## CUADRILLA RESOURCES LIMITED



#### APPENDIX - F

# TRANSPORT ASSESSMENT & HIGHWAY STAGE 1 SAFETY AUDIT

Cuadrilla Resources Limited January 2010

# **DMMason**

Engineering Consultants Ltd

#### **CUADRILLA RESOURCES LIMITED**

#### HYDROCARBON EXPLORATION SITE: LOWER STUMBLE

TRANSPORT ASSESSMENT

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#### **CUADRILLA RESOURCES LIMITED**

#### HYDROCARBON EXPLORATION SITE: LOWER STUMBLE

#### TRANSPORT ASSESSMENT

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Reference: DMM/AJB/M.035

January 2010

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#### 1.0 <u>INTRODUCTION</u>

- 1.1 D M Mason Engineering Consultants Ltd has been instructed by Cuadrilla Resources Limited to prepare a Transport Assessment in support of the planning application for hydrocarbon exploration drilling off the B2036 London Road, Lower Stumble, West Sussex.
- 1.2 This Transport Assessment describes the site and its access from the B2036 London Road. It describes the proposed works and the traffic flows arising from the works. The Assessment reports on accidents on roads adjacent to the site.

# 2.0 <u>DESCRIPTION OF THE APPLICATION SITE AND THE ADJACENT</u> ROAD NETWORK

- 2.1 The application site lies to the east of London Road, Lower Stumble and to the south of Balcombe village. The site lies in on a previous site of hydrocarbon exploration. A Location Plan, drawing M.035/1, an extract from the 1:50,000 Scale Ordnance Survey Mapping is given in Appendix 1. A Red-Line Plan, Figure 01 is given in Appendix 2.
- 2.2 The application site is a former exploration drilling site. The site retains the drilling platform and access. The site is presently used for forestry activities. A Proposed Layout and Existing Contour Plans, Drawing CRL-001 by Fox (Owmby) Ltd is given in Appendix 3.
- 2.3 The site is accessed from London Road through a verge crossing and gateway. Visibility splays of 2.4 metres by greater than 215 metres looking to the north and 2.4 metres by tangential looking to the south are available. The visibility splay to the south allows for visibility toward on-coming vehicles of 215 metres subject to the trimming of vegetation overhanging the verge.
- 2.4 The B2036 London Road runs between Horley to the north and Cuckfield to the south. To the north of the site it crosses the M23 at junction 10A. It is generally undeveloped outside the urban areas.
- 2.5 Within Balcombe, London Road has a 30 mile per hour speed limit with frontage access dwellings. Balcombe Primary School lies on the on the west side of London Road. A 20 mile per hour speed limit during school start and finish times is signed adjacent to the school. Access to Balcombe station is taken from London Road.

#### 3.0 <u>DESCRIPTION OF THE APPLICATION PROPOSALS</u>

3.1 The proposals involve the drilling of an hydrocarbon exploration well. The planning application which this Transport Assessment supports is solely for the drilling of the exploration well. Any future use of the site should the well prove exploitable reserves will be the subject of a separate planning application.

3.2 Exploration drilling consists of five separate operations. These are:-

Refurbishment of the drilling site 2 weeks

Erection of the drilling rig 4 days

Drilling 3 to 5 weeks

Removal of the drilling rig 4 days

Testing 2 to 4 weeks

#### 4.0 TRAFFIC GENERATION

4.1 As noted in Section 3, the proposals involve five discrete phases. Details of traffic movements are given in Appendix 4.

#### Refurbishment of the Drilling Site

- 4.2 The existing site access is adequate for the proposed purposes.
- 4.3 The drilling will be undertaken from the existing platform constructed of course aggregates. The platform will be refurbished prior to drilling. The refurbishment is undertaken using typical heavy civil engineering plant causing four heavy goods vehicle movements. Site refurbishment takes about two weeks.
- 4.4 The platform will be refurbished during a two weeks period. Three inbound and three outbound heavy goods vehicle movements per day arise from this work with about 30 inbound and 30 outbound movements in total. Four daily movements for plant operators arise during this period.
- 4.5 Upon completion of the refurbishment, the civil engineering plant is removed causing four heavy goods vehicle movements.

