

## **Executive Summary Text**

Work package 068(4/45/12)WSP 'Water Use in the Supply Chain' recognises the increasing water stress experienced within the UK and globally and the risk that this presents to Highways Agency non-office based operations. The study forms part of the Highways Agency's goal to understanding risks associated with water stress, how these risks could affect Highways Agency operations and what measures could be taken to mitigate these risks. The study highlighted that the volumes of water typically consumed by Highways Agency operations are likely to have little impact on water stress within the UK. However, the study has the potential to raise awareness of water stress throughout the construction industry and the wider population. This in turn may encourage a larger number of organisations to complete similar studies and the cumulative impact could be significant.

The Highways Agency has played a significant role in raising the profile of carbon management in the construction industry in recent years and can potentially do the same in terms of water use and management. The study is also considered important in assisting the Highways Agency in meeting their corporate sustainability targets.

### **Summary of water stress**

The greatest levels of water stress are located within the South East and East of England, predominantly as a result of low average rainfall and high population densities. However, the study has highlighted that a drought situation can occur anywhere in the UK.

### **Summary of measures implemented to control water stress**

Water resources are managed by the EA and water companies. During a drought situation, restrictions may be applied to the volume of water that can be consumed or the types of activities that can be undertaken. The majority of these restrictions are applied to non-essential domestic water uses and typically occur no more than once every ten years. If a drought worsens, a greater range of non-essential water consuming activities may be restricted such as cleaning commercial vehicles and plant, dust suppression and cleaning external areas. This would typically occur no more than once every 20 to 40 years.

### **Summary of non-office based water use**

The study identified that the most common uses of water at construction sites and depots included:

- o Office facilities
- o Concrete batching
- o Wheel washing
- o Water specific construction activities
- o Road sweeping
- o Vehicle washing
- o Dust suppression
- o Salt brine
- o Plant washing
- o Irrigation

The majority of water for site office facilities and construction/maintenance activities is sourced from potable mains supplies. Some activities were identified to be sourced from water bowsers, although it is likely that these are also filled from mains water supplies.

Direct abstraction of water was identified as an alternative water supply on some sites, although none of the sites audited to inform this study sourced water from direct abstraction.

Some sites collect surface water runoff and rainwater for use within non-potable applications. Concerns have been raised regarding the quality of water collected from surface water runoff for certain applications (such as spray applications).

Many sites record the total volume of water obtained through the mains water supply. However, there is often no differentiation between the volume of water used in site office facilities and the volume of water used for construction/maintenance activities.

### **Impact of water stress on Highways Agency operations**

During a severe drought (i.e. once every 20-40 years or so) certain Highways Agency operations may be affected if a greater range of water use restrictions is implemented following approval of a Drought Order. The following water consuming activities may be affected:

- o Wheel washing
- o Plant washing
- o Road sweeping
- o Vehicle washing
- o Dust suppression
- o Irrigation

Restrictions will be exempt if they pose environmental, health or safety risks. Similarly, restrictions may not apply if it can be demonstrated that activities use water efficient technology.

The cost of potable and abstracted water may increase to encourage efficiency and fund investment in infrastructure.

### **Embodied water**

Embodied water is a significant contributor towards the total volume of water consumed directly and indirectly by the Highways Agency. Initial investigations suggest that indirect water consumption associated with the procurement of Highways Agency materials for non-office based activities is in the region of 3-4 million m<sup>3</sup> per year. This estimate is approximately 7 times greater than direct annual water consumption in non-office based applications.

### **Opportunities for Highways Agency operations**

The key benefits of improving water use efficiency and identifying more sustainable sources of water include:

- o Reducing the risk of water stress on Highways Agency operations and reducing the impacts of Highways Agency operations on water stress and the water environment;
- o Raising awareness of water stress throughout the construction industry and the wider population, thus encouraging a larger number of organisations to consider and reduce water consumption;
- o Reducing the indirect impacts of water consumption, such as associated energy demands, environmental impacts and social impacts;
- o Reducing the need for costly infrastructure works that will ultimately be reflected in the cost of water and subsequent water charges;
- o Raising awareness of embodied water impacts and the need to consider local water stress as part of responsible procurement.

Some of the opportunities that could be pursued by the Highways Agency to reduce risk and maximise opportunities associated with direct and indirect water use have been identified to include:

- o Raising awareness amongst Highways Agency staff, subcontractors and suppliers regarding water stress and the importance of water efficiency;
- o Metering and recording of water use to differentiate between water used for office/welfare facilities and water used for construction/maintenance activities;
- o Leak detection;
- o Use of water efficient fixtures and appliances;
- o Use of appropriate water efficient construction techniques and water efficient plant.
- o Investigating alternative sources of water where possible and where appropriate;
- o Preparing for a drought situation and responding to EA and water company awareness campaigns.