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HIGHWAYS TECHNICAL NOTE

Author:	Paul Mew Associates
Date:	May 2020
Project:	P2300: Dunsfold Oil Well, High Loxley Road
Subject:	Highways Review of UKOG Planning Application to SCC

1.0 INTRODUCTION

1.1 Paul Mew Associates (PMA) is instructed to carry out a review of highways aspects relating to a planning application made by UK Oil and Gas Investments PLC (UKOG) for proposed exploratory mineral extraction on land south of Dunsfold Road and east of High Loxley Road, Dunsfold, Surrey.

1.2 The proposal, submitted to Surrey County Council (SCC) under planning reference 2019/0072 and validated in April 2019, comprises the following:

> *"The construction, operation and decommissioning of a well site for the exploration and appraisal of hydrocarbon minerals from one exploratory borehole (Loxley-1) and one side - track borehole (Loxley - 1z) for a temporary period of three years involving the siting of plant and equipment, the construction of a new access track, a new highway junction with High Loxley Road, highway improvements at the junction of High Loxley Road and Dunsfold Road and the erection of a boundary fence and entrance gates with restoration to agriculture."*

1.3 The local planning authority is Waverley Borough Council (WBC) whereas the local highway authority is SCC. The minerals planning authority is also SCC, therefore SCC will determine the planning application.

1.4 From a highways point of view the primary concerns relate to the impact of the proposal on traffic flow on the local and wider highway network, and the impact of the necessary

enabling works to accommodate the heavy commercial vehicles (HCV) on common land. This report assesses both issues as far as is practicable based on the information that has been submitted with the planning application. Principally these documents are:

- Transport Statement (TS) Loxley (April 2019) Parts 1 and 2;
- Loxley Well Site Supplementary Transport Statement (August 2019);
- Drawing ZG-UKOG-L1-PA-13 Proposed Access Layout Plan – High Loxley Road;
- Drawing ZG-UKOG-L1-PA-14 Proposed Access Layout Plan – Pratts Corner.

1.5 At the time of preparing this report the planning application is currently under consideration by SCC.

1.6 We are aware of a planning application for an alternative access to the site directly from Dunsfold Road which was submitted to SCC under planning reference 2019/0108 and was validated in July 2019. This application was withdrawn in March 2020.

1.7 We have briefly reviewed the latter planning application. It has been noticed that the vehicle to vehicle stopping sight distances (SSDs) contained in the supporting Transport Statement submitted with the planning application (drawing number LTP/3134/04/01/01/0) have been incorrectly plotted looking to the left, and achieving the required visibility splays may require more of the highway verge (which might be common land) to be cleared of trees and foliage. Notwithstanding, as the planning application has since been withdrawn no further analysis of this scheme has been carried out.

1.8 The following chapter provides an overview of the current planning application (2019/0072) regarding the impact of the proposal on traffic flow on the local and wider highway network. Chapter 3 assesses the impact of the necessary enabling works to accommodate the HCVs on common land.

2.0 IMPACT ON TRAFFIC FLOW

2.1 The site is located to the east of High Loxley Road, a single lane unclassified road that is subject to the national speed limit of 60 mph. The width of the carriageway along High Loxley Road is approximately 3.0m which is wide enough for single file traffic flow. The road is flanked on both sides by trees and hedgerows that form the boundary with adjacent agricultural land and common land.

2.2 High Loxley Road joins the classified road network at Dunsfold Road (B2130) via a priority junction with High Loxley Road. This, together with the adjacent Dunsfold Common Road junction with Dunsfold Road, is known locally as 'Pratts Corner'. Dunsfold Road is a two-way single carriageway and is also subject to the national speed limit of 60 mph. The width of the carriageway along Dunsfold Road is approximately 6.0m.

2.3 The TS submitted with the planning application states that all traffic associated with the proposed development will enter High Loxley Road via a left turn movement from B2130 Dunsfold Road and exit High Loxley Road via a right turn movement to B2130 Dunsfold Road. All traffic would therefore avoid The Green, Dunsfold, Loxhill, Hascombe, Busbridge, and Godalming (accessed via Dunsfold Road).