#### **Erection of the Drilling Rig**

- 4.6 The drilling rig is erected in four days. Erection is undertaken using a team of about 15 erectors, generation about 30 light vehicle movements on each of the four days.
- 4.7 The rig and associated equipment arrives during the four days, generating a maximum of ten inbound and ten outbound heavy goods vehicle movements per day.

  Most movements are by articulated vehicles.

#### **Drilling**

- 4.8 Immediately prior to the start of drilling on the last day of rig erection and for the first five days of drilling, up to 15 inbound and 15 outbound heavy goods vehicle movements arise from the delivery of drill pipes, mud and other equipment.
- 4.9 During drilling, heavy goods vehicle movements are at a maximum of five inbound and five outbound per day.
- 4.10 Drill operatives work 12 hour shifts changing at 07.00 and 19.00. Approximately 30 light vehicle movements per day arise from operative movements.

#### Removal of the Drilling Rig

- 4.11 The drilling rig is dismantled in four days. Dismantling is undertaken using a team of about 15 erectors, generating about 30 light vehicle movements on each of the four days.
- 4.12 The rig and associated equipment departs during the four days, generating a maximum of ten inbound and ten outbound heavy goods vehicle movements per day.

  Most movements are by articulated vehicles.

#### **Testing**

4.13 Testing involves the removal of oil by tanker for off-site analysis. Two tanker loads of oil per day are removed for this purpose. Personnel undertaking the work travel to the site daily by light vehicle.

#### **Maximum Generated Flows**

4.14 The maximum daily generated two-way flows during each of the phases of use of the site are therefore:-

Phase	Heavy Vehicles	Light Vehicles
Refurbishment of the drilling site	6	4
Erection of the drilling rig	20	30
Drilling: first 5 days	30	30
Drilling: remaining period	0 to 10	30
Removal of the drilling rig	20	30
Testing	4	2

#### ACCESS TO THE SITE

5.0

- 5.1 The site access is a verge crossing surfaced with unbound material. The access has a gateway of 4.2 metres set-back from the carriageway edge by 11.5 metres. The access has visibility splays of 2.4 metres by 215 metres looking to the right and 2.4 metre by tangential looking to the left. The visibility splay to the south allows for visibility toward on-coming vehicles of 215 metres subject to the trimming of vegetation overhanging the verge. The visibility splays at the access meet standards and are adequate.
- 5.2 It is proposed that all drilling related heavy goods vehicle traffic travel to and from the site using the B2036 from the M23 Junction 10A. Vehicles travelling to the site to/from the south will U-turn at junction 10 on the M23. An Area Location/Vehicle Route Plan, Figure 03 is given in Appendix 5. Aggregates for the site refurbishment will travel by the shortest route to the site.
- 5.3 The proposed site access route from the M23 passes through Balcombe village, passing the village school. Movements by heavy goods vehicles to the site will be timed so that none are undertaken during the morning and afternoon school start and finish periods.
- The use of the existing drilling site platform reduces the flow of construction traffic to the site. Construction of the drilling site platform would normally require the delivery of materials generating 220 trips to the site and 220 empty trips from the site. The use of the existing platform therefore reduces heavy goods vehicle flows to the site by 380 movements.

