A comparison of risks related to the storage of hydrocarbons in above-ground and underground tanks at petrol filling stations

A COMPARISON OF RISKS RELATED TO THE STORAGE OF HYDROCARBONS IN ABOVE-GROUND AND UNDERGROUND TANKS AT PETROL FILLING STATIONS

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CONTENTS

Contents continued...

Page

FOREWORD

In 2012 the Environment Agency and the Energy Institute (EI) commissioned a project to compare the risks associated with different tank storage and dispensing options at retail petrol filling stations (PFS)s.

This was done to progress practical protective solutions to industry's ongoing challenges arising from the position statements set out in *Groundwater Protection: Principles and Practice (GP3)* (see Environment Agency, 2012 and Annex B) particularly arising from the Environment Agency's approach for above-ground storage in the most sensitive locations.

The project compares both the qualitative spill and other risks of contamination to groundwater resources and the relative risks to human safety from above-ground and underground storage solutions. The main conclusions are set out as follows.

The report informs the position on underground storage tanks (UST)s and above-ground storage tanks (AST)s. The Environment Agency and the EI will agree how to compare effectively the relative risks from each. The plan is to use the outputs from the report as a basis for further collaborative work, including a joint workshop, before consideration is given to updating the current position in GP3.

At this time the published position in GP3 will remain in force although users should recognise the Important Note (page 53 and page 68 of Environment Agency, 2012) in the position statement on the storage of pollutants.

Main conclusions

– The key benefit of double skinned systems (tanks and lines) is not the double skin *per se*, but is the ability to perform leak detection between the double skins and to identify and rectify leaks before the second skin has also failed. Such systems, if correctly operated and maintained, should virtually eliminate leaks into the environment.
– Double skinned systems (USTs and ASTs) have lower spill risks to the environment than the single skinned storage systems considered in this report.
– Double skinned USTs with continuous leak detection monitoring and double skinned ASTs with leak detection applied between the skins and a bund with periodic inspection have comparable spill and other risks to the environment. ASTs have higher safety risks than USTs but this safety risk difference may or may not be material. In making this conclusion, the report has made certain assumptions regarding the performance of the leak detection system applied to the UST, as described in section 8.
– Currently, both USTs and ASTs may use underground pipework without explicit leak detection systems applied. The report questions if this is best available practice and the preference is to see all underground fuel pipework protected by active leak detection systems, especially if the environment is considered to be vulnerable.

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The work was undertaken by the Det Norske Veritas Ltd (DNV) UK project team: Mark Hunter, Consultant; Philip Nalpanis, Principal Consultant and Tim Fowler, Principal Consultant.

The project was steered by a joint EI and Environment Agency Steering Group.

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