

Report
Chemical Investigation of Soil for Pesticides

at

The WHIM

Old Harbour, St. Catherine, Jamaica



submitted to:

West Indies Home Contractors Limited

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Purpose

This work was conducted to investigate the presence of pesticide residues in the soil at the WHIM, Old Harbour, St. Catherine.

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Executive Summary

This document presents the findings of a chemical investigation of the soil for pesticides at the WHIM, Old Harbour, St. Catherine. Samples were collected using internationally accepted procedures and the analysis of these samples using the USEPA Pesticide Residue Analytical Methods revealed an absence of pesticide residues, metabolites and degradates at the location.

I. Background and Site Description

West Indies Home Contractors Limited (WIHCON) is currently in the process of developing lands known as The WHIM, in Old Harbour St. Catherine, Jamaica. The WHIM (N17.6° W77.1°) is located off the southern exit ramp of Highway 2000 toll road and west of the Old Harbour Bay main road. This land is approximately 110 hectares and WIHCON is proposing to develop the land for middle income housing. As the WHIM is located on lands which were formerly used as sugar cane fields, there is a need to investigate the presence of residual pesticides in the soil. In order to determine whether pesticide residues were present, WIHCON commissioned the consultant to conduct a chemical analysis of the soil for pesticides at the WHIM.

Information from the Ministry of Agriculture indicates that the WHIM is underlain with Lodge Clay Loam, mainly silty clays and sands. Based on reports, the land has not been used for farming for approximately seven (7) years.

II. Sampling Scheme

The location was separated into 8 quadrants (Figure 1). Within each quadrant, 15 – 17 subsamples were taken at random. The subsamples were collected along a zig-zag pattern at no more than 200 m apart to ensure adequate coverage of the site. No subsample was collected within three (3) metres of the boundaries of each quadrant. Each subsample was collected at a depth of 15 – 30 cm in polyethylene bags and sealed and consisted of approximately 300 grams of soil.

Subsamples were composited to obtain one (1) representative sample for each quadrant. Approximately one (1) kilogram of each of these samples was placed in a 1-gallon heavy duty Ziploc[®] bag, labelled and sealed. These laboratory samples were stored in a cooler with ice and transported to the Department of Chemistry at the University of the West Indies (Mona) for analysis. Replicate laboratory samples were also collected for analysis.

One additional sample was collected from the natural gully that runs through the property (Figure 1) and submitted to the laboratory for analysis.

Samples were collected over two days (May 18 – 19, 2009). The samples collected on Day 1 were stored at less than 10°C until transport of all samples to the laboratory on Day 2. The coordinates of selected sites were recorded using a Garmin[®] GPS 76 handheld GPS navigator (Table 1) and a map (Figure 1) was generated in Google Earth.

Figure 1: The WHIM, Old Harbour, St. Catherine



Note: aerial photograph is over 4 years old

Table 1: Map positions (Google Earth)

Placemarks on Map	Coordinates	
W1	17°55'52.69"N	77° 6'54.79"W
W2	17°55'47.60"N	77° 6'52.66"W
W3	17°55'32.71"N	77° 6'46.18"W
W4	17°55'13.60"N	77° 6'37.15"W
W5	17°54'59.26"N	77° 6'29.24"W
E1	17°55'55.11"N	77° 6'33.48"W
E2	17°55'50.08"N	77° 6'31.40"W
E3	17°55'38.35"N	77° 6'25.50"W
E4	17°55'31.87"N	77° 6'21.10"W
E5	17°55'20.69"N	77° 6'18.00"W
M1	17°55'49.27"N	77° 6'41.96"W
M2	17°55'35.53"N	77° 6'35.69"W
M3	17°55'26.87"N	77° 6'29.41"W
M4	17°55'22.95"N	77° 6'26.73"W
M5	17°55'16.58"N	77° 6'21.78"W
M6	17°55'11.57"N	77° 6'18.38"W
Sample taken in Gully	17°55'52.26"N	77° 6'41.25"W

(Placemarks at corners of each quadrant)

III. Methods

The laboratory samples were screened for pesticide residue using EPA Pesticide Residue Analytical Methods at the Pesticide Research Laboratory, Department of Chemistry, University of the West Indies (Mona).

The analysis involved determined the total toxic residue of the pesticide regulated by the tolerance, including any significant metabolites and degradates. Analysis was done by Gas Chromatograph fitted with Mass Selective Detector. Analytical detection limit was 10 parts-per-billion (ppb) for pesticides in question.

IV. Results

Table 2: Results of Pesticide Screening (Department of Chemistry, U.W.I.)

Quadrant Number	Pesticides Detected
1	no pesticide residue detected
2	no pesticide residue detected
3	no pesticide residue detected
4	no pesticide residue detected
5	no pesticide residue detected
6	no pesticide residue detected
7	no pesticide residue detected
8	no pesticide residue detected
Sample taken in Gully	no pesticide residue detected

V. Summary of Results and Conclusions

The extensive sampling scheme detailed in Section II (Methods) followed internationally accepted procedures for the collection and storage of soil for pesticide analysis.

All subsamples collected from the quadrants were similar in texture and colour (clayey, red-brown, moist but not wet). An additional sample was collected from the natural gully because of the difference in its appearance. This sample was also red-brown in colour but contained many small stones.

Much of the land consisted mainly of grass and the top four (4) centimetres of soil was black probably due to recent burning. It was noted that the land was being used as pastureland for a cows and goats.

The results of the analyses revealed an absence of pesticide residue, metabolites and degradates in all of the samples collected.

VI. References

Tan, K. H. *Soil sampling preparation and analysis*. 2nd Ed. CRC Press.

Carter, M. *Soil sampling and methods of analysis*. Canadian Society of Soil Science. Lewis Publishers.

U. S. Environmental Protection Agency (Pesticides). <http://www.epa.gov/pesticides/index.htm>