#### 6.0 ACCIDENT DATA

- Accident data has been obtained from Sussex Police for the period 1 June, 2004 to 31 May, 2009. The study period is therefore five years. The study length is London Road between the M23 junction 10A and the site access.
- During the study period 33 accidents were recorded. Two fatal accidents caused four injuries, three serious accidents caused six injuries and 28 slight accidents caused 38 injuries.
- A fatal accident occurred close to the Whiteley Hill junction, 800 metres north of the B2110 Paddockhurst Road junction. A vehicles is believed to have swerved to avoid an animal carcass in the carriageway. The vehicle struck a tree.
- A fatal accident occurred 476 metres south of the Stoney Lane junction. A vehicle driven by a minor left the road whilst travelling at speed.
- 6.5 Four accidents occurred on the B2036 between the M23 junction 10A northbound on-sliproad and the southbound off-sliproad. Four slight injuries occurred. One accident involved a poor turn from an hotel entrance, one accident involved a shunt of a vehicle waiting to turn right into a minor road, one accident involved a U-turn manoeuvre. The remaining accident occurred when the Police attempted to stop a fugitive vehicle.

- 6.6 Five accidents occurred on the B2036 south of the M23 junction 10A and north of the Paddockhurst Road junction. The fatal accident noted above is included in this total. The remaining accidents caused six slight injuries. One accident was caused by medical problems. One accident was caused when the Police stopped a fugitive vehicle. Two accidents were caused by shunts of a vehicles waiting to turn.
- 6.7 Five accidents causing five slight injuries occurred at the B2036/B2110 Paddockhurst Road junction. Three accidents were shunts of queuing vehicles. Two accidents were turns from the minor road across the path of on-coming vehicles.
- One accident causing one slight injury occurred between the B2110 Paddockhurst Road junction and the B2110 High Street junction. This accident was alcohol related.
- 6.9 Six accidents occurred at the B2036/B2110 High Street junction. Three serious and seven slight injuries were caused. Two accidents were caused by shunts of vehicles waiting to turn right onto the minor road. Four accidents involved vehicles turning across the path of on-coming vehicles.
- 6.10 Five accidents occurred on the B2036 between the B2110 High Street and the Handcross Road junctions. One accident was fatal and is referred to above. The remaining accidents caused five slight injuries. One accident involved a vehicle turning right into a private drive being struck by an overtaking motorcycle. One accident involved an intoxicated driver striking parked vehicles. One involved a vehicle moving to the nearside verge and being impeded by soft material. One involved the shunt of a queuing vehicle.

- Two accidents occurred at the B2036/Handcross Road junction causing six slight injuries. One accident involved a vehicle leaving the minor road across the path of an on-coming vehicle. The other accident involved a vehicle loosing control and striking street furniture.
- Two accidents occurred at the B2036/Westrup Road/Haywards Heath Road junction.

  Three slight injuries occurred. One accident involved a shunt of a queuing vehicle.

  The other accident involved a vehicle entering a mini-roundabout into the path of a turning vehicle.
- Three accidents occurred on the B2036 between the railway bridge and the Kemps House access. One accident causing serious injury involved a passenger falling from a moving bus. The two remaining accidents were caused by loss of control at speed causing two serious and one slight injury.
- 6.14 It will be noted from the above that there were few accidents within Balcombe village and that there were no pedestrian accidents.
- 6.15 The record indicates that a predominant feature of accidents on the B2036 was excessive speed. A number of accidents at junction may have been caused by poor visibility or excessive speed.
- 6.16 West Sussex County Council have recently completed works at the B2036/B2110 High Street junction. These works involve signing and road markings to improve visibility of the junction. The impact of these works will not be reflected in the above accident data.

- 6.17 It is understood that Balcombe Parish Council is proposing to install traffic calming measures in the village. The nature of these works is not presently finalised.
- 6.18 The County Council has not identified any further works on the B2036 and must therefore be content that the accident record does not warrant further work at this time.

