

**HEALTH CONSULTATION**

**Southern Shipbuilding Corporation**

**Slidell, Louisiana**

**April 23, 1997**

**prepared by**

**Agency for Toxic Substances and Disease Registry  
and the Louisiana Office of Public Health**



## **BACKGROUND AND STATEMENT OF ISSUES**

The Environmental Protection Agency (EPA) Region VI and the Louisiana Department of Environmental Quality (LDEQ) have presented the Proposed Final Plan for addressing the contamination at the Southern Shipbuilding Corporation Site, Slidell, Louisiana. The final plan recommends that no further action be taken to address the contamination at the site.

The site consists of 2 operable units: Operable Unit 1 (OU1) and Operable Unit 2 (OU2). OU1 consists of 10.9 acres of the site. The waste in OU1 consisted of oily waste pit material which has been incinerated. The ash was back filled into on-site pits capped by a clay layer. The largest landmass of the site is OU2. Soil removal has occurred to address contamination at this area of the site. OU2 was remediated to levels of contamination that are acceptable for future light industrial use.

EPA has determined that the future use of the land may be residential based on current land use in the area. Since the action levels for the removal action were derived for use of the land as light industrial, the citizen group "Slidell Working Against Major Pollution" (SWAMP) has requested that the Agency for Toxic Substances and Disease Registry (ATSDR) review the action levels proposed for OU2 and determine if these actions levels are protective if the future use of the property is residential. Furthermore, SWAMP has requested that ATSDR review the post remediation data of OU2 and determine if the remaining soil contaminants on-site would pose a risk to future residents.

EPA Region VI has requested that ATSDR review the proposed plan for the site to determine if the actions proposed for residential use of the property are protective of future residents.

In order to address these concerns, ATSDR and the Louisiana Office of Public Health (LOPH) have reviewed the data in EPA's Removal Assessment and Removal Support Reports (1,2). Since that time, the health agencies were informed that asbestos fibers are present in the surface soil in sections of OU2. However, no sampling results or other data showing the extent or concentration of the asbestos have been made available to ATSDR or LOPH at this time. Therefore, ATSDR and LOPH will address the health issues as they relate to the asbestos in a future health consultation.

## **DISCUSSION**

The contaminants of concern for the Southern Shipbuilding Site are polycyclic aromatic hydrocarbons (i.e. benzo(a)pyrene), polychlorinated biphenyls (PCBs), lead and arsenic. Removal action levels were established for OU2 for the soil removal (Table 1). ATSDR was asked to comment if these removal action levels would be protective of the health of future residents if the property use was rezoned to residential use.

Table 1. Contaminants of Concern and Removal Action Levels OU2	
Contaminants of Concern	Removal Action Levels (mg/kg)
B(a)P [Benzo(a)pyrene]	10
Total PCBs	10
Lead	2,000
Arsenic	30
[mg/kg = milligrams per kilogram]	

The removal action level for benzo(a)pyrene equivalents [B(a)P] was 10 mg/kg. If the maximum level of B(a)P in the soil were 10 mg/kg, it is not expected that noncancer health effects would be produced in an adult or child that may incidentally ingest the soil. B(a)Ps can be absorbed through the skin especially from oily contaminated soils (3). Because it is not possible to determine the amount of B(a)P absorbed through the skin, it is not possible to determine the health effects from this exposure.

B(a)P have been shown to produce cancers in animals and has been classified as a probable human carcinogen (3). The incidental ingestion of the soil containing 10 mg/kg B(a)P equivalents for a lifetime, would result in a slight increased risk for cancer for residents. Therefore, ATSDR and LOPH do not concur with this action removal level of 10 mg/kg for B(a)P in the soil if the property use is residential without the addition of clean fill or other corrective actions stated in the Proposed Final Plan.

#### *Total PCBs*

The removal action level of total PCBs is 10 mg/kg. The exposure resulting from incidental ingestion of 10 mg/kg PCBs in soil by an adult or an older child is below the minimal risk level (MRL) established by ATSDR (4). The minimal risk level is an estimate of daily human exposure that is below a level which expected to result in noncancer health effects. For a pica child, the estimated exposure from ingestion of the soil exceeds the MRL. The estimated level of exposure for a pica child may be of health concern. PCBs have caused immunological changes in some animal studies (4).

In animal and occupational exposure studies, it has been shown that PCBs can be absorbed through the skin of animals and humans (4). Since the information from these studies is so limited, it is not possible to determine the amount of PCBs absorbed through the skin, therefore it is not possible to determine the health effects, if any, that may occur from this exposure.

