

Health Consultation

A Review of Clean Up Levels

SUIRE SITE

KAPLAN, VERMILLION PARISH, LOUISIANA

EPA FACILITY ID: LA0002335545

OCTOBER 25, 2004

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

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Prepared by:

Louisiana Department of Public Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

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Statement of Issues and Findings

The Agency for Toxic Substances and Disease Registry (ATSDR) was asked by the Environmental Protection Agency (EPA) Region VI to comment on proposed pesticide cleanup levels for the Suire site. As a partner in ATSDR's Cooperative Agreement, the Louisiana Department of Health and Hospitals (LDHH)/Office of Public Health (OPH)/Section of Environmental Epidemiology and Toxicology (SEET) was asked to perform this health consultation. On-site soil sampling found levels of aldrin and dieldrin contamination. ATSDR and OPH/SEET do not set cleanup levels for a contaminated site; however, given site-specific information, we will comment if we believe a proposed site-specific cleanup level would be protective of public health. This decision is specific for the Suire site and is not applicable to other sites. EPA Region VI specifically requested:

- Would an on-site soil clean up level of 11 milligrams per kilogram (mg/kg) of aldrin be protective of public health?
- Would an on-site soil clean up level of 7.9 mg/kg of dieldrin be protective of public health?

OPH/SEET and ATSDR believe that both levels would adequately protect public health from on-site soils contaminated with the pesticides.

Background

The Suire site is a former rice seed storage and treatment facility located at 313 East Mill Street, approximately 400 feet east of Louisiana Highway (LA Hwy) 35 in Kaplan, Vermilion Parish, Louisiana [1]. The Alexandria Seed Company operated on the Suire property from 1962 until 1986. The property was used to store rice seed and agricultural equipment. Louisiana Department of Agriculture and Forestry (LDAF) records indicated that in 1972, the Alexandria Seed Company either treated the rice seed with aldrin or accepted previously treated seed. The rice was stored in the warehouse and, for an unknown reason not used. EPA banned aldrin use as a rice treatment on May 27, 1975. The Alexandria Seed Company filed for bankruptcy in August 1986 and forfeited the property.

The site consists of two tracts of land owned by Andrew Suire. The first tract is approximately 175 feet by 165 feet in size and designated as Suire I. The second tract is located to the southeast of Suire I and is approximately 310 feet by 180 feet in size. The second tract is designated Suire II.

Pesticides (aldrin and dieldrin) are the primary contaminants of concern identified at the site. Aldrin and dieldrin are synthetic chemicals that are no longer in use; aldrin readily changes into dieldrin upon entering the body. The pesticides on-site are attributed to the degrading rice seed piles.

Based on a request by the LDAF in 1998, EPA agreed to conduct further assessment activities at the Suire site to determine if the pesticide concentrations had increased or decreased due to degradation of the rice seed or off-site migration.

Analytical results are from soil samples that were taken from on-site areas below the rice piles. Concentrations of the pesticides ranged from 2.1 parts per million (ppm) to 2,900 ppm. Site

features are composed of two land tracks designated as Suire I and Suire II. The Suire I area of the site includes the following:

- three degraded rice seed piles (RP1, RP2, and RP3),
- a metal shed,
- an empty metal tank,
- a concrete pad, and
- miscellaneous building debris.

In this tract the rice seed has decomposed with age and exposure, and currently there are two piles located at the site (the other pile is indistinguishable from the surrounding landscape). The rice piles are located within several brick footings that appear to coincide with the location of the former warehouse. The footings also mark a rise in elevation from the interior and exterior land levels, thus forming a depression within the former warehouse area.

The metal shed measures approximately 60 feet by 30 feet in size and is located on the south east side of the property. The metal tank measures approximately 3 feet by 12 feet in size and is located to the north of the metal shed. Suire I was overgrown and covered with debris during the site visit in summer 1998.

Suire I is bounded to the north by a former Southern Pacific Railroad (currently the Union Pacific Railroad (UPRR)) spur line. An undeveloped grass lot is located north of the former spur. East Mill Street forms the southern boundary of the site. A municipal ditch, approximately 3 feet in depth, flows along East Mill Street. A residential area is located to the south of East Mill Street and is within 50 feet of the site. A warehouse owned by Hardee Lumber, is located on the UPRR property, and borders Suire I to the west. Frederick Avenue forms the eastern boundary of Suire I, separating it from Suire II. The drainage pathway off site is visible originating from the southern region of the Suire property, near East Mill Street and flowing into the municipal drainage ditch. According to city of Kaplan representatives, the drainage flow in the ditch along the southern border of the site may run east-west or west-east based upon when the ditch is cleaned by the city of Kaplan. During the June 1998, sampling mission, a brief shower indicated drainage flow within the ditches ran from east to west at that time.