#### 7.0 <u>CONCLUSIONS</u>

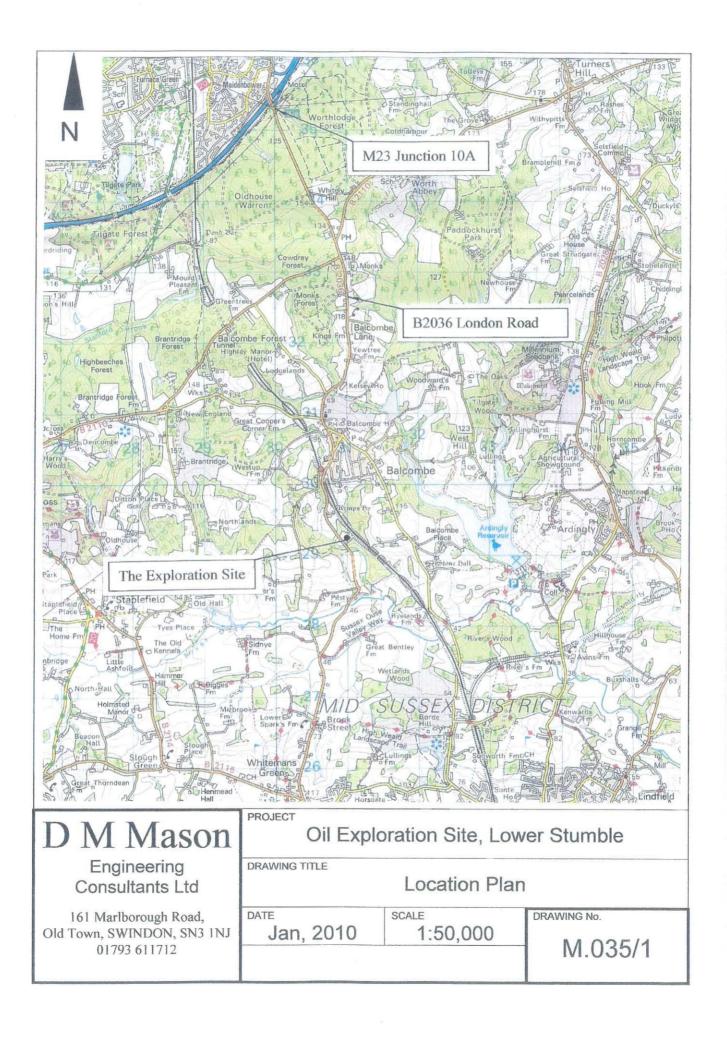
- 7.1 D M Mason Engineering Consultants Ltd has been instructed by Cuadrilla Resources Limited to prepare a Transport Assessment in support of the planning application for hydrocarbon exploration drilling off the B2036 London Road, Lower Stumble, West Sussex.
- 7.2 The planning application which this Transport Assessment supports is solely for the drilling of the exploration well. Any future use of the site should the well prove exploitable reserves will be the subject of a separate planning application.
- 7.3 The application site lies to the east of London Road, Lower Stumble and to the south of Balcombe village. The site lies in on a previous site of hydrocarbon exploration. The site retains the drilling platform and access. The site is presently used for forestry activities. The site is accessed from London Road through a verge crossing and gateway.
- 7.4 Exploration drilling consists of five separate operations: refurbishment of the drilling site, erection of the drilling rig, drilling, removal of the drilling rig and testing. The maximum daily generated two-way flows during the busiest phases of use of the site generates about 30 heavy goods vehicle and 30 light vehicle movements. This phase lasts for one week at the start of drilling.
- 7.5 The site access is a verge crossing surfaced with unbound material. The access has a gateway of 4.2 metres set-back from the carriageway edge by 11.5 metres. The access has adequate visibility splays.

- 1.6 It is proposed that all drilling related heavy goods vehicle traffic travel to and from the site using the B2036 from the M23 Junction 10A. Vehicles travelling to the site to/from the south will U-turn at junction 10 on the M23. Aggregates for the site refurbishment will travel by the shortest route to the site. Movements by heavy goods vehicles through Balcombe village will be timed so that none are undertaken during the morning and afternoon school start and finish periods.
- 7.7 Five years accident data has been obtained from Sussex Police. West Sussex County Council have recently completed works at the B2036/B2110 High Street junction. These works involve signing and road markings to improve visibility of the junction. It is understood that Balcombe Parish Council is proposing to install traffic calming measures in the village. The County Council has not identified any further works on the B2036 and must therefore be content that the accident record does not warrant further work at this time.
- 7.8 The site access is adequate for the proposed uses. It is proposed that the site be accessed by heavy goods vehicles at times which respect movements to the local school. There is no highway reason to refuse permission for the proposed application.

