

Memorandum Report

16 December 2020

TO: Kerri McGuire (Graham + Sibbald)

FM: Michael Lynch (Mabbett)

CC: Dan Colby (Mabbett)

RE: PROPOSED ROADSIDE SERVICES DEVELOPMENT – KELTY, FIFE: AIR QUALITY SCREENING

1.0 Introduction

1.1 Background

On behalf of TG Convenience Stores Ltd (SGN Ltd), Graham + Sibbald Ltd (Graham + Sibbald) are looking to progress a proposed roadside services development to planning application stage.

The proposed site is located at Kelty, Fife and the proposal will involve the construction of a petrol filling station and development of a McDonald's drive-thru restaurant. Pre-application discussions have been undertaken with Fife Council, and as a result Graham + Sibbald has requested that Mabbett provide services to support the planning requirements associated with the project, specifically in relation to the completion of an air quality screening assessment.

This memorandum report summarises the assessment which was undertaken.

1.2 Pre-application Response

In response to pre-application consultation, Fife Council advised:

Air quality matters should be considered as part of any further application. Once the development proposals are finalised and predicated traffic flows/numbers are known an initial screening assessment should be undertaken. The outcome of such will determine whether further assessment is required.

The applicant should consider the impacts of potential queueing / idling vehicles associated with the drive-thru and demonstrate that the proposal will not jeopardise the achievement of statutory air quality objectives.

All air quality reports should be prepared in accordance with TG 16, PAN 51 and the latest technical guidance as cited in our booklet "Fife Air Quality Development Guidelines", online at www.fife.gov.uk/airquality.

1.3 Procedure for Assessing and Addressing Air Quality Concerns

The "Fife Air Quality Development Guidelines" booklet referenced above is assumed to refer to the "Air Quality in Fife Advice for Developers" document published in the noted location. Figure 1 from this



Mabbett & Associates Ltd, Corporate and Registered Office: Mabbett House, 11 Sandyford Place, Glasgow, U.K. G3 7NB
Registered in Scotland No: SC 163378 info@mabbett.eu www.mabbett.eu

Belfast | Cardiff | Dublin | Edinburgh | Glasgow | Inverness | Liverpool | Middlesbrough

document is reproduced below. The relevant screening criteria in this are based on the guidance document: "Land-use Planning & Development Control: Planning for Air Quality" issued by the Institute of Air Quality Management (IAQM). IAQM is the original author of the screening criteria, and its guidance/wording has been preferentially used as opposed to Fife Council's in some instances.

