CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Petroleum hydrocarbons are used generally in our environment as fuel and chemicalcompounds. The uncontrolled release of petroleum hydrocarbons negatively impacts many of our soi1 and water resources. The contamination can result from leaking Underground Storage Tanks (UST), petroleum refineries and bulk storage facilities, broken oil pipelines, spills of petroleum products in chemical plants and transportation processes as well as commercial and industrial uses(automobile workshops)under which this research work falls into. The risks of explosion and fire are also serious threats to the environment.

Total Petroleum Hydrocarbons (TPH) concentration is a global parameter includingmany derived petroleum products, commonly applied to establishtarget soil cleanup levels implemented by several regulatoryagencies (Presidency Ministry, 2005; VROM, 2012; Weisman, 1998).The Standard ISO 16703 (ISO,2004) is an internationally acceptedmethod to obtain TPHconcentrations from C10 to C40, althoughthere are other standards currently in use (Rosano-Hernández et al., 2012).

The Environmental Protection Agency (EPA) has reported that due to the uncontrolled release of petroleum hydrocarbons into the environment, there has been a considerable amount of contamination in soil and groundwater. As reported by Gruiz and Kriston (1995) an amount of 6,000,000 tons petroleum waste enters into the environment each year causing serious environmental problems.

Even if the problems associated with fuel storage and distribution are solved, contamination incidental to production and commercial usage would continue to threaten groundwater supplies. Many manufacturing processes necessarily produce water and sludge that are contaminated with hydrocarbons.

High concentration levels of hydrocarbons present in contaminated sites could pose a health risk to humans, plants and animal lives. In recent years, the release of hazardous and toxic substances into the soil, water, sediment and air in Niger Delta, Nigeria has been a widespread problem. The economy of Nigeria, the most populous, black African country is largely dependent on crude oil tapped from the Niger Deltaregion. Niger Delta has a population of about 30 million and an estimated 2.8 million barrels of crude oil per day come from this region.

STATEMENT OF PROBLEM

In evaluating the relevance of pollution cleanup standards, thereare many things that must be considered. Risk factors such as fate, transport, and toxicity of constituents, and monetary factors such as expected cost of remediation are but just afew of the considerations that must be addressed in such an endeavor.This hypothesis evaluates, from a risk and cost perspective, the use of TPH as a cleanupstandard for remediation of petroleum contaminated soils and compares the use of a TPHstandard to a compound specific standard. This thesis also analyzes sampling and analysisData contained in the Installation Restoration Program Information Management System(IRPIMS) database to evaluate the use of the compounds upon which current statestandards are based.

1.3 SCOPE OF THE STUDY

The scope of this study covers the sampling exercise, field study, a laboratory analysis of samples obtained and interpretation of laboratory data using statistical, graphical illustration. The field study was carried out in Warri Metropolis (Warri, Effurun, Ughelli and Udu), Delta State. Soil samples were collected at different

points in the workshops (main workshop and 10metres away from the main workshop).

1.4 OBJECTIVES OF STUDY

The aim of this study is to determine the concentration levels of total petroleum hydrocarbons (TPH) in soils found in automobile shop (keke, car, bikes, and truck workshops).

Objectives:

The objective of this work is to ascertain the level of TPHin analyzed samples.

To determine the concentration of TPHin the selected locations ofWarri Metropolis (Warri, Effurun, Ughelli and Udu).

To evaluate the impact of TPH on soil consequently, the risk posed to public health as a result of the identified pollution.

DETERMINATION THE CONCENTRATION LEVELS OF TOTAL PETROLEUM HYDROCARBONS (TPH) IN SOILS FOUND IN AUTOMOBILE SHOP