Appendix 28.1

Traffic Statement

Traffic Statement

Dounreay Trì Floating Wind Demonstration Project

Dounreay Trì Limited

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1 Introduction

1.1 Hexicon AB is a Swedish design and engineering company that has developed a semi-submersible foundation for offshore wind power that hosts two Wind Turbine Generators (WTGs). Hexicon wishes to demonstrate this technology in Scottish waters.

1.2 In order to be eligible for 3.5 Renewable Obligation Certificates (ROCs) the Project must be commissioned and connected to the grid before the 1st of October 2018. Accordingly, Hexicon has created a Special Purpose Vehicle (SPV) called "Dounreay Trì Limited" for the sole purpose of developing, financing, constructing and demonstrating this technology within a site approximately 6km off Dounreay, Caithness ("the Site").

1.3 Dounreay Trì Limited ("the Applicant") is proposing to demonstrate a floating offshore wind farm called Dounreay Trì ("the Project") which shall consist of:

- A two turbine offshore wind farm with an installed capacity of between 8 to 12 megawatts (MW), subject to final approval of The Crown Estate, approximately 6 km off Dounreay, Caithness;
- A single export cable to bring the power to shore immediately to the west of the Dounreay Restoration Site fence line; and
- Subject to a Connection Offer from Scottish and Southern Energy Power Distribution (SSEPD), the associated onshore electrical infrastructure to connect the Project at, or near, the existing Dounreay 132/33/11kV substation.

1.4 This Traffic Statement considers the potential traffic and transport impact caused by the construction, operation and decommissioning of associated onshore electrical infrastructure to connect the Project at, or near, the existing Dounreay 132/33/11kV substation.

Legistation and guidance

1.5 The main guidance for this Traffic Statement is:

- The Institute of Environmental Assessment (IEA) publication Guidance Notes No. 1: Guidelines for the Environmental Assessment of Road Traffic 1993; and
- The Highland Council (2013) Roads and Transport Guidance for New Developments.

1.6 Additional information on traffic legislation and guidance is provided in Chapter 2, Legislatiove Context and Regulatory Requirements of the Envirormental Statement. This report

2 Onshore infrastructure, access and study area

Onshore Infrastructure

2.1 The onshore infrastructure shall comprise of:

- A cable landfall immediately to the west of the Dounreay Restoration Site fence line;
- A cable joint transition bay, where the offshore and onshore cables are spliced together;
- The onshore cable, buried to a depth of approximately 1m, subject to ground conditions; and
- A substation or switchgear to transfer power to the grid, to comply with requirements of the Grid operator, to contain equipment and provide control functions. A grid connection has been requested at, or near, the existing Dounreay 132/33/11KV Substation.

Access

2.2 Figure 2-1 outlines the onshore infrastructure which includes two cable land fall options to the west of Dounreay and Sandside Bay. The figure also depicts two potential substation locations which lie immediately south of Dounreay, adjacent to the existing 132/33/11kV Dounreay substation. The Project proposes to access the site via an existing access track which was installed during the upgrade of the Dounreay - Mybster line in 2015. This existing access track joins the A836. The Project would also utilise an existing area of hardstanding as a lay down area. This hardstanding was used during the construction of the 132/33/11kV Dounreay substation in 2013.

2.3 The Applicant shall liase with Dounreay Site Restoration Limited (DSRL) with regard to shift patterns and the associated buses to assist in the assessment of traffic peaks and potentially identify mitigation for traffic and transport impacts from the Project.

Study Area

2.4 It is presumed that the majority of the equipment and materials will come from the east of the development site. However there is a potential for personnel and materials, including concrete, and aggregate to come from the west of the site (Quarry at Melvich).

2.5 The study area focuses primarily on the A836 both east and west of the development from Thurso to Melvich and the A9.

