Leakage Investigation Survey
15-16 December 2015

Industrial Park, Newcastle

Mains water meter information

Size (mm)	15-28		32-50		75-100	✓	125-200		Above 200mm	
Serial number	00W068886									
Readings (1)	162603.100				Time:		09:32 15 December 2015			
Readings (2)	162669.500				Time:		08:47 16 December 2015			
Location	Meter located under large metal lid in grounds of Esso petrol filling station. Requires 2x lifting keys to access									

Leakage Activities

Acoustic sounding	✓	Correlation	✓	Ground microphone		Environmental Inspection	✓
Other							
Pipe traced					Distance		
Pipe correlated	Accelerometer	✓	Hydrophones		Distance	800m	

Background Information

Recent meter readings show a high volume of water consumption through the meter, which does not correspond to any increases in legitimate water usage on the industrial park.

Industrial Park was previously owned by British Gas as a depot, training centre and gas distribution point. It is now occupied by a number of users, including Dawsonrent, Marshalls (mortar plant) and Colas.

Activity Summary

Pipework & Metering

The water meter is located in the grounds of the Esso petrol filling station just off the A1. It can be found in a dip in the ground amongst landscaping roughly between the shop and the dual carriageway.

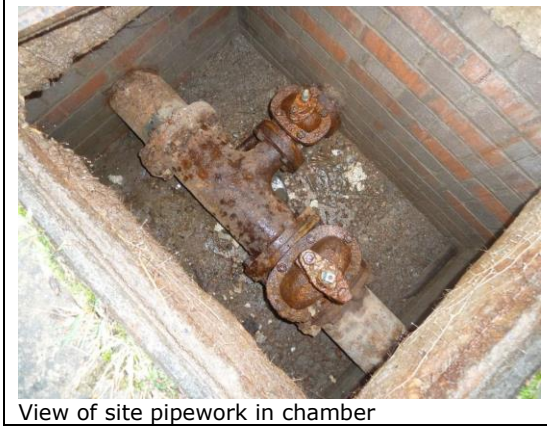
Main meter location off filling station forecourt


Main meter


Main meter chamber (flooded)

Additional Northumbrian water meters were found supplying the premises around Derwent Haugh Industrial Park: Esso petrol filling station, Premier Inn and the car wash centre.

Pipework around the site is formed of a number of different materials. From the meter to the Transco compound the pipework is marked as 8" or 9" uPVC, then on the site itself it was visually confirmed to be mainly 6" and 3" cast iron, with some sections of MDPE (Medium Density PolyEthylene). Isolation valves are visible in chambers around the park but these were not operated due to their age and likelihood of being damaged due to lack of operation over the last few years.