Summary of Proposed Highways Works

2.4 Appendix 2 of the TS submitted with the planning application provides details of the proposed highway works within High Loxley Road consisting of:

- The formation of a priority junction between High Loxley Road and the proposed access route into the site;
- Localised widening on the west side of High Loxley Road north of the proposed access to facilitate the swept paths of HCVs and Abnormal Indivisible Load Vehicles (AILVs) entering and exiting the site;
- Localised widening on the east side of High Loxley Road south of the proposed access to provide a passing place for vehicles travelling to properties south of the proposed highway access when vehicles travelling north on High Loxley Road are waiting at the proposed portable traffic signals; and

- Removal/reduction of a limited section of the existing hedgerow on the east side of High Loxley Road to allow both the construction of the proposed site access and to accommodate required visibility sightlines.

2.5 Appendix 3, 4, and 6 of the TS provides details of the proposed temporary 30 mph speed limit on the wider highway network, the proposed highway improvements at the High Loxley Road junction with Dunsfold Road, and the proposed portable traffic signals at the High Loxley Road and the Dunsfold Common Road junctions with Dunsfold Road respectively:

- The introduction of Portable Traffic Signal control equipment to separately control Dunsfold Road (East), Dunsfold Road (West), Dunsfold Common Road, High Loxley Road south of the proposed site access and the proposed site access;
- The use of Temporary Traffic Management to facilitate the operation of the temporary traffic signals pursuant to in 'An Introduction to the use of Portable Traffic Signals' (DfT, 2008) and 'Traffic Signs Manual' (DfT, 2009);
- The introduction of high friction anti-skid resistance surfacing on the approach to the temporary traffic signals on Dunsfold Road (East), Dunsfold Road (West) and Dunsfold Common Road pursuant to DMRB: CD236: 'Surface course materials for construction'; and
- A temporary 30 mph speed limit for the duration of the development on High Loxley Road, Dunsfold Road and Dunsfold Common Road on the approach to the 'Pratts Corner' junction.

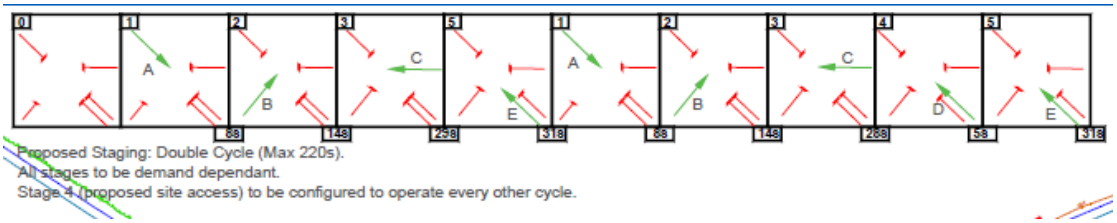
Impact on Traffic Flow

2.6 The main impact of the proposal on traffic flow adjoining the site is the planned temporary traffic signals at the Dunsfold Road (East), Dunsfold Road (West), Dunsfold Common Road, High Loxley Road junctions.

2.7 Appendix 8 of the submitted TS presents the results of a weekday AM and PM peak period (07:30-08:30 and 16:30-17:30 respectively) microsimulation 'Linsig' model of the planned 'temporary' traffic signals. It is noted that the proposal is for a three-year period, however presumably based on the outcome of the exploratory works the precedent would then be established for the traffic signals to be installed on a longer-term basis.

2.8 The primary concerns with the output of the traffic simulation model are that the planned signalisation of the junctions will result in a significant delay in the flow of traffic locally which does not currently exist. The significant delays that will be experienced by the current highway users will be as a result of a comparatively minimal number of vehicle trips that will be generated by the proposal.

2.9 The fundamental reason for the significant delay in the flow of traffic locally is the extremely inefficient layout of the junction. Owing to the large number of conflicting movements through the junction only one arm will have green time at any one time. The delay arises from the fact the signals are four-way and sequential. The proposed staging diagram for the portable signal system has been extracted from Appendix 6 of the Transport Statement submitted with the planning application:



2.10 Also, the distance between the stop line at each arm to a point clear of the junction is substantial which means that the inter-green period between each stage needs to be long enough to allow vehicles to safely pass through the junction. The total maximum cycle time for all stages of the signal system is 220 seconds.