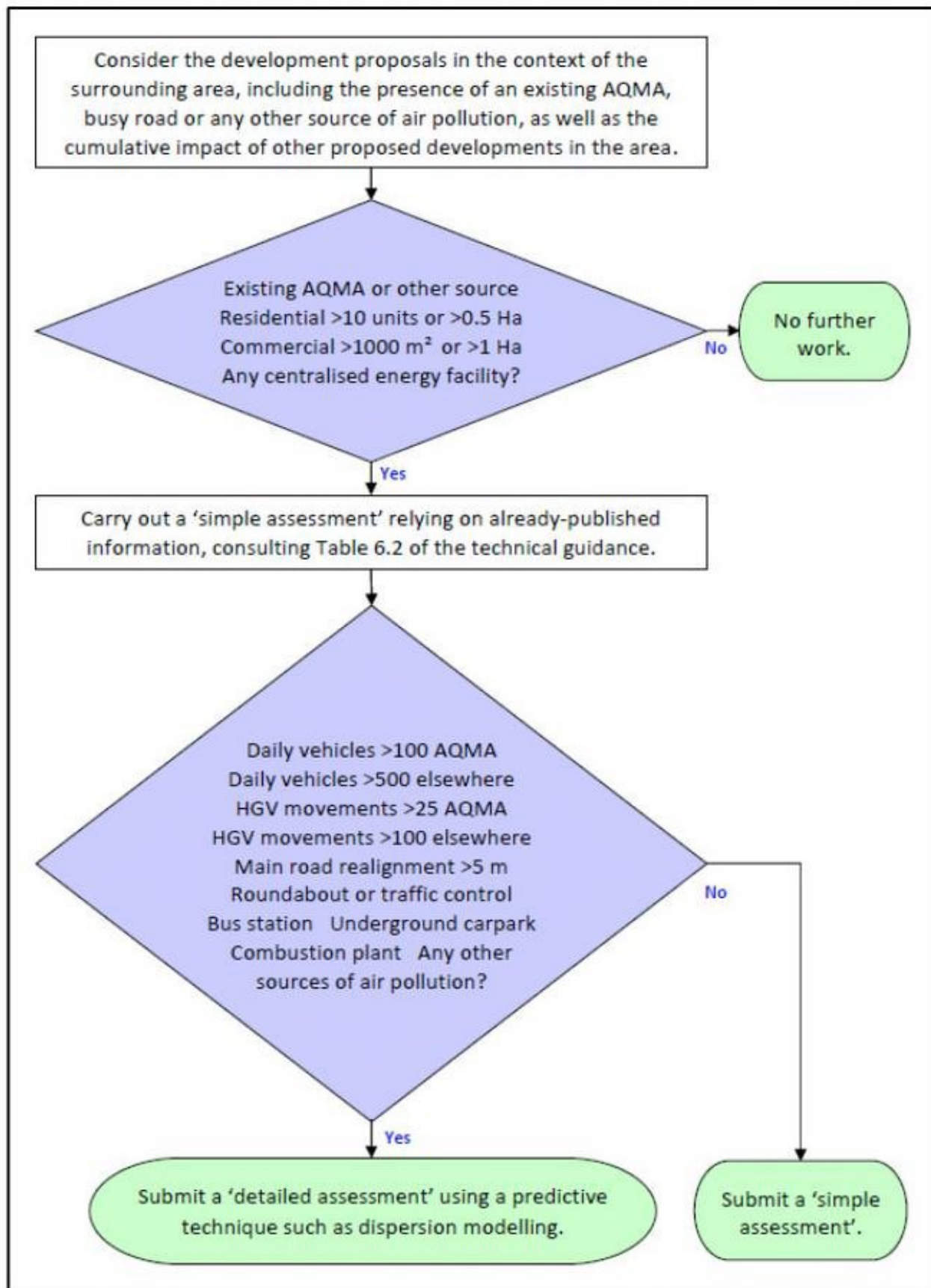


Figure 1: Procedure for Assessing and Addressing Air Quality Concerns (Fife Council)