2.6 Materials can either be sourced locally or brought to Caithness by sea, rail or road. Scrabster is the closest harbour to the onshore study area as such it has been assumed that materials brought by sea would be offloaded here and travel south on the A9 prior to joining the A836.

2.7 If rail were to be utilised to transport any components then it would be brought by train to Georgemas Junction where there is the facility to offload materials. It would then travel by road north on the A9 to join the A836 for the trip west to Thurso.

2.8 Materials coming by road from the south would travel up the A9.

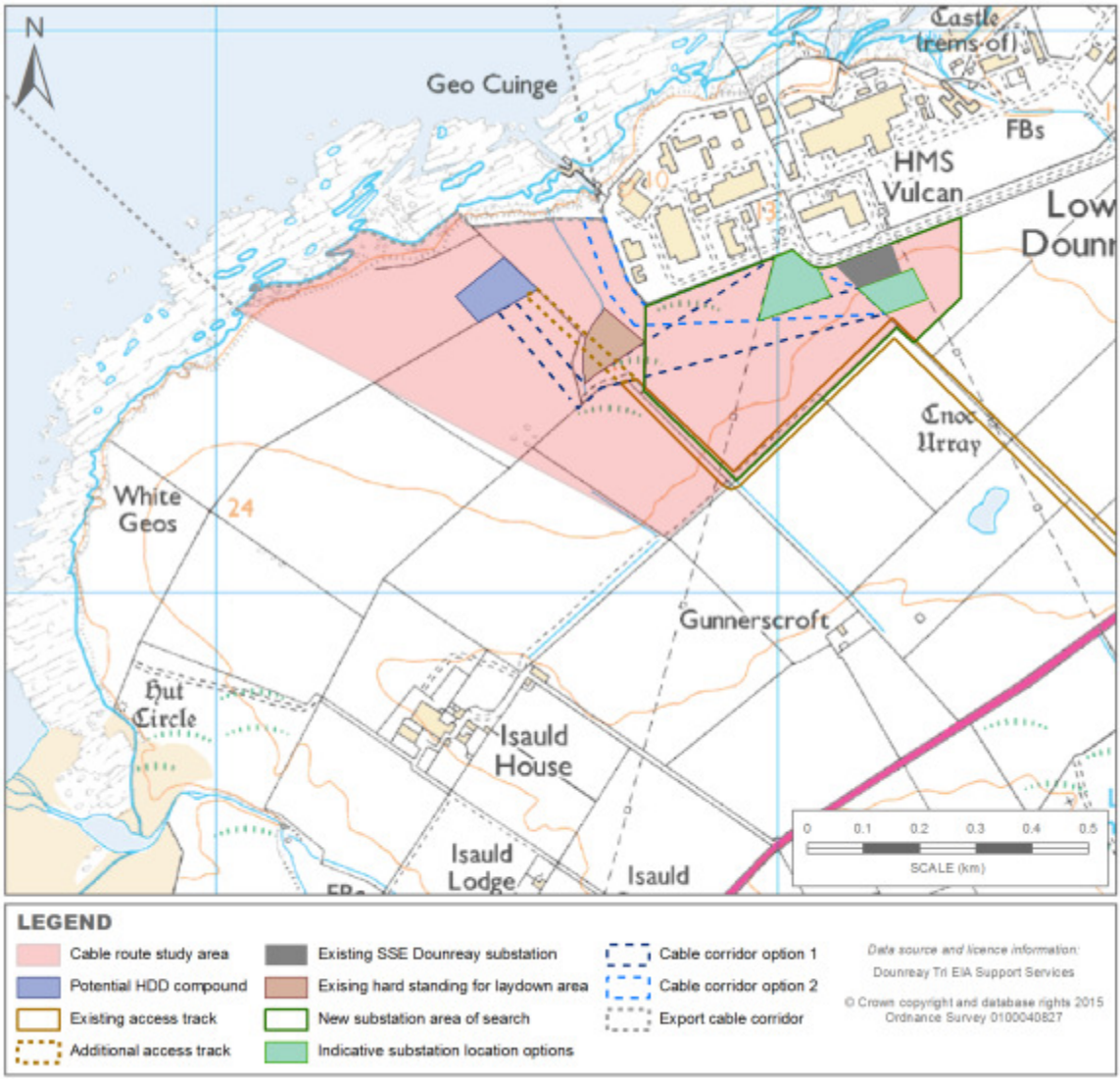

Figure 2-1 Indicative onshore infrastructure

3 Available Information

3.1 An existing access track from the A836 could be upgraded, if necessary, and temporarily extended by approximately 300m to serve the proposed HDD compound (Figure 2-1)

3.2 With regard to traffic and vehicle types required for the construction the full details are yet to be developed however some initial worst case assumptions can be made, these are provided in Table 3-1.

3.3 During operations there will be minimal traffic associated with maintenance activities. Decommissioning traffic levels are assumed to be no higher than those associated with construction.

3.4 The main source of traffic on the A836 is associated with people travelling to and from the Dounreay and Vulcan Nuclear sites for work. Hence the start and finish times for the shift patterns provide a good understanding of when peak traffic flows occur. Buses are timed to coincide with shifts.

3.5 The Department of Transport collate traffic movement data relevant information from which has been considered. In addition the www.CrashMaps.co.uk provides information on road traffic accidents, this has also been reviewed.

3.6 Following commissioning, it is assumed that the onshore substation will operate continuously (24 hours a day, 7 days a week) except during planned shutdowns for maintenance. The onshore substation will be designed to remain in situ during the life of the wind farm, which is envisaged to be up to 25 years.

