesticide POPs production enterprises in the 1960's and 1970's, produced in simple and crude equipment, primitive techniques and no pollution control facilities.

- ◆ **Storage sites**

where toxic and hazardous wastes are centralized after pesticide enterprises changed business or closed

# Contaminated Site



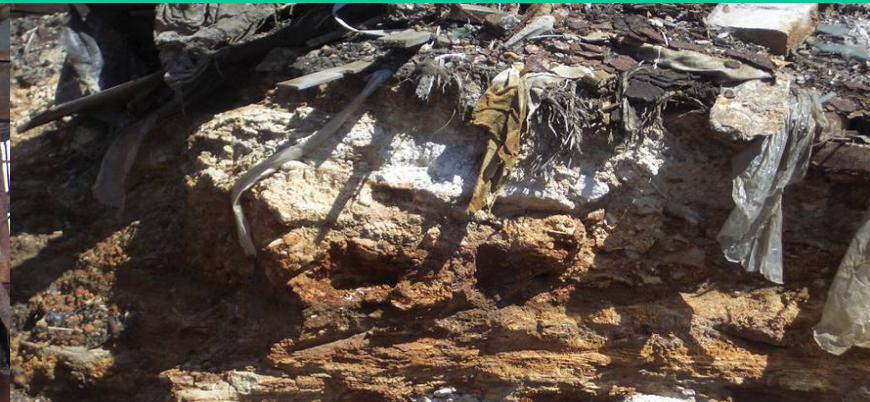
Original production site (DDT)



Storage site (DDT)



Production site (Chlordane & Marex)



Storage site (HCH & Lindane)