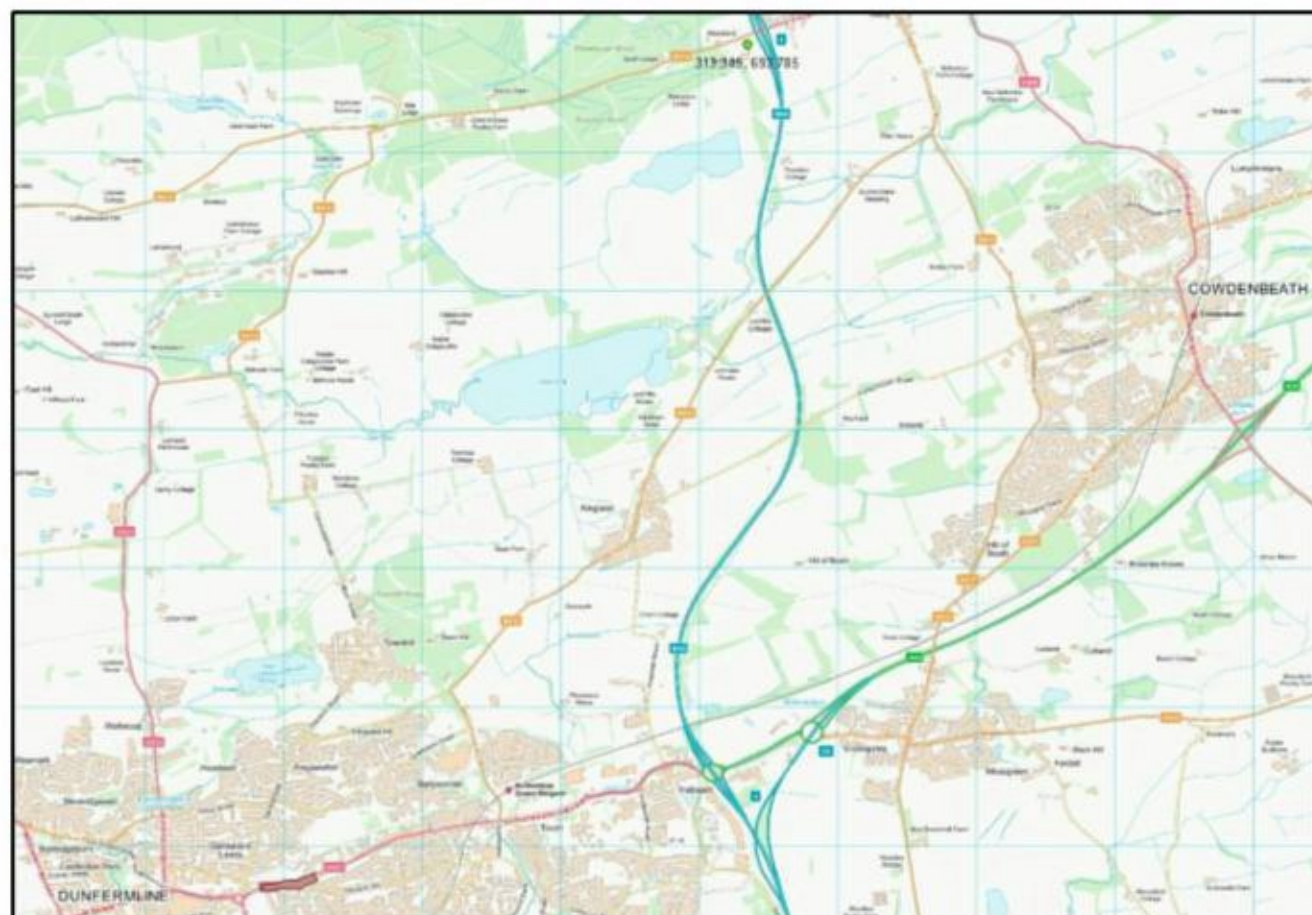
2.0 Ambient Air Quality

2.1 Air Quality Management Areas

There are two Air Quality Management Areas (AQMAs) within Fife:

- Bonnygate, Cupar
- Appin Crescent, Dunfermline

Neither is near to the proposed development site. Appin Crescent is the closest, around 6.75 km to the south west of the site. Figure 2 below shows the site (green circle, top middle of image) in relation to the Appin Crescent AQMA (red shaded area, bottom left of image). The Bonnygate AQMA is around 32 km to the north east.



Contains Ordnance Survey Data © Crown Copyright and Database Right 2020

Figure 2: Location of the Appin Crescent AQMA Relative to the Development Site

2.2 Monitoring Stations

There are no monitoring stations within a useful distance of the proposed development site. The closest two are located in Dunfermline (near to the AQMA in Figure 2) and Rosyth, each being located at roadside. This can often be taken as indicative of good air quality (monitoring stations are generally located in areas with poor air quality).

2.3 Diffusion Tubes

Non-automatic monitoring of nitrogen dioxide (NO₂) is carried out using diffusion tubes at 55 sites (total of 71 tubes) across Fife. There are no tubes within a useful distance of the proposed development site, the closest being in Cowdenbeath at a kerbside location. This can often be taken as indicative of good air quality (monitoring stations are generally located in areas with poor air quality).

2.4 Background Maps

Background pollutant maps are available for Scotland in 1km x 1km squares¹. They were most recently updated based on a base year of 2018, projected up to 2030. The projection assumes a trend of decreasing concentration year-on-year. Table 1 below summarises the annual mean data for the grid square centred on 313500, 693500. This point is located around 300m to the south east of the development site, adjacent to the M90, and the motorway crosses the full extent of the square from north to south.

Pollutant	2018 ($\mu\text{g}/\text{m}^3$)	2019 ($\mu\text{g}/\text{m}^3$)	2020 ($\mu\text{g}/\text{m}^3$)	Air Quality Objective ($\mu\text{g}/\text{m}^3$)	Comment
PM ₁₀	10.3	10.1	9.9	18	-
NO _x	12.4	11.8	11.2	30	Objective applies to protection of vegetation and ecosystems only
NO ₂	8.7	8.3	7.9	40	-

Table 1: Background Pollutant Concentrations

The ambient pollutant concentrations in the vicinity of the site appear to be comfortably below the relevant air quality objectives.

2.5 Other Developments

A review of the Fife Council planning portal was undertaken, for applications made within the last two years (from 20 November 2020), to identify other developments which could influence air quality around the proposed development site. No planning applications were identified.

2.6 Traffic Data

Livingstone & Partners Ltd (LPL) has undertaken a transport assessment for the proposed development, and annual average daily traffic (AADT) flow data has been prepared. This is summarised below.