2.11 This latter point is compounded by the fact that the planned stop line and signal head for High Loxley Road and the Loxley Site Access is set-back some 175 metres from the B2130 Dunsfold Road. The set-back is necessary owing to the narrow width of High Loxley Road making it capable of accommodating one-way traffic flow only.

2.12 The results of the Linsig model in respect to the 'mean max queue PCU' (passenger car unit) and the 'average delay per PCU' (seconds per PCU) is set out in the following tables as noted from Appendix 8 of the submitted TS. Figures 1 and 2 of this report provide a broad illustration of the queuing and where the delays will be experienced:

Junction Arm	AM PEAK 07:30-08:30			
	Average Time Delay		Mean Max. Queue	
	(s/pcu)	Minutes	(pcu)	Metres
Dunsfold Road (W)	47.4	0.8	13.5	78
Dunsfold Common Road	72.6	1.2	6.3	36
Site Access	909.1	15	3.8	22
Dunsfold Road (E)	43.8	0.7	17.7	102
High Loxley Road	743.6	12.4	0.4	2

2.13 In the weekday AM peak the signalisation of the junctions will result in a mean maximum queue of 13.5 PCUs on the Dunsfold Road west arm of the junction, and 17.7 PCUs on the Dunsfold Road east arm of the junction. These arms of the road network currently have no queuing at all as they are free-flowing lanes of traffic. These queues will extend for around 78 metres and 102 metres respectively when applying the widely regarded PCU length of 5.75 metres.

2.14 It should also be noted that these are 'mean' maximum queues and therefore the actual maximum queues will be greater. It is widely regarded in traffic microsimulation modelling that it is expected that in 50% of cycles the maximum queue in real life will exceed the average queue calculated in a simulation model.

2.15 The other significant point of note is the average time delay for the Loxley Site Access and for High Loxley Road. The Loxley Site Access will have an average delay of 15 minutes per PCU in the AM peak period, and the High Loxley Road arm will have an average delay of 12.4 minutes per PCU. These are substantial delays to the users of these arms of the junction, and whilst the Loxley Site Access is a private access the High Loxley Road arm is part of the public highway and provides access to the other properties to the south of the junction including an agricultural farm and High Billinghurst Farm which is also an events venue for weddings, private parties, and corporate events.

Junction Arm	PM PEAK 16:30-17:30			
	Average Time Delay		Mean Max. Queue	
	(s/pcu)	Minutes	(pcu)	Metres
Dunsfold Road (W)	70.4	1.2	14.5	83
Dunsfold Common Road	67.2	1.1	16.6	95
Site Access	940	15.7	3.4	20
Dunsfold Road (E)	57.5	1	25.2	145
High Loxley Road	770.7	12.8	1.1	6

2.16 The weekday PM peak exhibits similar results to the AM peak. The signalisation of the junctions will result in a mean maximum queue of 14.5 PCUs on the Dunsfold Road west arm of the junction, and 25.2 PCUs on the Dunsfold Road east arm of the junction. As discussed, these arms of the road network currently have no queuing at all as they are free-flowing lanes of traffic. These queues will extend for around 83 metres and 145 metres respectively when applying the widely regarded PCU length of 5.75 metres.

2.17 The Loxley Site Access will have an average delay of 15.7 minutes per PCU in the PM peak period, and the High Loxley Road arm will have an average delay of 12.8 minutes per PCU. Again these are substantial delays to the users of these arms of the junction, and whilst the Loxley Site Access as said is a private access the High Loxley Road arm is part of the public highway and provides access to the other properties to the south of the junction including an agricultural farm and High Billinghurst Farm which is also an events venue for weddings, private parties, and corporate events.

2.18 No assessment has been made of the impacts of the planned signalisation of the junction on the operations of the other users of High Loxley Road, the most significant trip generator of which is the event venue High Billinghurst Farm. On an event day there could be up to 150 guests plus staff accessing the site. Currently the venue is restricted to 30 events per calendar year, however a Section 73 application has been submitted to WBC to vary the condition to allow 50 events per calendar year.

2.19 The significant delay to the High Loxley Road arm of the planned signal control system would have a significant detrimental impact to the viability of the existing events venue.

2.20 It is also noted that High Loxley Road provides an alternative 'emergency' access to Dunsfold Aerodrome. No assessment has been made of the impact of the proposal on this existing emergency access route.

