

**THAMES WATER UTILITIES LTD**  
**WATER SYSTEMS PLANNING – THAMES VALLEY**

NM1091 Bicester Office Park, Lakeview Drive, Bicester  
OX26 1DE  
NM1153 Catalyst Bicester, Wendlebury Rd, Bicester,  
OX25 2PA

**Development Impact Assessment**



**Company Confidential**

**Document history**

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This Modelling Study is Valid for a Period of 18 Months from the Date of Authorisation

## Sign-off Sheet



### Development Impact Assessment (DIA)

NM1091 Bicester Office Park and  
NM1153 Catalyst

Date:

05/07/2021

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Project Name:

NM1091 Bicester Office Park and  
NM1153 Catalyst

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Report Ref:

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## Sign-off Sheet

<b>Project Name</b>	NM1091 Bicester Office Park and NM1153 Catalyst
<b>Project No</b>	NM1091 and NM1153
<b>Report Reference</b>	RPT_NM1091_NM1153

<b>Revision</b>	<b>Date</b>	<b>Description</b>	<b>Author</b>	<b>Check</b>	<b>Review</b>
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## Abbreviations

ADD	Average Day Demand
AORTA	Asset and Operations Real Time Analytics
CMP	Critical Monitoring Point
CPP	Critical Pressure Point
DMA	District Metered Area
DS	Developer Services
DYAA	Dry Year Annual Average Demand
DYCP PD	Dry Year Critical Period Peak Day Demand
DYCP PW	Dry Year Critical Period Peak Week Demand
FMZ	Flow Monitoring Zone
LoS	Level of Service
POC	Point of Connection
PRV	Pressure Reducing Valve
TWUL	Thames Water Utilities Ltd

## 1.0 INTRODUCTION

### 1.1 Key Information

Table 1 below provides an overview of the DIA study covered in this report.

<b>DIA Reference</b>	NM1091 & NM1153
<b>DIA Address</b>	NM1091 Bicester Office Park, Lakeview Drive, Bicester OX26 1DE  NM1153 Catalyst Bicester, Wendlebury Road, Bicester OX25 2PA
<b>Proposed Development Details</b>	<p><u>NM1091 Bicester Office Park.</u></p> <p>An office development with a total floor area of 60,000m<sup>2</sup> Ground storage tanks are to be installed; Domestic supply only</p> <p>Developer provided 2 examples: 30k sq ft (2800m<sup>2</sup>) Their inflow calculation based on LU= 0.8l/s</p> <p>50k sq ft (4650m<sup>2</sup>) Their inflow calculation based on LU = 1.16l/s</p> <p>If you use the same analogy for a total 60k m<sup>2</sup> <u>Their total requirement ~15 l/s (based on 2hr refill time)</u></p> <p>Our calculation based on 3 l/m<sup>2</sup>/d = 2.1 l/s Av; PID 4.7 l/s</p> <p><u>Until more detailed calculations are received to justify the inflow requirement and why its based on such a short tank refill time the DIA will be based on our estimated direct connection PID of 4.7l/s (based on type 3)</u></p> <p><u>NM1153 Catalyst</u></p> <p>14 industrial/office units with total area of 27,000m<sup>2</sup> Direct connection, no ground storage tanks</p> <p>Assumed 4l/m<sup>2</sup>/day (1.25 l/s) and Peak Instantaneous Demand (PID) of 2.8 l/s; Type 3, 10hr commercial profile</p>
<b>Construction Period</b>	Between 2020 and 2025
<b>Zone/DMA</b>	ZARDLY

**Table 1 : DIA Key Information**

## 2.0 HYDRAULIC MODELLING

The peak day model prepared as part of Ardley Growth Re-Assessment which has been used for this study. The 2025 PD model was used as the base scenario by including all the future developments except NM1091 and NM1153, these developments are included for the impact assessment.

The model was updated based on Vcap data for Kingsmere and Graven Hill developments. Figure 1 shows location of POC for NM1091 and NM1153.