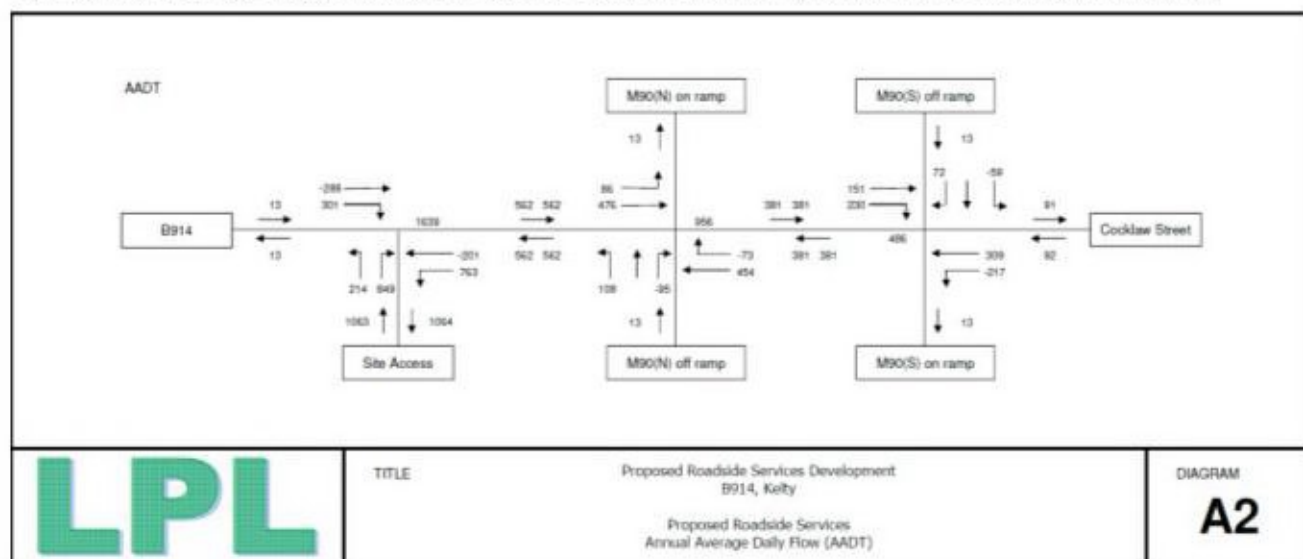


Figure 3: AADT Data

LPL report that heavy duty vehicles (HDVs) are expected to account for no more than 5% of the total AADT figures.