PCBs have been shown to produce cancer in animals and have been classified as probable human carcinogens. There is no significant increase in cancer risk expected to occur from exposure to 10

mg/kg PCBs in soil. However, since the MRL is exceeded for the pica child, ATSDR and LOPH do not concur with this action removal level for PCBs, if the property use is residential without the addition of clean fill or other corrective actions stated in the Proposed Final Plan.

### *Lead*

The action level established for lead was 2000 mg/kg. This value exceeds the EPA soil screening level of 400 mg/kg. The EPA SSL is a chemical concentration in soil which represents a level of contamination above which there is sufficient concern to warrant further site specific studies.

Additionally, if the property is rezoned for residential use, there maybe small children that come in contact with the soil. Small children are extremely vulnerable to the effects of lead, since their hand-to-mouth activities during play tend to increase the amount of soil they may incidentally ingest. Once the lead contaminated soil is ingested, children absorb more of the lead through their gastrointestinal tract than adults. The developing nervous system is extremely sensitive to the effects of lead. Decreases in intellectual performance have been demonstrated in children with lead exposure (5). Therefore, ATSDR and LOPH do not concur with this action level for lead in the soil for future residential use of the property without the addition of clean fill or other corrective actions stated in the Proposed Final Plan.

### *Arsenic*

The removal action level for arsenic in soil was 30 mg/kg. At this concentration, noncancer health effects are not expected to occur in children or adults from incidental ingestion of the soil. Dermal contact with the soil is not expected to produce noncancer health effects in the child or adult (6).

Arsenic is a known human carcinogen (6). At the action level for arsenic (30 mg/kg), there is no significant risk for increased cancers in future residents. ATSDR and LOPH concur with the action level of 30 mg/kg for arsenic in the soil if the land use was residential.

## **POST REMEDIATION CONTAMINATION-OU2**

The concentrations of contaminants remaining in soils at OU2 after the completion of the removal actions are presented in Table 2 (1,2). The concentrations of arsenic, PAHs, PCBs, and lead remaining after the removal actions are below the remedial action levels designated for OU2 for light industrial use.

Table 2. Southern Shipbuilding Corporation Superfund site. Locations of areas excavated on OU2 and the level of contaminants remaining after excavation.\*

Node Location	Contaminant of Concern	Remaining level (ppm)	Depth of remaining level (feet)
2D23	B(a)P	9.98	1.0
X127A	B(a)P	0.39	1.0
X130	B(a)P	6.99	1.0
X180	B(a)P	none	2.0
X200	B(a)P	4.97	1.0
2A24	lead, PCBs	none	2.0
2C21	B(a)P, lead	none	2.0
2C22	lead, B(a)P	1800, 3.25	0.5
2D06	arsenic	5.8	1.0
2D09	arsenic, PCBs	13.0, 8.3	1.0
X047	B(a)P	none	2.0
X162	PCBs	none	2.0
X163	arsenic, B(a)P	none	2.0
X175	PCBs	0.25	1.0
X186	arsenic, PCBs	3.4, 9.3	0.5
X187	arsenic, PCBs	5.2, 8.1	0.5
X191	arsenic, PCBs	24.9, 9.7	0.5
X193	arsenic, lead, PCBs	12.9, 134, 8.8	1.0
X197	PCBs	9.05	1.0
X198	arsenic, PCBs	none	2.0

\* Removal Support (EPA) Report, Part 2-Operable Unit 2, December 3, 1996.

In order to determine if the concentrations of contaminants remaining could result in potential health effects (noncancer and cancer) for future residents, it was assumed that an a future resident could be exposed to the soil contaminants by ingestion or dermal contact year round. The most sensitive individual that might come in contact with the contaminated soil is a child exhibiting pica behavior (e.g. a child 1-3 years of age with a soil ingestion rate of 5000 mg of soil per day). Exposure scenarios for older children (3-10 years of age, soil ingestion rate, 200 mg per day) and adults (soil ingestion rate, 100 mg of soil per day) were evaluated. The estimates of exposure were based on the maximum concentrations of site contaminants after the removal actions had occurred.

#### *B(a)P*

The maximum B(a)P equivalent concentration remaining in the soil was 9.98 mg/kg at 1 foot depth. It is not known if this is the concentration of B(a)P found in the surface soil. Assuming the same concentration is maintained at the surface, noncancer health effects are not expected to occur from ingestion of the soil. It is not possible to determine if dermal exposure to the contaminated soil would pose a health risk, since we do not know the amount of B(a)Ps absorbed through the skin.

For a long term resident, there maybe a slight increased risk for cancer from ingestion of the soil, if the maximum level of 9.98 mg/kg B(a)Ps are found consistently in their yards.