The Suire II area of the site includes the following:

- a concrete pad,
- a flatbed truck trailer, and two unoccupied mobile homes.

The concrete pad is located at the western end of the property and measures approximately 130 feet by 75 feet in size. The two mobile homes are located at the southern end of the property. A municipal drainage ditch flows along the southern and western sides of the property. Suire II is bounded by Frederick Avenue to the west, the UPRR-owned land to the north, East Mill Street to the south, and a trailer park to the east. Local residences and businesses receive their drinking water from the city water supply, which is obtained from the Chicot Aquifer, approximately 280 feet deep.

The entire Suire Site is unsecured and accessible from all directions. Conditions at the site have not changed since EPA's site visit in 1998 (Telecommunications with EPA Region VI, July 6, 2004).

The industrial nature of this site and the current site conditions make it unappealing to children that might trespass onto the site. A child weighing 10kg would be approximately five years of age, and therefore not likely to have access to the site. The likelihood of child of this weight and/or age playing of this site would be minimal.

Is a soil clean-up level of 11 mg/kg of aldrin in on-site soils protective of public health?

Yes. Assuming a 10 kilogram (kg) child is exposed to on-site soils at the 11 mg/kg level, that child would be expected to absorb no more than (exposure factors from ATSDR Public Health Guidance Manual) [2]:

$$\frac{11 \text{ mg Aldrin}}{\text{kg soil}} \times \frac{200 \text{ mg soil}}{\text{day}} \times \frac{1 \text{ kg soil}}{1,000,000 \text{ mg soil}} \times \frac{1 \text{ child}}{10 \text{ kg}} = 0.00022 \text{ mg Aldrin/kg/day.}$$

ATSDR's acute Minimum Risk Level for aldrin is 0.002 milligrams per kilogram per day (mg/kg/day) [3]. A minimum risk level (MRL) is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancerous health effects over a specified exposure period.

ATSDR uses the no-observed-adverse-effect-level/uncertainty factor (NOAEL/UF) approach to derive MRLs for hazardous substances. MRLs are set below levels that, based on current information, might cause health effects in persons most sensitive to such substance-induced effects. In addition, ATSDR derives MRLs for three levels of exposure duration—acute (1–14 days), intermediate (greater than or equal to 14–364 days), and chronic (greater than or equal to 365 days) exposure—and for the oral and inhalation exposure routes. MRLs are generally based on the most sensitive substance-induced end point considered relevant to humans. ATSDR does not use serious health effects (such as birth defects or irreparable damage to the liver or kidneys) as a basis for establishing MRLs. Therefore, exposure to a level above the MRL does not mean that adverse health effects will necessarily occur.

Scenarios for acute and chronic exposure durations were used to estimate doses, as the site is unrestricted and residential areas are located to the south and east of the site. Both exposure scenarios were evaluated for a child to show conservative dose estimates.

A daily dose of 0.00022 mg/kg/day of aldrin is ten (10) times below the ATSDR Acute Oral Minimum Risk Level (MRL). A child would have to ingest 2000 milligrams of contaminated soil per day to receive a dose equal to the ATSDR MRL. The lowest dose of aldrin known to cause non-serious health effects in either animals or humans is a further 1000 times greater than ATSDR's MRL [3]. This MRL was based on a LOAEL 2 mg/kg/day (only dose tested) for significant fetal malformations or neurological effects. It is based on a study of mice and hamsters where an increased dose caused webbing in the feet on the offspring. [3]. A chronic exposure scenario for a child was also evaluated for this site. A daily dose of 0.000013 mg/kg/day was calculated for a 35 kg child ingesting 200 mg of soil a day and visiting the site 3 days a week for a year. This dose is below the ATSDR Chronic Oral MRL of 0.00003 mg/kg/day.

Is a soil clean-up level of 7.8 mg/kg of dieldrin in on-site soils protective of public health?

Yes. Assuming a similar exposure scenario as above (a 10 kg child ingesting 200 mg of soil per day), soil contaminated with 7.8 mg/kg of dieldrin would ingest no more than:

$$\frac{7.8 \text{ mg Dieldrin}}{\text{kg soil}} \times \frac{200 \text{ mg soil}}{\text{day}} \times \frac{1 \text{ kg soil}}{1,000,000 \text{ mg soil}} \times \frac{1 \text{ child}}{10 \text{ kg}} = 0.00016 \text{ mg Dieldrin/kg/day}$$

ATSDR's intermediate Minimum Risk Level for aldrin is 0.0001 mg dieldrin/kg/day (No acute MRL exists for dieldrin) [3]. A minimum risk level (MRL) is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancerous health effects over a specified exposure period.

Scenarios for acute/intermediate and chronic exposure durations were used to estimate doses, as the site is unrestricted and residential areas are located to the south and east of the site. Both exposure scenarios were evaluated for a child to show the most conservative dose estimates.