#### Appendix 1

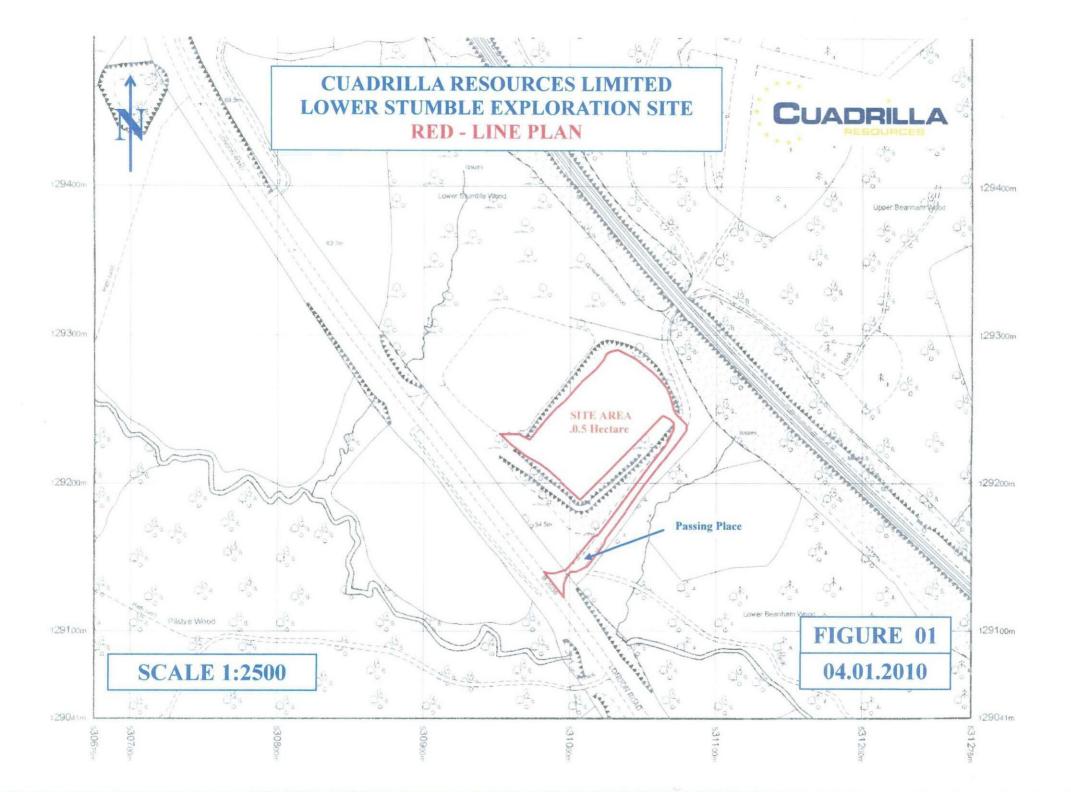
Drawing M.035/1, Location Plan, Extract

from the 1:50,000 Scale Ordnance Survey Map.



Appendix 2

Red-Line Plan, Figure 01.



# Appendix 3 Proposed Layout and Existing Contour Plans, Drawing CRL-001 by Fox (Owmby) Ltd.



Appendix 4

Vehicle Movements.