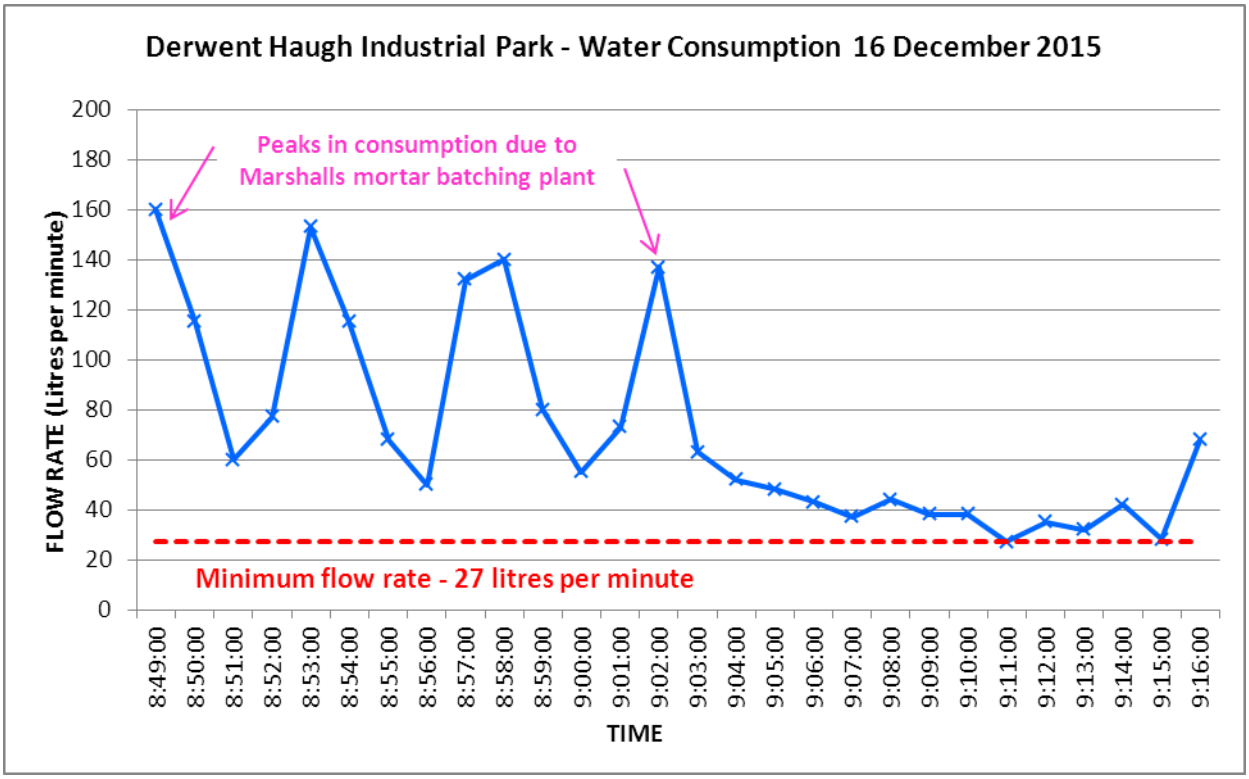

View of site pipework in chamber


Section of sliplined pipework leading to workshops

Water Consumption

The water meter was monitored several times throughout the survey and on all occasions was found to be recording water consumption at a minimum rate of 27 litres per minute (38.8m³ per day). With no other major water users on the site, it is expected that this flow rate represents the volume of leakage occurring on pipework to or around the industrial park.

When the cement batching plant is in operation a higher flow rate can be seen through the meter as shown in the chart below:



Leakage Survey Activities

With the water meter recording a minimum consumption of 27 litres per minute, a leak detection survey was carried out across the extent of the known network on the industrial park.

A full acoustic survey was carried out using plans of the water network provided by Colas, but this did not identify any areas of interest. The likely route of the water pipework from the water meter towards the incoming main point in the Transco compound was walked and acoustically sounded in likely areas of leakage (large pools of standing water). Again, no areas of interest were identified.

A full correlation survey was also completed on the site but this did not reveal any areas of interest. Given that the pipework material is largely cast iron throughout, a good result should have been easily obtainable if a leak had been present on the main part of the site.

Sub-metering

Whilst carrying out the survey, all occupied buildings were checked for sub-metering. A list of buildings, occupiers and sub-meters is shown in the chart below:

Derwent Haugh sub-metering				
Building	**Sub-meter**	**Reading**	**Date**	**Time**
Compound 5 Marshalls	0903000273	19427.322 19448.562	15/12/15 16/12/15	10:56 11:01
Unit K Dawson Rentals	14A017503	903.698 905.000	15/12/15 16/12/15	11:20 14:04
Unit A Colas offices	14A014903	1739.009	16/12/15	13:52
Unit B	empty			
Unit C A1 plus (Colas)	14A008304 14A008302	72.134 150.107	16/12/15 16/12/15	13:15 13:15
Unit D	empty			
Unit E	empty			
Unit F	empty			
Unit G	empty			
Units H/N Colas workshops	14A008808	229.959	16/12/15	13:33
Compound X9 Colas	14A017504	585.254	16/12/15	13:43

Marshalls meter

Meter location under mortar batching plant

Dawson Rentals meter

Meter location in plant room

Unit A - Colas offices meter in gas meter cupboard

Unit C – A1plus meter 1

Unit C – A1plus meter 2


Unit C meter location


Unit H/N meter


Unit H/N meter location

Compound X9 meter


Compound X9 rising main in metal container

Summary & Recommendations

Summary:

1. Below ground leakage confirmed to be running at a maximum rate of 27 litres per minute or 38.8m³/day; this equates to an **unaccounted cost of £79.93 per day** and **£29,173.72 per annum**.

2. No leakage identified on the park itself – likely to be on pipework from meter across fields or unknown area of pipework on the park;

3. All occupied units on the industrial park are fitted with sub-meters;

4. Marshalls are the largest water user on the site – used 20m³ over 24 hours throughout the survey;

5. Pipework passes through Transco land when off-site main enters the industrial park.

Recommendations:

1. It is recommended in the first instance to try and identify the approximate area of leakage by operation of some of the old isolation valves on the site, but this must be carried out on the understanding that the packing glands may start leaking or the spindles could have rusted through. It is therefore advisable that a repair team is available on a standby basis in case of leaks caused by the operation of old valves. It is also likely that the valves will not close fully due to age and lack of operation, but it may just be possible to confirm a high volume of water flowing under the gate of the valve by acoustic sounding.
   This will be the most cost effective first stage, the results of which will dictate the next stage of works.
   After these tests are completed we would also recommend a technical project meeting in the afternoon to discuss and agree the way forward as due to the age of the pipework, the size and other site issues (for instance pipework underneath gas pumping complex) there will be challenges so we will be seeking the most cost effective solution to the leakage issues.

   Site Visit, Trace & Test = £TBA + VAT

2. In the event of leakage on the industrial park, it is recommended that the water network is rationalised rather than repairing burst mains. Also the requirement to maintain fire hydrants would need to be confirmed for insurance purposes.

Survey carried out by

Engineer	H2O Building Services	Date	15&16 December 2015