3.7 There will be a limited amount of traffic to and from the substation for general operation and maintenance purposes. This is estimated to be around four vehicles per month carrying up to three persons per vehicle. Beside this, there will be no day to day personnel on site in normal operation. Unexpected faults may lead to increasing traffic volumes depending on the type of fault.

3.8 Routine activities on the underground cable system during the operational phase will be regular and ad-hoc visits to the manholes as required for inspection/maintenance purposes. Non-routine activities could include repair of damage to cable or replacement of a failed cable joint.

Table 3-1 Initial traffic and vehicle types required for the construction

Activity	Timescale	Workforce Numbers**	Vehicle Movement Needs	Assumptions	Source	Maximum Daily Movements			
						Car/LGV from west	HGV from west	Car/LGV from east/ south	HGV from east/south***
Cable landfall Installation	1 - 2 months	10-20	Staff commuting to work each day	Assume worse case 20 staff all drive to and from work in own vehicles.	The majority of the workforce will travel from the east (Thurso/Wick) a small number from the west.	8		32	
	5 days*		Delivery of duct and other materials.	Materials will be delivered in a short space of time and stored for use. Maximum of 5 vehicles per day	Material will be delivered by sea/rail or road from the south.				10
	4 days*		Delivery and Removal of heavy machinery/drilling rig.	Heavy equipment will be delivered at start of works on low loaders for example and remain on site until works are completed. Up to 4 deliveries and subsequent removals required (16 movements).	Heavy Equipment will be delivered by road from the south.				4
Underground Cable System	1 -2 months	8-10		Single excavation team. Assume worse case all staff drive to work in own vehicles.	The majority of the workforce will travel from the east (Thurso/Wick) a small number from the west.	4		16	
	15 days*		Delivery of the Cable, junction boxes and other	Smaller components may be delivered by LGV. Materials will be delivered as required.	Material will be delivered by sea/rail or road			2	4