#### **OIL EXPLORATION SITE, LOWER STUMBLE**

#### **Approximate Vehicle Movements During Refurbishement**

# REFURBISHMENT START-UP MACHINERY MOBILISATION: 1-2 DAYS REFURBISHMENT: 2 WEEKS

Multiply approx numbers x (2) for total number of movements

Plant/ Vehicle Type	Approx No.	Туре	Activity/Use
Day 1	1	HGV	45 ft step trailer abnormal loads bringing 1 x 24 tonne 360 degree excavator plus diesel tank.
Day 1	1-2	Car/vans	Personnel
Day 1	1	HGV	20 tonne max bringing 1-2 x cabins mess/toilet and lock-up.
During week 1	1	HGV	45 ft step trailer abnormal loads bringing a heavy roller and a 10 tonne bulldozer.
During week 1-2	30 3 per day	HGV	20 tonne loads of road stone
During week 1-2	1-2 per day	Car/vans	Personnel
During Week 2	1	HGV	45 ft step trailer abnormal loads removing 1 x 24 tonne 360 degree excavator plus diesel tank.
	1	HGV	45 ft step trailer abnormal loads removing a heavy roller and a 10 tonne bulldozer.

#### Approximate Vehicle Movements During Erection of Drilling Rig

#### DRILLING RIG & ASSOCIATED MACHINERY MOBILISATION & SET UP: 2-4 DAYS

Multiply numbers x (2) for total number of movements

No	Plant/Load Description	Weight (Tonnes)	Load Dimensions (Metres)			Trailer Type
			L W		Н	-
Day 1						
1	Crane	25-45				40FT
2	Cat Walk Extension	20	12.19	2.60	3.00	40FT
3	4½" Pipe Bin + 2 x Pipe Rack	27	12.19	2.60	2.50	40FT
4	4½" Pipe Bin	27	12.19	2.60	3.20	40FT
5	4½" Pipe Bin	25	12.19	2.60	2.50	40FT
6	Deck Annular BOP + Trip Tank	25	12.19	2.92	3.35	Low Loader
7	Dog Hut, Junk Bin & Choke	20	12.19	2.74	2.90	40FT
8	Rig Pads	24	12.19	2.95	2.70	40FT
9	F.B.G	25	12.19	2.60	2.50	40FT
10	F.B.G	25	12.19	2.60	2.50	40FT
Day 2						
11	Shaker Tank	25	12.19	2.86	3.16	40FT
12	Suction Tank	25	12.19	2.86	3.16	40FT
13	Mix Tank	25	13.10	2.60	2.80	40FT
14	Rig Ramp	24	12.19	2.95	2.70	40FT
15	Koomey	24	10.30	3.28	3.08	40FT
16	Camp & Ram BOP	24	10.00	2.55	2.61	40FT
17	Fuel, Pump & Screen Stores	25	12.19	2.60	2.70	40FT ADR
18	Stores & 2 Square Tanks	25	12.19	2.60	2.70	40FT T/L

Day 3						
19	Fitters & Round Water Tanks	25	12.19	2.60	2.70	40FT T/L
20	RIG	50	18.19	1.17	4.26	Self Prop
21	4¾" D.C & 6¼" D.C	25	12.19	2.60	2.00	40FT
22	5" HW & 2 Pipe Racks Kelly +6 x 61/4" D.C	25	12.19	2.60	2.00	40FT
23	PZ9 Pump No 2	20	6.00	3.06	2.54	T/Axle
24	PZ9 Engine No 2	20	9.40	2.80	3.40	Low Loader
25	PZ9 Pump No 1	20	6.00	3.06	2.54	T/Axle
26	PZ9 Engine No 1	20	9.40	2.80	3.40	Low Loader
27	PZ9 Lift Beam Pump Suctions	20	12.19	2.95	2.50	40FT
Day 4	8		d.			
28	Logging Unit and BDF Stores					
29	Containers	25	12.19	2.60	2.50	40FT T/L
30	Fire Water Tank	16	9.50	2.75	3.35	Low Loader
31	Office ECT	18	9.70	2.60	3.12	45FT
32	Canteen & Drying Room	16	12.19	2.73	2.60	40FT T/L
33	3 x Hired Generators and Fuel Tanks	20	12.19	2.60	2.60	40FT
34	Forklift Truck and Shower Cabin	20	12.19	2.60	2.80	45FT

During day (4) there would be an additional 10–15 HGV loads delivering consumable such as drill pipe, drilling mud, casing, water, skips etc.