Planned Temporary 30 mph Speed Limit

2.21 As set out herein, the applicant has proposed a temporary 30 mph speed limit for the duration of the development on High Loxley Road, Dunsfold Road and Dunsfold Common Road on the approach to the 'Pratts Corner' junction.

2.22 There is inherent uncertainty that a 30 mph speed limit can be relied upon. A speed limit requires a traffic regulation order (TRO) that is subject to public consultation/public inquiry.

Summary

2.23 To summarise, the planned signalisation of the Dunsfold Road junctions with Dunsfold Common Road, High Loxley Road and the incorporation of the Loxley Site Access into the signal system for an initial three year period will have a substantial detrimental effect in respect to the free-flow of traffic on the adjoining highway, to the local environment, and to neighbouring amenity.

2.24 The signalisation of the junctions will be extremely inefficient and will cause a substantial amount of delay where there is currently little to no delay. The significant amount of queueing and stationary or slow-moving traffic created by the planned junction arrangement will have an environmental impact in respect to an increase in emissions and a resultant impact on air quality locally.

2.25 The extremely long delay that will be experienced by traffic exiting High Loxley Road onto Dunsfold Road is of potentially critical concern to the existing established farms and events venue to the south of the site. No assessment has been made of the impacts of the proposal in this respect.

2.26 It is also unclear whether the applicant has engaged with Dunsfold Aerodrome regarding the impacts of the scheme on the emergency access to the airfield via High Loxley Road. There is also uncertainty that the planned temporary 30 mph speed limit can be implemented.

3.0 IMPACTS ON COMMON LAND

3.1 A scheme of road widening is proposed at certain key points to accommodate the ingress and egress manoeuvres of HCVs and AILVs accessing the site under the proposals. The works are summarised below and illustrated on plans at Appendices 2 and 4 of the TS submitted with the planning application:

- The formation of a priority junction between High Loxley Road and the proposed access route into the site;
- Localised widening on the west side of High Loxley Road north of the proposed access to facilitate the swept paths of HCVs and Abnormal Indivisible Load Vehicles (AILVs) entering and exiting the site;
- Localised widening on the east side of High Loxley Road south of the proposed access to provide a passing place for vehicles travelling to properties south of the proposed highway access when vehicles travelling north on High Loxley Road are waiting at the proposed portable traffic signals; and
- Removal/reduction of a limited section of the existing hedgerow on the east side of High Loxley Road to allow both the construction of the proposed site access and to accommodate required visibility sightlines.

3.2 According to the TS, "in all cases the maximum amount of widening is 0.91m to ensure that the proposed highway works are within the extents of the adopted pubic highway".

3.3 In order to check the veracity of the aforemtioned statement we have carried out a vehicle tracking exercise. The results are presented in Figures 3 and 4 of this report. We have carried out a swept path analysis of a large articulated low-loader with non-steering trailer axles entering and exiting High Loxley Road from Dunsfold Road.

3.4 The results demonstrate that the amount of road widening to accommodate the vehicle track (excluding body overhang) does remain within 0.91m at any one point. However the body overhang does exceed 0.91m encroachment across common land in places, and whilst the body overhang does not require an increase in carriageway width, it still impacts on common land to the point that vegetation would need to be cut-back and maintained as such. Appendix 4 of the submitted TS (drawing reference LTP/3134/03/04/01/B) sets out the extent of encroachment (wheel track and body overhang) by HGVs and AILVs.

3.5 The TS submitted with the planning application does not include a swept path assessment for the full stretch of High Loxley Road between Dunsfold Road and the Loxley Site Access. We have assessed an additional section of High Loxley Road where the carriageway is narrow and the road bends adjacent to the sub-station. It would appear that an additional amount of widening is necessary to stop the vehicle wheel track from overunning the soft verge. Refer to Figures 3 and 4 of this report.

3.6 The proposed traffic signalisation of the adjacent junctions means that vehicle to vehicle sightlines from the High Loxley Road junction with Dunsfold Road are not required, therefore the requirement for large-scale cutting back of vegetation on the highway verge is not necessary. However, for the reasons set out in Chapter 2, we do not consider that the signalisation of the junction is reasonable, proportionate, or justified.