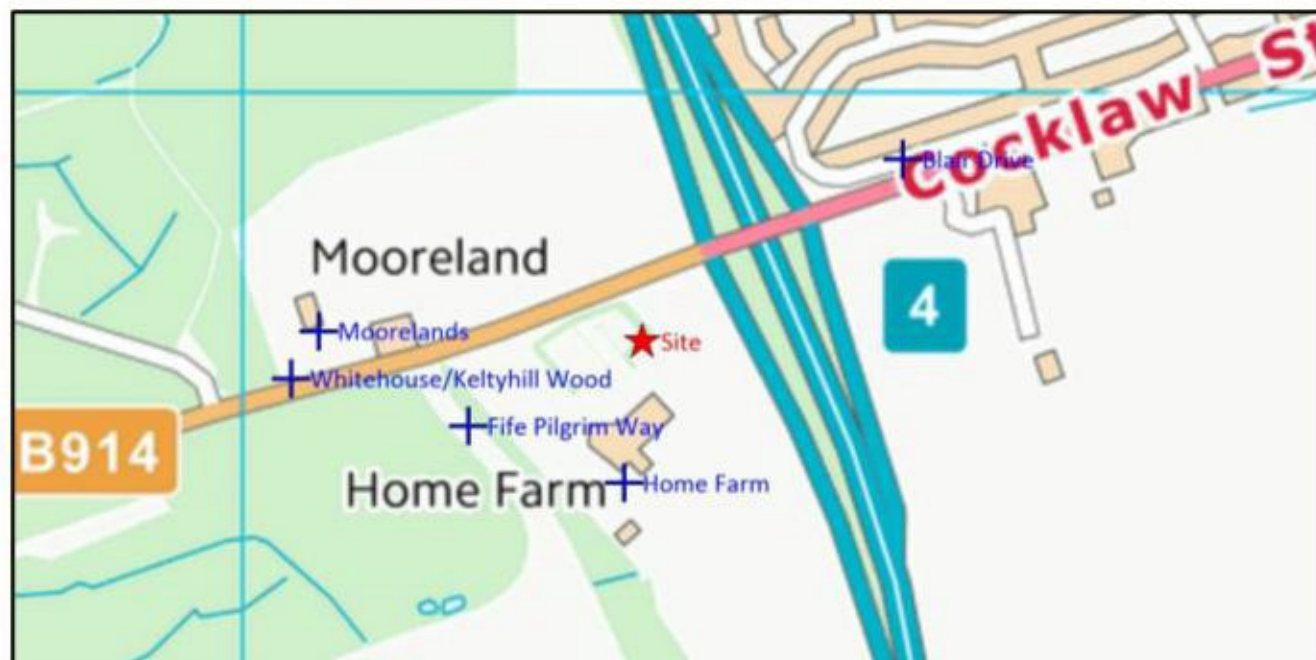
3.0 Receptors

A review of the surrounding area was undertaken to identify potential sensitive receptors in the area of the proposed development site. Those that were identified are outlined below.

¹ <http://www.scottishairquality.scot/data/mapping?view=data>

3.1 Human Health Receptors

The highest risk human health receptors which were identified are shown in Figure 4 below. The red star represents the centre of the site, and the blue crosses the receptors. They include residential properties (Moorelands, Blair Drive and Home Farm) and Fife Pilgrim Way (a walking route). The nearest conservation area (see Section 3.2), Whitehouse/Keltyhill Wood, is also shown.



Contains Ordnance Survey Data © Crown Copyright and Database Right 2020

Figure 4: Receptors

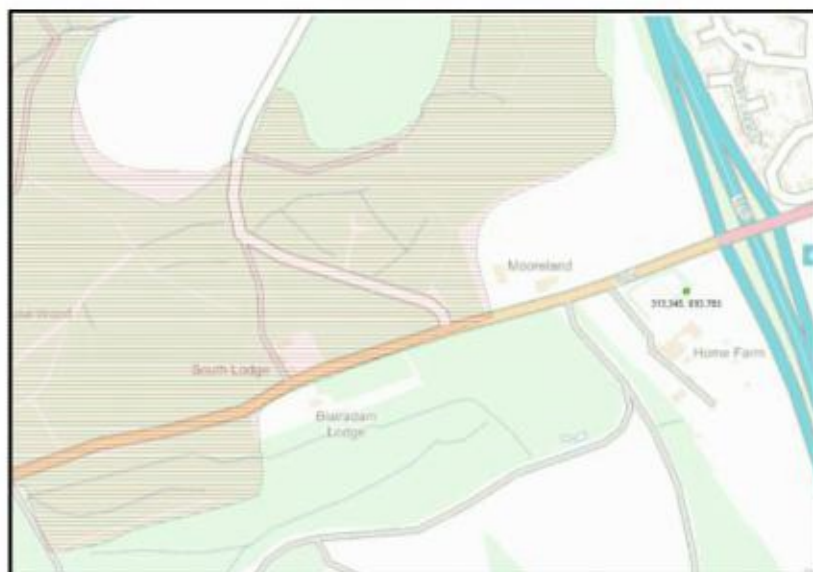
3.2 Conservation Areas

A review was undertaken to identify any conservation areas in the vicinity of the site. Areas within the distance thresholds outlined Table 2 were initially considered.

Site Type(s)	Distance Threshold
▪ Special Protection Areas (SPAs)	10 km
▪ Special Areas of Conservation (SAC)	
▪ Ramsar	
▪ Sites of Special Scientific Interest (SSSI)	2 km
▪ Local Nature Sites e.g. Ancient Woodland	

Table 2: Conservation Site Distance Thresholds

No SSSI or ancient woodland was identified within 2 km, there is however some long-established woodland around 200 m to the west of the site boundary, shown in Figure 5. The woods are hatched red, and the site represented by a green circle. The nearest point of the woods is also shown in Figure 4.



Contains Ordnance Survey Data © Crown Copyright and Database Right 2020

Figure 5: Whitehouse/Keltyhill Wood

Loch Leven (Ramsar Site, SPA and National Nature Reserve) is around 5.3km to the north east of the development site. As a result of this distance, it can reasonably be expected that the impact of the development on Loch Leven will be low.

4.0 Screening Assessment

The following table summarises the status of the development site, relative to the primary screening criteria outlined in Figure 1.