During the rig set up i.e days 1-4 there would be 10-15 light van and car visits per day.

#### Approximate Vehicle Movements During Drilling

#### DRILLING

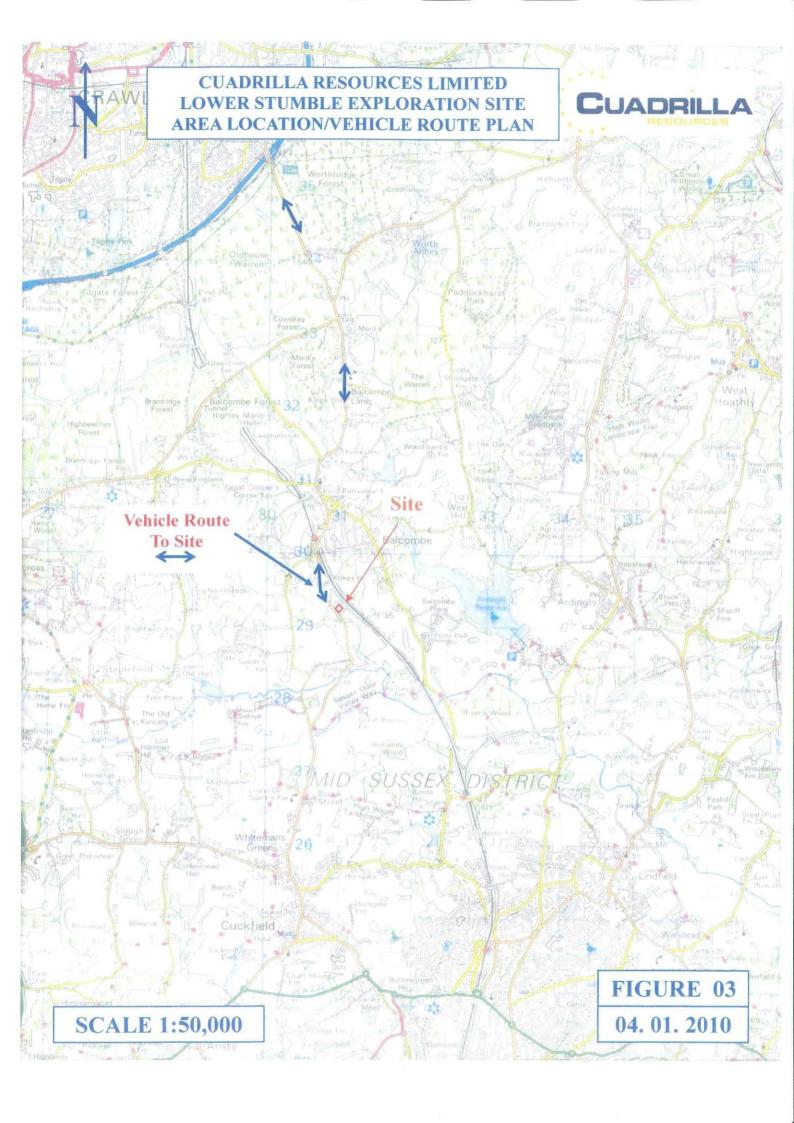
For the first (5) days there would be 10–15 HGV loads delivering consumable such as drill pipe, drilling mud, casing, water, skips etc.

After the first (5) days of drilling the HGV deliveries range from none up to 3-5 per day.

Once drilling starts on day (5) the light van and car visits increases to cover the 12 hour shift changes to 15-25 visits per 24hours.

#### Appendix 5

Area Location/Vehicle Route Plan, Figure 03.