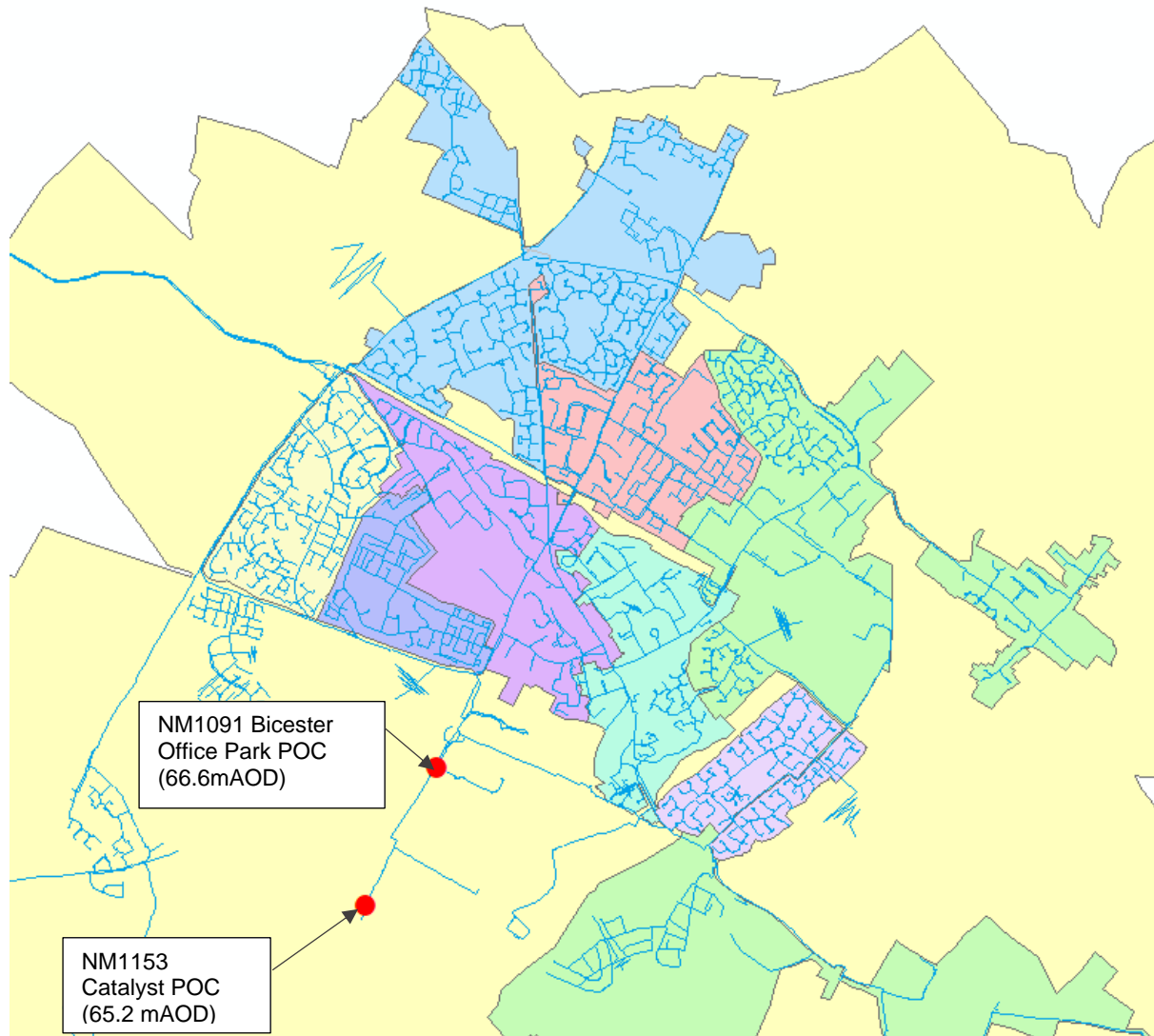


Figure 1: Location of point of connection (POC) for NM1091 and NM1153

## 3.0 IMPACT ASSESSMENT

### 3.1 Model Analysis

In order to analyse the impact of NM1091 and NM1153 a base scenario for 2025 was used, including future developments within the DMA. The impact scenario includes the Bicester Office Park and Catalyst demand to assess if the required demand can be met with no significant detriment to the current DMA.

Table 2 shows the model scenarios used to assess the impact of the possible future developments:

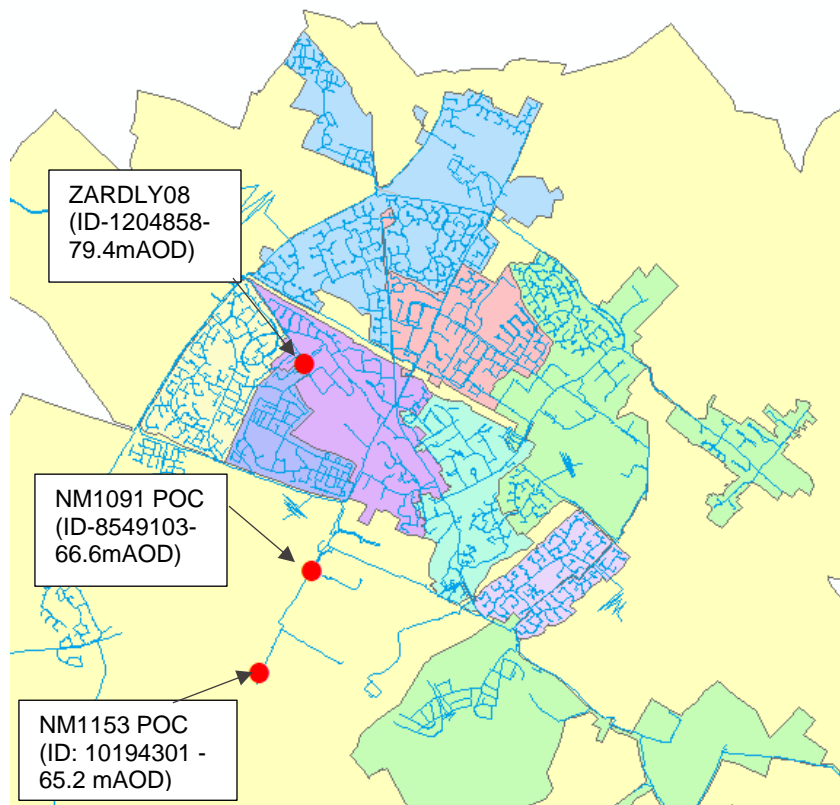
Scenario Name	Scenario Description
DYCP_PD_2020-2025	Existing model with all the future developments except NM1091 and NM1153 (Base Model)
DYCP_PD_2020-2025_IMPACT	Base model with NM1091 and NM1153 (Impact)
DYCP_PD_2020-2025_SOL	Solution scenario (Ardley growth re-assessment solution)

**Table 2: Model Impact Scenarios**

### 3.2 Impact Assessment

In order to assess the impact of the developments on the existing network the pressures for each scenario were compared at the location shown in Figure 2. Due to localised issues at ZARDLY03 and ZARDLY06 both have been excluded from the modelling analysis.





**Figure 2: Proposed development location**

Table 3 summarises the impact assessment, highlighting the lowest pressures for each of the comparison scenarios at each POC.

Location	POC (NM1091)	POC (NM1153)	Low pressure at ZARDLY08
Junction ID	8549103	10194301	1204858
Elevation (mAOD)	66.6	65.2	79.4
2025 DYPD (m)-Base	28.8	30.1	12.8
2025 DYPD + NM1091 & NM1153 (m)-Impact	28.6	29.9	12.6
Impact (pressure drop) (m)	0.2	0.2	0.2

**Table 3: Lowest Pressures and Impacts**

As discussed earlier, please see the below table for the 4.7l/s applied as constant demand for 24 hours at NM1091 POC.

Location	POC (NM1091)	POC (NM1153)	Low pressure at ZARDLY08
Junction ID	8549103	10194301	1204858
Elevation (mAOD)	66.6	65.2	79.4
2025 DYPD (m)-Base	28.8	30.2	12.6
2025 DYPD + NM1091 & NM1153 (m)-Impact	27.6	29.0	11.5
Impact (pressure drop) (m)	1.2	1.2	1.1

As shown in Table 3, pressures at the POC and ZARDLY08 both show a reduction of 0.2m in the impact scenario. The pressure at ZARDLY08 junction is already below acceptable limits, however, there is still a minor reduction in the impact scenario.

## 4.0 SOLUTION DEVELOPMENT

### 4.1 Solution Development

The solution proposed is rezoning the current DMA's, as part of the Ardley Growth Re-assessment, to improve pressures above 20m where possible. The following changes have been (outlined below) made in the model, for full information on the changes see section 6.1.4 in the Ardley Growth Re-assessment Report\_Second Issue.docx.

- Rezone part of ZARDLY08 and ZARDLY05 onto ZARDLY02
- Open valve 683543 and install a meter to provide additional feed to ZARDLY08

Location	POC (NM1091)	POC (NM1153)	Low pressure at ZARDLY08
Junction ID	8549103	10194301	1204858
Elevation (mAOD)	66.6	65.2	79.4
2025 DYPD (m)- Base	28.8	30.1	12.8
2025 DYPD + NM1091 & NM1153 (m)-Impact	28.6	29.9	12.6
Solution_2025 DYPD+ NM1091 & NM1153 (m)	29.5	30.8	21

Table 4: Lowest pressures and impacts with solution

### 4.2 Fire Flow analysis

The solution model was simulated with fire flow of 25 l/s at the POC, and it was unfeasible. However, Fire flow of 23 l/s and 9.5 l/s would be available at NM1091 and NM1153 respectively.

## 5.0 CONCLUSION

The NM1091 and NM1153 developments cause a pressure drop of 0.2m which is not significant. However, all the future developments within the Bicester area impacts network pressure and therefore, rezoning part of ZARDLY08, ZARDLY05 into ZARDLY02 is recommended.

The RfP called for PRV size to each tank for the NM1091 developments information but the regarding the number of tanks is unavailable. Once the information is available from Developer service the study can be revisited to design the PRVs.