#### *PCBs*

The maximum level of PCBs found in the soil was 9.7 mg/kg at a depth of 0.5 feet. This level of PCBs is not expected to result in noncancer health effects for adults or older children incidentally ingesting the soil. For a pica child, the MRL is exceeded and these exposures may pose a health concern. Because the amount of PCBs absorbed through the skin is unknown, it is not possible to determine if health effects would result from this exposure.

There would be no significant increase in cancer risk for residents from incidental ingestion of the soil, if this level of PCBs is consistently found in the soil of their yards.

#### *Lead*

At least one sample had a lead concentration (1800 mg/kg) greater than the EPA Soil Screening Level of 400 ppm. This concentration of lead in soil would be of concern for a young child that may ingest the soil while playing in the yard. There is a possibility of increased blood levels from this exposure.

#### *Arsenic*

The maximum concentration of arsenic remaining in the soil was 24.9 mg/kg. Most of the remaining arsenic samples contained arsenic concentrations less than the site background of 13.0 mg/kg. The concentration of arsenic found in the soil after the removal action do not pose a

noncancer or cancer risk to future residents of the site.

### **Future Institutional Controls**

In order for EPA to select a No Further Action alternative for the site, it is necessary for the private party developing the property be placed on notice that additional measures would have to be undertaken to ensure that the property was safe for all future residents. EPA Region VI has stated that the residential development of the OU1 unit should be discouraged because marginally contaminated soils and incinerator ash are present beneath an engineered clay cap. Future construction such as placement of utilities, pipes, or slabs may breach the cap and result in contact of workers or future residents in contact with the marginally contaminated soils. If the ash or contaminated soils are excavated below the capped area, EPA recommends that the soils be sampled and be redeposited within a former pit area or disposed off-site in an approved landfill if they are contaminated. If a capped pit is disturbed then the cap must be restored to its original condition.

OU2 has had extensive soil removal. There are some areas in OU2 that would contain contaminants above EPA's health-based cleanup standards for residential property. EPA has recommended that if future residential development of OU2 should occur that the addition of 2 feet of clean fill should be required. Furthermore, any additional structure elevation needed to bring the foundations of buildings above the 100 year flood plain could be accomplished by using elevated structures.

The described measures for OU1 and OU2 would require that the City of Slidell prescribe some alternate form of zoning for these requirements (capping or removal of soils) in conjunction with filing of deed notices. It is not known at this time if rezoning or deed restrictions will be implemented for the Southern Shipbuilding Site by the City of Slidell if the use of the property is changed to residential.

ATSDR and LOPH concur that the rezoning of OU1 to residential should be discouraged since this may involve the displacement of the contaminated materials remaining under the clay cap. The addition of 2 feet of clean fill over OU2 would protect residents from exposure to site related contaminants. First, the fill would create a barrier for the residual contamination. Second, if a resident should disturb the fill by planting or digging in their yards, there would be mixing of the residual contamination with the clean fill that would further reduce the levels of the residual contaminants that a resident may come in contact with. The institutional controls or other measures should be implemented prior to the occupancy of the site by residents.



## **CONCLUSIONS**

Based on the data reviewed, ATSDR and LOPH have concluded the following:

- 1) The action levels proposed for B(a)P equivalents, PCBs, and lead for the remediation of the site for light industrial use are not protective of the health of future residents if the property is rezoned for residential use without corrective measures.
- 2) There are some areas of site contamination remaining in OU2 that without further site remediation would pose a health risk to future residents of the site.
- 3) The requirements contained in the Proposed Final Plan for the Southern Shipbuilding Site for the future residential development of the site including additional soil removals, maintenance of the clay cap, and the addition and maintenance of 2 feet of clean fill over the residual contamination would protect the health of future residents.

## **RECOMMENDATIONS**

- 1) ATSDR and LOPH recommend that the property not be developed for residential use unless institutional controls for the property are implemented.
- 2) Additional soil samples should be obtained from the limits of evacuation from previous removals on OU2 to better define the residual contamination.
- 3) ATSDR and LOPH should work with the City of Slidell to ensure that measures are undertaken that will protect the health of future residents, if the site is developed for residential use.

## REFERENCES

1. Removal Assessment Report for Southern Shipbuilding Corporation Site, Slidell, St. Tammany Parish, Louisiana. Ecology and Environment, Inc. December 16, 1996.
2. Removal Support (EPA) Report, Part 2-Operable Unit 2, Southern Shipbuilding Corporation, Slidell, St. Tammany Parish, Louisiana, Ecology and Environment, Inc., December 3, 1996.
3. Agency for Toxic Substances and Disease Registry. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta: U.S. Department of Health and Human Services, Public Health Service, 1993.
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5. Agency for Toxic Substances and Disease Registry. Toxicological profile for lead. Atlanta: U.S. Department of Health and Human Services, Public Health Service, 1993.
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