# "LOWER STUMBLE DRILLING SITE" B2036 BALCOMBE ROAD, WEST SUSSEX

### PROPOSED SITE ACCESS WORKS

Road Safety Audit Stage 1 - Preliminary Design

January 2010

#### 1. INTRODUCTION

- 1.1 This report describes the results of a Stage 1 Preliminary Design Road Safety Audit, carried out on the proposed works at the east side of the B2036 Balcombe Road, Balcombe, West Sussex, in connection with proposed access arrangements to the Lower Stumble Drilling Site. The Safety Audit was carried out at the request of Phil Mason, Planning Consultant, The Cottage, Glebefields, Woodseaves, Stafford, Staffordshire, ST20 0LA, on behalf of Cuadrilla Resources Limited.
- 1.2 The object of this audit is to identify any existing safety related problems that may be exacerbated or any new problems that may be introduced, by the proposed works. No details of any recorded accidents were available.
- 1.3 The audit team comprised Ted Smith and Martin Brownsey, Senior Highways Engineers specialising in Highway Safety and Traffic Engineering, who have operated independently of the design team responsible for the scheme and had no involvement with the design of the proposals.
- 1.4 The procedures followed by the audit are as described in the Highways Agency's Design Standard 'HD 19/03' (DMRB Volume 5: Section 2, Part 2). The Audit has examined and reported only on the road safety implications of the scheme as presented in the drawing listed in the Appendix to this report, and has not examined or verified compliance of the design with any other criteria or standard.
- 1.5 This audit was carried out during May and December 2009, comprising of an examination of the documents listed in Appendix A. An initial site inspection was carried out during the morning of Wednesday 20<sup>th</sup> May 2009, with a subsequent inspection being carried out on the morning of Thursday 17<sup>th</sup> December 2009 in respect of the current design. At both occasions it was clear with damp road surface conditions, with light to moderate traffic flows. No pedestrians or cyclists were seen.

# 2. RESULTS FROM THIS STAGE 1 ROAD SAFETY AUDIT.

#### 2.1 COMMENT

No Relaxations or Departures from Standards were reported by the Designer.

#### 2.2 PROBLEM

Location: B2036 Balcombe Road, at the approaches to the site access.

Summary: Warning of the access junction and heavy goods vehicle movements.

Since this access is proposed on a long straight section of rural single carriageway road with a bend south of the proposed access, 'through' moving drivers may not clearly perceive the access and/or the possibility of slow moving heavy goods vehicles turning to enter and leave the site access.

#### RECOMMENDATION

As part of the access works, temporary back to back signing to TSRGD Diagram 7305 opposite the junction, combined with advance warning signing to TSRGD Diagram 7306 or 7307 with appropriate distance at the approaches to the junction, or other suitable signing, may each need to be investigated in consultation with the Highway Authority.

#### 2.3 COMMENT

Within the 'HD 19/03' listed categories of General, Local Alignment, Junctions, Non-Motorised User Provisions, Road Signs, Carriageway Markings and Lighting, no other road safety related items have been identified within the scope of this Preliminary Design Road Safety Audit.

#### 3. AUDIT TEAM LEADER'S STATEMENT

3.1 I certify that this audit has been carried out in accordance with HD 19/03.

#### **AUDIT TEAM LEADER**

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#### APPENDIX A

#### **DOCUMENTS EXAMINED**

Drawing No	Date	Scale	Description
CRL-001	08.12.09	1:500	Proposed Layout and Existing Contour Plans
Tabulation			'Approximate Vehicle Movements During Construction'
Tabulation			'BDF 28 Drilling Rig & Associated Machinery Mobilisation & Set Up: 2 – 4 days'
Photographs			Two photographs of 'Typical Exploration Site'

APPENDIX B

#### **KEY PLAN**

Reduction of Part of Drawing Numbered CRL-001

(Items 2.1 and 2.3 is not included on the Key Plan)