4.0 SUMMARY

4.1 To summarise, we are instructed to carry out a review of highways aspects relating to a planning application made by UK Oil and Gas Investments PLC (UKOG) for proposed exploratory mineral extraction on land south of Dunsfold Road and east of High Loxley Road, Dunsfold, Surrey.

4.2 The planned signalisation of the Dunsfold Road junctions with Dunsfold Common Road, High Loxley Road and the incorporation of the Loxley Site Access into the signal system for an initial three year period will have a substantial detrimental effect in respect to the free-flow of traffic on the adjoining highway, to the local environment, and to neighbouring amenity.

4.3 The signalisation of the junctions will be extremely inefficient and will cause a substantial amount of delay where there is currently little to no delay. The significant amount of queueing and stationary or slow-moving traffic created by the planned junction arrangement will have an environmental impact in respect to an increase in emissions and a resultant impact on air quality locally.

4.4 The extremely long delay that will be experienced by traffic exiting High Loxley Road onto Dunsfold Road is of potentially critical concern to the existing established farms and events venue to the south of the site.

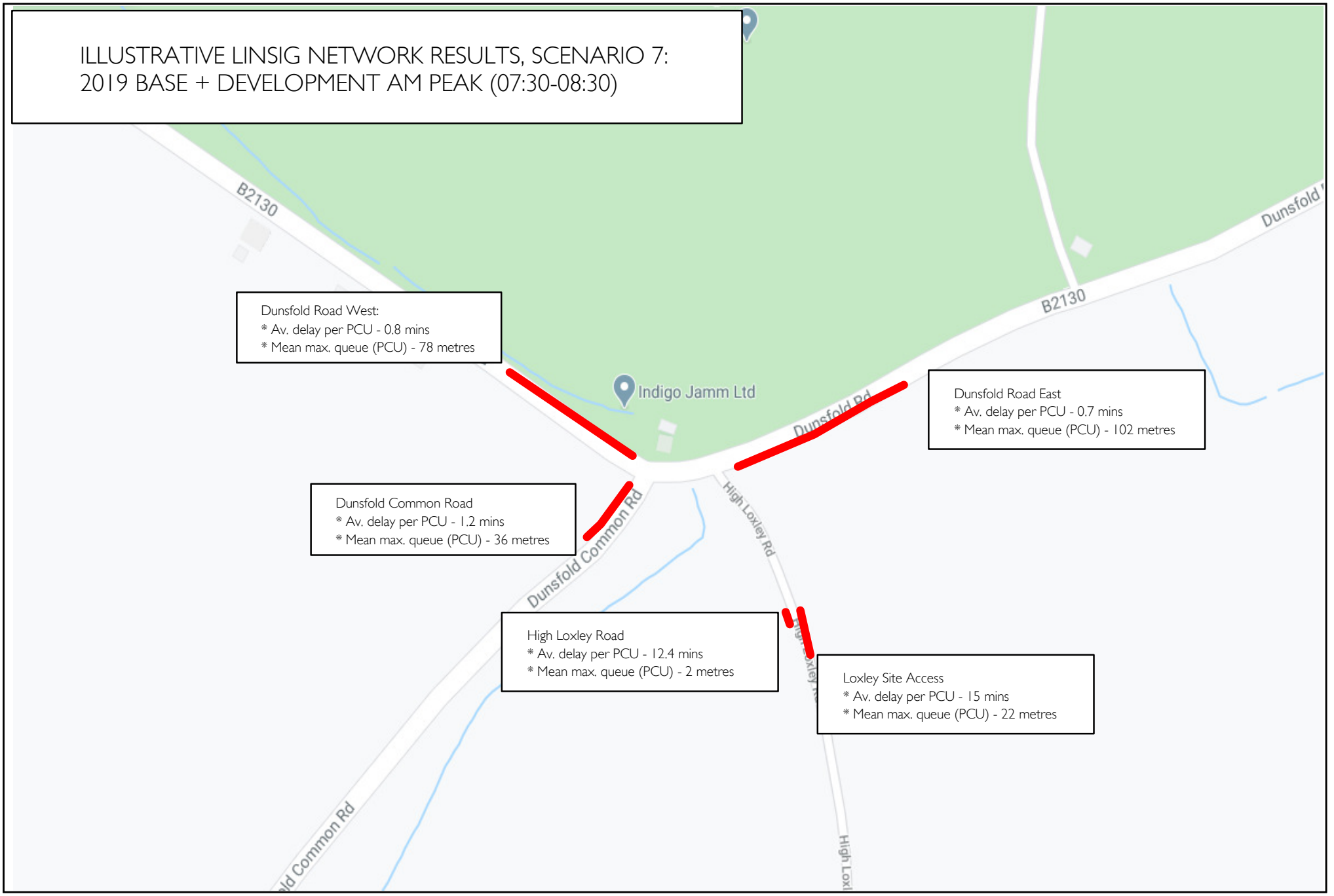
4.5 No assessment has been made of the impacts of the proposal in respect of neighbouring businesses/occupiers on High Loxley Road, and it is also unclear whether the applicant has engaged with Dunsfold Aerodrome regarding the impacts of the scheme on the emergency access to the airfield via High Loxley Road.