Criterion ²	Status
Presence of AQMA, busy road or other source of air pollution, as well as the cumulative impact of other proposed developments in the area	<ul style="list-style-type: none"> • There is no AQMA near the site • At its nearest point the site is around 44 m to the M90, and 9 m to the slip road for the M90 exit • No other significant sources of local air pollution were identified • No other proposed developments in the area were identified
More than 1,000 m ² of floor space or a site area greater than 1 ha	The site area is 1.14 Ha.
The development has more than 10 parking spaces	The development has 49 car spaces, 6 motorcycle spaces and 4 HGV spaces.
Centralised energy facility or other centralised combustion process	All heating is provided by electric boilers, there is no centralised combustion plant.

Table 3: Screening Criteria

Based on the above, the development cannot be screened from an air quality assessment. The next step is to establish whether a simple or detailed assessment is required.

5.0 Assessment Type

The following table summarises the status of the development site, relative to the secondary criteria outlined in Figure 1.

² Some additional/revised wording taken from IAQM's Land-use Planning & Development Control: Planning for Air Quality, not Fife Council Guidance. IAQM is the original author of the screening criteria.

Criterion ³	Status
<p>Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors (LDV = cars and small vans)</p> <p>A change of LDV flows of:</p> <ul style="list-style-type: none"> • More than 100 AADT within or adjacent to an AQMA • More than 500 AADT elsewhere 	<p>Whilst traffic flows in and out of the development are in relatively high (in excess of the 100 AADT threshold), the majority of this traffic is restricted to road areas which do not have receptors, as most of the traffic will enter and leave via the M90. Specifically:</p> <ul style="list-style-type: none"> • Development flows on the B914 west of the site access road (i.e. where there are receptors) are 13 AADT • Development flows on Cocklaw Street east of the M90 ramp (i.e. where there are receptors) are 92 AADT (approximately 87 AADT of LDVs and 5 AADT of HDVs) • Development traffic entering the site access road turn into the development prior to the only receptor (Home Farm) on the site access road, which lies further south. The old Baxters building also provides a physical barrier between development traffic and the property. <p>There is no significant change to LDV flows on local roads with relevant receptors.</p>
<p>Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors (HDV = goods vehicles + buses >3.5t gross vehicle weight)</p> <p>A change of HDV flows of:</p> <ul style="list-style-type: none"> • More than 25 AADT within or adjacent to an AQMA • More than 100 AADT elsewhere 	<p>As above, there is no significant change to HDV flows on local roads with relevant receptors.</p>
<p>Realign roads i.e. changing the proximity of receptors to traffic lanes</p> <p>Where the change is 5m or more and the road is within an AQMA</p>	<p>There is no significant change in the proximity of receptors to traffic lanes. There may be some slight road widening of the B914 near to the site access road.</p>
<p>Introduce a new junction or remove an existing junction near to relevant receptors</p> <p>Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.</p>	<p>There may be a requirement to improve the existing simple priority junction for the site access road (from B914) via the introduction of a right turn ghost island. A new internal junction is being constructed within the site while no junction is being removed. These changes are not considered significant relevant the adjacent criterion.</p>
<p>Introduce or change a bus station</p> <p>Where bus flows will change by:</p> <ul style="list-style-type: none"> • More than 25 AADT within or adjacent to an AQMA • More than 100 AADT elsewhere 	<p>No new or modified bus stations are proposed.</p>
<p>Have an underground car park with extraction system</p> <p>The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car</p>	<p>No underground car park is proposed.</p>

³ Some additional/revised wording taken from IAQM's Land-use Planning & Development Control: Planning for Air Quality, not Fife Council Guidance. IAQM is the original author of the screening criteria.

Criterion ³	Status
<p>park having more than 100 movements per day (total in and out).</p> <p>Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. This includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.</p> <p>Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/s⁴ is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing NO₂ concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.</p>	<p>No combustion plant is proposed (electric boilers are to be used).</p>

Table 4: Assessment Type Criteria

6.0 Conclusion

Considering responses in the above, a **simple air quality assessment** is considered appropriate for this development. As there is a human receptor within 350m of the boundary of the site, this should include a construction dust impact assessment. This could be conditioned to planning consent as long as the assessment is completed prior to work commencing on site.

This memorandum report has been prepared by the following Mabbett personnel:

MABBETT & ASSOCIATES LTD



Michael Lynch, CEng, FIChemE, MIEEnvSc, MIAQM
Director, Engineering

This report has been reviewed and approved by the following Mabbett personnel:

MABBETT & ASSOCIATES LTD



Dr. Dan Colby, PhD
Principal Environmental Consultant

⁴ As a guide, the 5 mg/s criterion equates to a 450 kW ultra low NO_x gas boiler or a 30kW CHP unit operating at <95 mg/Nm³