A daily dose of 0.00016 mg/kg/day of dieldrin is roughly equivalent to the ATSDR Intermediate Minimum Risk Level. A child would have to ingest 200 milligrams of contaminated soil per day to receive a dose equal to the ATSDR MRL. The lowest dose of dieldrin known to cause non-serious health effects in either animals or humans is a further 1000 times greater than ATSDR's MRL [3]. This MRL was based on a LOAEL 1 mg/kg/day (only dose tested) for significant neurotoxic effects in rats [3]. A chronic exposure scenario for a child was also evaluated for this site. A daily dose of 0.0000093 mg/kg/day was calculated for a 35 kg child ingesting 200 mg of soil a day and visiting the site 3 days a week for a year. This dose is below the ATSDR Chronic Oral MRL of 0.00005 mg/kg/day.

Calculation of Carcinogenic Risk

In addition to acute risks assessed for applicable contaminants, the cancer risk was also estimated for aldrin and dieldrin. The EPA's range of acceptable cancer risk levels is from 1 excess cancer per 10,000 people to 1 excess cancer per 1,000,000 people exposed for a lifetime (1×10^{-4} – 1×10^{-6}).

The estimated risk of developing cancer resulting from exposure to the contaminants within the sediment was calculated by multiplying the exposure dose over a 70-year (lifetime) period by the EPA's cancer slope factor of 17 mg aldrin/kg/day and 16 mg dieldrin/kg/day. The results predict an upper bound estimate of the increase in the theoretical risk of developing cancer after exposure to the contaminant. If residents were exposed to aldrin and dieldrin at the above calculated doses for a lifetime (70 years) there would be an unacceptable cancer risk. However, current site conditions, that have been existing since approximately 1986, will be remediated in the near future, therefore eliminating the potential for a lifetime exposure. It is not likely that exposure to these chemicals at this site would result in excess cancer incidence.

Assumptions and Limitations

The assumptions and limitations of this health consultation include:

- Other potential exposure pathways, such as biologic accumulation of aldrin and dieldrin, have not been considered;

- This health consultation is based on-site specific information conveyed to ATSDR by EPA officials. Therefore, our conclusions regarding the site-specific cleanup levels are limited to this site only; and,
- Given the many buildings and intricacies of the site (including the concrete pads, buildings, etc.) physical hazards may exist as the site is unsecured.

Child Health Considerations

ATSDR recognizes that the unique vulnerabilities of infants and children demand special emphasis in communities concerned about contamination. Children are at greater risk than are adults from certain kinds of exposures to hazardous substances released into their environment. Children may be more likely to be exposed to outdoor air contaminants when playing outdoors. Because children are smaller than adults are, exposure may result in a higher dose per body weight. In addition, children's developing body systems can sustain damage if toxic exposures occur during critical growth stages.

Consequently, OPH/SEET and ATSDR evaluated the data to assess the potential health effects of aldrin and dieldrin on children in the community. OPH/SEET and ATSDR found that the proposed cleanup levels would be protective to children.

Because site conditions are unsecured and access to the site is unrestricted, children and others might be exposed to physical hazards (confined spaces and storage containers of chemicals) if they visit the site.

Conclusions

- Given current conditions and the non-residential use of the site, a cleanup level of 11 mg/kg aldrin and 7.8 mg/kg dieldrin in on-site soils is protective and represents no public health hazard.
- On-site conditions (physical hazards) could represent a public health hazard to community members, especially children, who may trespass onto the site.

Recommendations

- OPH SEET recommends that the site be evaluated for the presence of physical hazards. If physical hazards are present, and removal/remedial activities are not imminent, alternatives should be considered.

Public Health Action Plan

The Public Health Action Plan for the site contains a description of actions that have been or will be taken by ATSDR or other government agencies at the site, individually or in combination. The purpose of the Public Health Action Plan is to ensure that this public health consultation not only identifies public health hazards, but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. Included is a commitment on the part of ATSDR to follow up on this plan to ensure its implementation.

Actions Planned:

- OPH/SEET and ATSDR have agreed to assist EPA in evaluating any additional data for potential public health implications for this site.
- In the event that the site is utilized for residential use or a use that would allow regular access to the site, levels of aldrin and dieldrin should be reevaluated.

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2. Agency for Toxic Substances and Disease Registry, Public Health Assessment Guidance Manual, Atlanta, United States Department of Health and Human Services; 1992.
3. Agency for Toxic Substances and Disease Registry, Toxicological Profile for Aldrin/Dieldrin, Atlanta, United States Department of Health and Human Services; September 2002.

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Certification

This Suire site Health Consultation was prepared by the Louisiana Department of Health and Hospitals under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time this health consult was begun.

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The Division of Health Assessment and Consultation, ATSDR has reviewed this health consultation and concurs with the findings.

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