4.6 There is also uncertainty that the planned temporary 30 mph speed limit for the duration of the development can be implemented.

4.7 Based on our assessment of a swept path analysis for large articualted low-loaders entering and exiting High Loxley Road from Dunsfold Road, we are reasonably content that the amount of road widening to accommodate the vehicle track (excluding body overhang) does remain wihtin 0.91m at any one point as put forward by the applicant.

4.8 However the body overhang does exceed 0.91m encroachment across common land in places, and whilst the body overhang does not require an increase in carriageway width, it still impacts on common land to the point that vegetation would need to be cut-back and maintained as such throughout the planned initial three year period.

FIGURES



Date: 20-March-2020
Scale: NTS
Source: Google Maps
Drawing No: P2300/TN/01

N

P2300: OIL WELL DUNSFOLD

Figure 1.

Illustrative Impact of Proposed Traffic Signals (Delay and Queues) in the AM Peak

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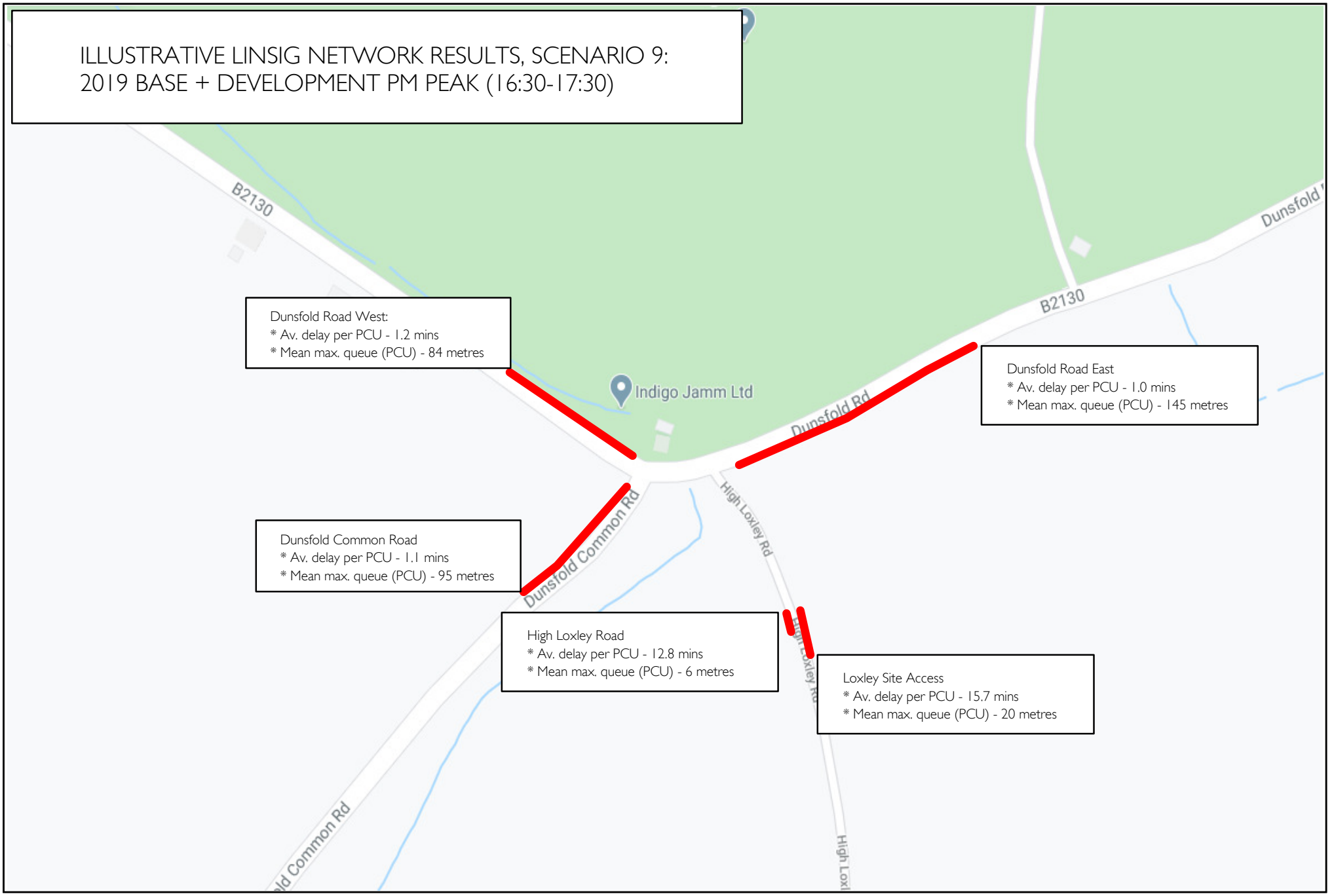

