

# EVALUATION OF SITE CONTAMINATION FROM STORAGE OF FERTILIZER

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## INTRODUCTION

Australia has extensive agricultural production of crops and livestock production. Regular fertilizer application maintains the production rates (Fitzpatrick, 1968). Phosphorus-based fertilizers produced by sulfuric acid extraction at coastal production works are transported by train to distribution points. Bulk fertilizer is stored in large sheds adjacent to railway lines and large or small trucks then deliver to farms. The storage sheds usually have bare soil floors and over periods of time fertilizer levels can build up. The disused or abandoned sites may leave soil contaminated with fertilizer phosphate, sulfate and sometimes sulfur (FMA, 1998). Occasionally fertilizer storage sites have experienced contamination from railway engine or truck hydrocarbons (NSW EPA, 1994).

## OBJECTIVES

The objective of this study is to examine the extent of fertilizer contamination from phosphate, sulfate and sometimes sulfur at agricultural storage sites, identify environmental risks associated with the handling practices of storage sites, and distinguish from other contamination due to transport vehicles.

## METHODOLOGY

Soil samples were collected using a grid-base sampling program to identify analytes of concern (NSW EPA, 1995). Following preparation soils were analysed for phosphorus, sulfate, sulfur, petroleum hydrocarbons (aliphatic and aromatic), heavy metals and pesticides using standard procedures (ANZECC (1992; NEPM (1999; NSW EPA (1994; NSW EPA (1995). A 'within a target area' was used to assess contamination levels by comparing the 95% Upper Confidence Limit (UCL) of the average concentration of each analyte against respective 'contamination' criteria for industrial sites; exceedance of 95% UCL against site criteria identified contamination. "Hotspots" were identified when analytical results from individual sites were 250% of the relevant criteria value, and when the standard deviation of data was <50% of the criteria.

## RESULTS AND DISCUSSION

Statistical analysis of the data for different analytes in soil at fertilizer storage sites showed the relationship between contaminant levels and dispersion over respective sites (ANZECC (1992; NEPM (1999; NSW EPA (1994; NSW EPA (1995). Dispersion of constituents of phosphate-based fertilizers could distinguish extent of contamination during the operational phases of fertilizer handling activity from other vehicle-related contamination.

## CONCLUSION

Accurate estimation of contamination of sites could provide using the grid-base sampling approach and 95% Upper Confidence Limit (UCL) criteria to distinguish transport vehicle-related contamination from phosphate-based fertilizer on site.

## REFERENCES

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