

*Analysis of*

**SOILS**  
Contaminated  
*with*  
**Petroleum**  
**Constituents**

O'Shay/Hoddinott

EDITORS



STP 1221

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# ***Analysis of Soils Contaminated with Petroleum Constituents***

*Tracey A. O'Shay and Keith B. Hoddinott, Editors*

ASTM Publication Code Number (PCN)  
04-012210-38



ASTM  
1916 Race Street  
Philadelphia, PA 19103  
Printed in the U.S.A.

## Library of Congress Cataloging-in-Publication Data

Analysis of soils contaminated with petroleum constituents / Tracey A. O'Shay and Keith B. Hoddinott, editors.

-- (STP ; 1221)

"Contains papers presented at the symposium of the same name held in Atlanta, GA on 24 June 1993 ... sponsored by ASTM Committee D-18 on Soil and Rock and its Subcommittee D18.06 on Physico-Chemical Properties of Soil in cooperation with the American Petroleum Institute"--Foreword.

"ASTM publication code number (PCN) 04-012210-38."

Includes bibliographical references

ISBN 0-8031-1898-8

1. Oil pollution of soils--Congresses. 2. Soils--Analysis--Congresses. I. O'Shay, Tracey A. II. Hoddinott, Keith B., 1956-. III. ASTM Committee D-18 on Soil and Rock. IV. ASTM Subcommittee D18.06 on Physico-Chemical Properties of Soil. V. American Petroleum Institute. VI. Series: ASTM special technical publication ; 1221.

TD879.P4A53 1994

628.5'5--dc20

94-14983

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Each paper published in this volume was evaluated by three peer reviewers. The authors addressed all of the reviewers' comments to the satisfaction of both the technical editor(s) and the ASTM Committee on Publications.

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The quality of the papers in this publication reflects not only the obvious efforts of the authors and the technical editor(s), but also the work of these peer reviewers. The ASTM Committee on Publications acknowledges with appreciation their dedication and contribution to time and effort on behalf of ASTM.

# Foreword

This publication, *Analysis of Soils Contaminated with Petroleum Constituents*, contains papers presented at the symposium of the same name held in Atlanta, GA on 24 June 1993. The symposium was sponsored by ASTM Committee D-18 on Soil and Rock and its Subcommittee D18.06 on Physico-Chemical Properties of Soil in cooperation with the American Petroleum Institute (API). Keith B. Hoddinott of Woolly Hill Farm in Street, MD and Tracey O'Shay of Gordon and Lawton Inc., in Austin, TX presided as symposium chair-people and are the editors of the resulting publication.

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# Overview

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Gasoline, oil, lubricants, and diesel fuel are all common compounds in our daily lives. These substances are the fuels that run today's complex society. Contained and used properly, they pose few problems. However, when spilled on the ground, they can cause massive problems in the environment. Such releases usually are followed by an assessment of the soil, and the degree and extent of environmental contamination. Here is where petroleum contaminated soils can become a hindrance.

The analytical methods usually used to determine the physical and chemical character of the soil become problematic when the soil is mixed with a petroleum product. Most petroleum products adhere to soil, making any particle size analysis difficult; are lighter than water, interfering with any density based analysis; are hydrophobic, reducing the ability to determine water permeability functions; and are bio-chemically active; altering the soil's biotic interactions.

The analysis of petroleum contaminated soil has baffled scientists in recent years. The need to remediate environmentally unfriendly activities at oil refineries, ship ports, oil drilling sites, and even gas stations has created a need to develop analytical techniques specially designed to overcome the difficulties of petroleum contaminated soils. To this end, ASTM, through its Committee D-18 on Soil and Rock, and the American Petroleum Institute co-sponsored a symposium on the Analysis of Soil Contaminated with Petroleum Constituents.

Papers in this Special Technical Publication (STP) were selected from the symposium submittals based upon pertinency, originality, and technical quality. All undergo peer review and most were extensively revised between presentation and publication. In this STP, papers were selected in two categories: the analytical procedures for soil contaminated with petroleum hydrocarbons and the behavior of hydrocarbon contaminated soils.

In addition to the authors of the individual papers, any success of this publication reflects the contributions of many people.

The symposium committee worked diligently in soliciting abstract submittals, in selecting promising presentations, and in chairing the sessions. The committee was composed of the following people: Tracey O'Shay, Gordon and Lawton, Keith Hoddinott, US Army Environmental Hygiene Ag., and Bruce Bauman, American Petroleum Institute.

The continued support of this symposium by the officers of ASTM Committee D-18 on Soil and Rock also was vital, since time from a more than full committee meeting schedule needed to be allocated for this endeavor.

Critical to maintaining the technical quality of this STP was the diligent work of the reviewers of the technical papers. Four reviewers were obtained for each paper to help ensure that the work reported was accurate, reproducible, and meaningful.

Considerable staff support was also required for the completion of this effort. The help of the symposium committee, the D-18 officers, the paper reviewers, and the ASTM staff is most appreciated. We trust that the papers in this STP, which the contributors labored hard to develop, will aid the efforts of industry towards the reliable prediction and quantification of these properties.

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ISBN 0-8031-1898-8