Date: 20-March-2020
Scale: NTS
Source: Google Maps
Drawing No: P2300/TN/02

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P2300: OIL WELL DUNSFOLD

Figure 2.

Illustrative Impact of Proposed Traffic Signals (Delay and Queues) in the PM Peak

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Gate House

66.2m

Low Loader

BUNSFIELD ROAD

Enroachment onto common land by around 1.0 metres (including body overhang)

Stone

HIGH LOXLEY ROAD

65.0m

Enroachment onto common land by around 1.2 metres (including body overhang)

Area of additional wheel track overrun

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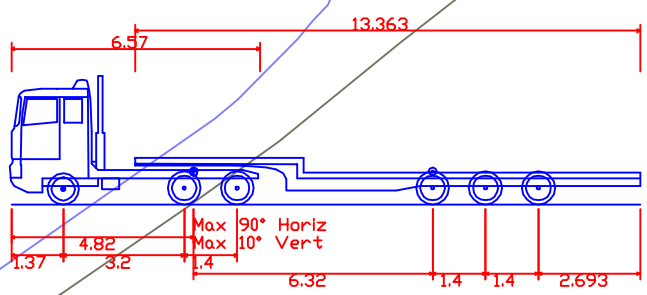

Low Loader	
Overall Length	16.633m
Overall Width	2.500m
Overall Body Height	3.396m
Min Body Ground Clearance	0.320m
Max Track Width	2.500m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	6.790m

Date: 20-March-2020
Scale: 1:200@A3
Source: OS/AutoTrack
Drawing No. P2300/TN/3

N

P2300: OIL WELL, LOXLEY

Figure 3.

Swept Path Analysis; Low-Loader Enter High Loxley Rd

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Gate House

Enroachment onto common land by around 0.775 metres (including body overhang)

DUNSFOLD ROAD

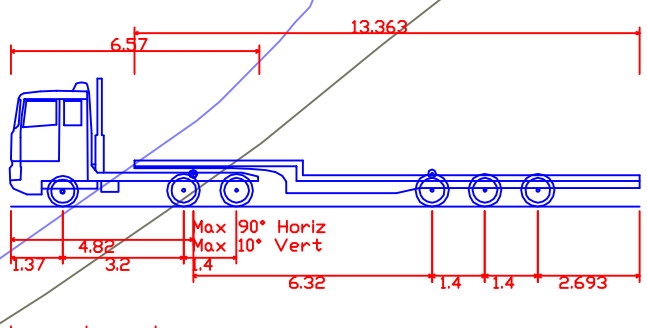
66.2m

Stone

HIGH LOXLEY ROAD

65.0m

Area of additional wheel track overrun



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Date: 20-March-2020
Scale: 1:200@A3
Source: OS/AutoTrack
Drawing No. P2300/TN/4

N

P2300: OIL WELL, LOXLEY

Figure 4

Swept Path Analysis; Low-Loader Exit High Loxley Rd

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