# Field Survey on Pesticide POPs Manufacturers

44 identified  
contaminated sites

22 investigated  
and sample

4 evaluated

➤ 2 DDT manufacturers

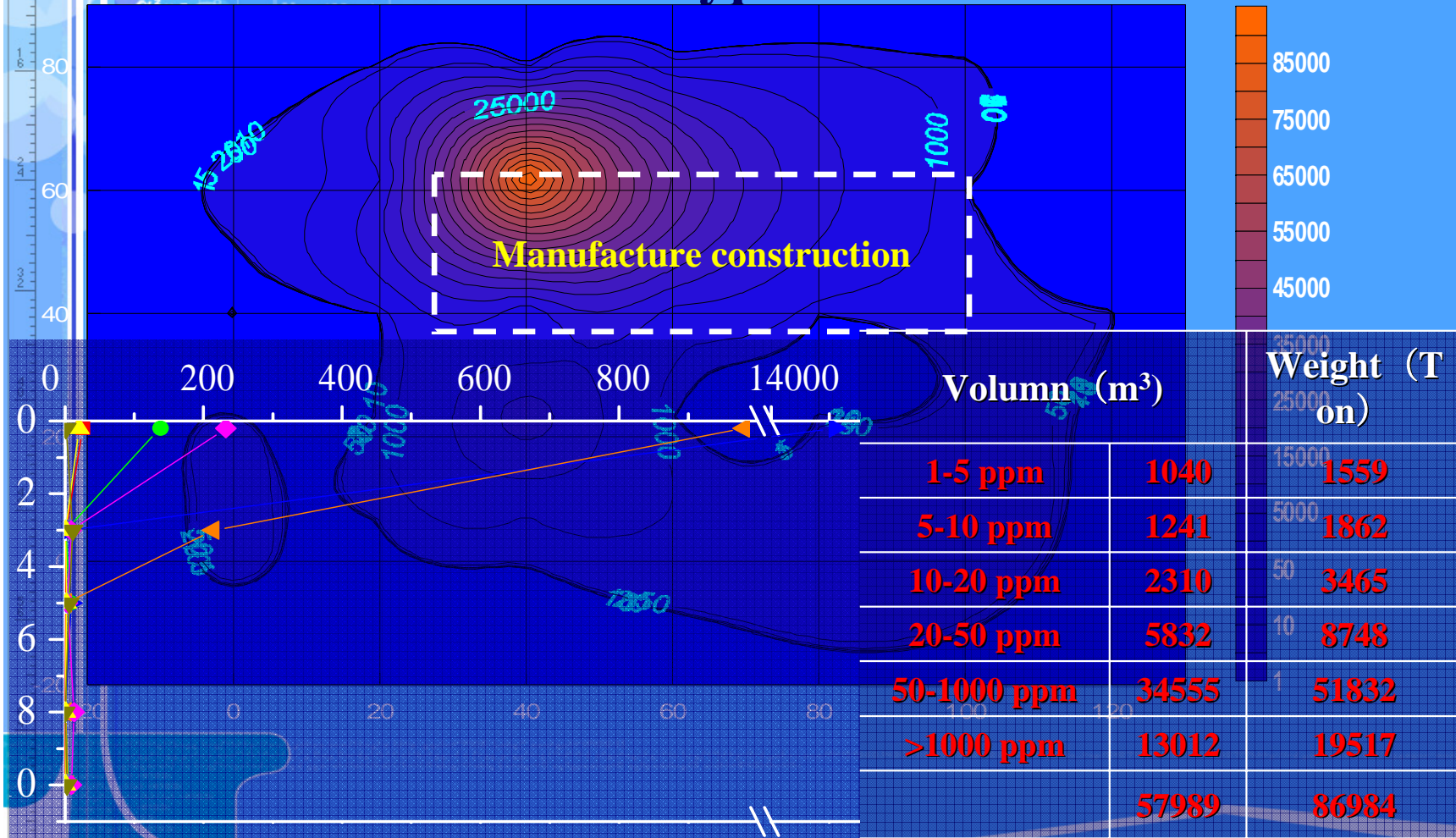
90,000 t soil > 50 ppm

➤ 2 HCB and chlordane m  
anufacturers

20,000 t soil > 50 ppm



# An Evaluation in a Typical DDT Manufacturer



# Pesticide POPs Contaminated Sites in the Distribution Area

- ◆ **Pesticide POPs contaminated sites include:**
  - **Warehouses of middle distributors (such as former agricultural trade companies)**
  - **Manufacturers that produce dicofol and antifouling paints with DDT in non-closed systems.**
- ◆ **Primary investigation has been conducted into some of those pesticide POPs contaminated sites. The volume of contaminated soil has not been confirmed**



## NIP Specific objectives on pesticide POPs

- **For production, use, import and export of pesticide POPs:**
  1. Prohibit of HCB by 2008;
  2. Basically eliminate Chlordane and Mirex by 2009;
  3. Make an effort to phase out the production and use of DDT by 2009; Eliminate, gradually, the production and use of DDT as intermediate in closed-system
  4. Prohibit the import and export of DDT for any purpose by 2009.
- **For POPs stockpiles and wastes:**
  1. Establish a preliminary system for POPs stockpiles & wastes management by 2010;
  2. Complete the management and disposal of 30% of pesticide POPs wastes by 2010;
  3. Complete the rest 70% by 2015
- **For POPs contaminated sites:**
  1. Establish an inventory of pesticide POPs contaminated sites by 2015.
  2. Establish management, eventual land use, environmental remediation, etc., for POPs contaminated sites by 2015.
  3. Improve the lists of POPs wastes and POPs contaminated sites and gradually eliminate contamination caused by them.

## Main Problems in Current Management System

### ◆ No specific regulation and requirement for contaminated sites

- Only general regulation in *Solid Waste Law, Management Quality Standards for soils, Measurements on Safety Management of Hazardous Chemicals, Measures on Environmental Pollution Control of disposed Hazardous Chemicals*
- No standard to differentiate the solid wastes and contaminated sites
- Lack of environmental risk assessment of contaminated sites
- No specific principles on how to share the treatment costs of the historical contaminated sites

### ◆ Lack of Standards

- Only a *Environmental Quality Standard for Soils at present*, issued in 1995 and never revised; the standard is not cover all Index related to contaminated soils, e.g. no index for DDT contaminated soils

## Requirement to Access NIP Objects

- **Develop identification criteria for POPs wastes**
- **Identify pesticide POPs stockpiles and wastes and improve the ongoing database system establishment**
- **Establish the technical codes system for the environmentally sound management and disposal of POPs wastes**
- **Formulate identification standards for POPs contaminated sites appropriate to the national conditions of China**
- **Develop a long-term action plan for the environmentally sound remediation of POPs contaminated sites**

## What Has Been Done?

- Pesticide pops are listed in category 4 ( in revised *National List Of Hazardous Wastes* published in 2008.)
- All listed pesticide POPs with concentration  $\geq 50$  mg /kg will be identified as hazardous waste (*Hazardous waste identify criterion: hazardous material concentration GB 5085.6— 2007* );

# Ongoing Works

- **Field investigation**

- Identified pesticide POPs stockpiles and wastes to improve the existing preliminary inventories(3 typical provinces)

- **Environmental sound deposal technology**

- Carry out demonstration project to Assess cement kiln technologies on POPs waste disposal, building treatment criterion and technical specification on co-processing of hazardous wastes in cement kilns

- **Investigation at 40 undetected contaminated sites (production field)**

- Primary sampling has been done in 2007, investigation in depth is planning.

- **Research on contaminated site remediation**



# Contaminated Sites Investigation (historical pesticide chemical producing enterprises)



## Develop environmentally sound management and disposal of obsolete POPs pesticides and POPs wastes

- **Updating inventory data of Obsolete POPs Pesticide (OPP)**
  - establishment of archives for all the sites, including type, nature, magnitude and geographic dispersion of obsolete POPs pesticide, site photo
- **Study on policy demand for OPP Environmental Sound Management (ESM) and disposal, include:**
  - mechanism to ensure the project implementation, assessment the existing policy and legislations with regards to the general management and disposal of pesticide
- **Necessity and feasibility study on unified national wide disposal of OPP**



# Investigation for waste quantity and category in pesticide chemical distribution enterprises



**Checking the record**



**Field investigation**

## Near Future Planning

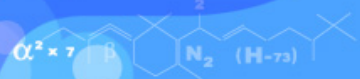
- ◆ National wide field investigation on contaminated sites in distribution area.
- ◆ Carry out risk assessment method to establish correlative standard, such as:

*Standard for Contaminated Sites Identification, Measures on Environmental Management for Contaminated Sites, Standard for Contaminated Sites remediation*

- ◆ Try to develop  
*Technical Guideline For Contaminated Site Remediation*



$$\frac{c}{d} = 3.7248$$



*Thank you  
for your attention*

huangzc@craes.org.cn

