

2.0 PRESENTATION OF THE CASE STUDY

As the National Focal Point for the POPs project in Malaysia, the Ministry of Natural Resources and Environment (NRE), in consultation with key stakeholders, selected the Air Hitam Sanitary Landfill (AHSL) site in the State of Selangor for the POPs Human Health Risk Assessment (HHRA) case study for the POPs project.

The AHSL was built in 1995 and closed in December 2006, covering an area of 42 hectares. It was the first engineered sanitary landfill site in Malaysia. The Selangor State Government Council approved the Worldwide Sita Environmental Management (later known as the Worldwide Landfills Sdn Bhd (WLSB)) to develop a sanitary landfill in Selangor. WLSB obtained a concession contract for 20 years which included a 5 year landfill closure maintenance plan. The site consists of 7 landfill phases with a base at 35 m above mean sea level (amsl) and its highest point at 81 m amsl after capping. It is equipped with a heavy duty geotextile liner, a ground water drainage system, and a leachate collection system and treatment ponds.

During the operational period of AHSL (11 years), the AHSL received a total of approximately 6.2 million tons of domestic waste (Worldwide Landfills, 2007). Between 1,200 and 3,000 tons/day of domestic waste was deposited in the site between 1995 and 2006 with waste collected from four Selangor municipalities (Ampang Jaya, Subang, Petaling Jaya and Shah Alam), Kuala Lumpur and Putrajaya.

Due to the lack of POPs data from the site, it is a challenge to specify if, and what, POPs may be present in the AHSL. The sanitary landfill was designated for disposing non-scheduled waste, including: domestic/household waste, commercial and light industrial waste, market waste, street cleaning waste, construction waste and food waste.

POPs pesticides might be present in AHSL, since several POPs pesticides were historically registered in Malaysia (e.g., DDT was registered for 19 years in the country). Some domestic waste might also contain PCBs and other POPs-like contaminants. Because the site is a landfill, a wide variety of POPs contaminants may also be associated with the site. PCBs, PCDD/Fs (i.e., dioxins/furans) and chlorinated pesticides were targeted for screening. For both soils and sediments the maximum CALUX TEQ concentrations were low at only 13 pg TEQ/g for PCDD/Fs, and 2.8 pg TEQ/g for dioxin-like PCBs. Maximum concentrations were derived from material collected from the treatment pond. Credible fish sample analysis and other potential toxic data were not available for a more detailed risk assessment.

The risk assessment conducted as part of the POPs Project identified several categories of receptors (i.e., population potentially exposed to contamination), including approximately 7,250 people living in 1,500 housing units in 3 main residential areas around the site. Site workers and security personnel working

permanently at the site are primary potential receptors. A public health and socio-economic survey conducted by the National Consultant (Mazrura, 2009) revealed that some of the nearby residents (2.7% of the total respondents) may be involved directly in activities that could increase their exposure to contaminants present at the site. A detailed description of the site surroundings and operations, as well as key results of the site risk assessment, is provided in Appendix A1.

As part of the risk assessment conducted for the AHSL site, various measures aimed at efficiently managing and reducing the POPs hazard were identified. These measures were developed with stakeholder inputs gathered at the National Training Workshop in Putrajaya, Malaysia in January 2009 (Hatfield, 2009b) and have been grouped into 2 scenarios as presented in Appendix A1. The national participants also agreed that the potential risk management measures must be considered within the context of the existing Landfill Closure and Post Closure Maintenance Plan (LCPCMP) (January 2007 - December 2011). They decided that before risk management options are considered, additional risk assessment is recommended to determine if there are any human health risks at the site from potential POPs and other hazardous chemical contaminants.

Two risk management objectives have been identified: develop a detailed assessment of possible human health risks from POPs and other toxic chemicals; and implementation and monitoring of a Health and Safety Plan. It should be noted that a detailed assessment of possible human health risks (Scenario 1) is the short-term priority and a pre-condition for implementing the longer-term more costly option: Scenario 2. **Scenario 2 will be implemented in addition to those measures proposed by WLSB under the 2007-2011 LCPCMP.** Furthermore, it must be noted that the measures of Scenario 1 are included in Scenario 2 as an environmental and human health monitoring component.

An outline of the risk management scenarios has been provided in Appendix A1; detailed feasibility studies are needed to define in detail the nature and extent of the measures to be implemented, especially with regard to the containment and remediation scenarios.