Activity	Timescale	Workforce Numbers**	Vehicle Movement Needs	Assumptions	Source	Maximum Daily Movements			
						Car/LGV from west	HGV from west	Car/LGV from east/ south	HGV from east/south***
			materials.		from the south.				
	4 days*		Delivery and Removal of heavy machinery/drilling rig.	Heavy equipment will be delivered at start of works on low loaders for example and remain on site until works are completed. Up to 4 deliveries/removals required.	Heavy Equipment will be delivered by road from the east or south.				4
Onshore Substation	12 -18 months	20-50		Workforce numbers will vary through the construction works. Assume worse case 50 staff all drive to work in own vehicles.	The majority of the workforce will travel from the east (Thurso/Wick) a small number from the west.	10		90	
	4 days*		Delivery and Removal of heavy machinery/drilling rig.	Heavy equipment will be delivered at start of works on low loaders for example and remain on site until works are completed. Up to 4 deliveries/removals required.	Heavy Equipment will be delivered by road from east or the south.				4
	5 days*		Aggregate deliveries	Assumed deliveries are just in time, not stock piled, hence less likely to have lots of deliveries at one time.	Assumed from west, could be east, as that is the closest source.		40		
	5 days*		Cement deliveries	Assumes cement is brought in as ready mix. If batching onsite then delivery or dry products will require less	Assumed from west, could be east as that is the closest source.		60		

Activity	Timescale	Workforce Numbers**	Vehicle Movement Needs	Assumptions	Source	Maximum Daily Movements			
						Car/LGV from west	HGV from west	Car/LGV from east/ south	HGV from east/south***
				vehicles in total and fewer on any given day. Aggregate will have to be in place prior to cement being poured hence not possible to have them at the same time.					
	100 days*		Equipment deliveries.	Smaller components may be delivered by LGV. Equipment will be delivered as required.	Equipment may come by sea, rail or road. Road deliveries will primarily be from the east.	4		8	10
Maximum on any one day taking account of parallel working.						26	60	148	14

* Days may not be consecutive.

** Assumed 20% of workforce from west. 5% from Scrabster, 50% from Thurso and 20% from further east and 5% from further south.

*** Assumed that there are a maximum of 10 movements in any one day by road from south of the Train Station at Georgemas Junction.

4 Surveys and Studies Carried Out to Date

4.1 Average Daily Traffic Flows (ADTFs) for 2000 to 2014 is available from the Department for Transport (2015a) for various points on the A836 and the A9. This data provides a daily average flow of the number of vehicles passing a point in the road network each day, calculated in accordance with the Department of Transport Guidance (2015b).

4.2 The traffic count points (CP) providing relevant ADTF data is summarised in Table 4-1.

Table 4-1 ADTF traffic count points

Count Point Number	Location (OS Grid Reference)	Road	Section Covered	Relevant to
40935	NC8420 6510	A836	The Cross roads in Bettyhill to the junction with the A897.	Vehicles coming from Melvich and the west.
10934	ND0470 6897	A836	The junction with the A897 to the junction with the A9.	Vehicles coming from the east.
20801	ND1040 6920	A9	Scrabster Ferry terminal to the junction with the A836.	Deliveries coming by sea.
40800	ND110 6880	A9	Junction with the A836 to the B874 Princess Street	Deliveries coming by train, and vehicles from Thurso, the south or east.
40956	ND118 6815	A9	Junction with B874 Princess street to the junction with the A836	Deliveries coming by train, and vehicles from Thurso, the south or east.
10800	ND1465 6550	A9	Junction with the A836 to the junction with the A882.	Deliveries coming by train, and vehicles from the south or east (Wick)
10959	ND1796 4300	A9	Junction with the B870 to the junction with the A99	Deliveries coming from the south
50719	ND0660 1990	A9	Junction with the A99 to the junction with the A897	Deliveries coming from the south

4.3 The history of traffic incidents which occurred along the main routes to site was examined using the website CrashMaps.co.uk, between 2010 to present. This website provides details of the location, time and severity of traffic incidents occurring on UK roads, with severity divided into 3 categories of; slight, serious, and fatal.

4.4 When the A836 between Melvich in the west and the A836-A9 junction in Thurso to the east was analysed, 15 traffic incidents occurred over the 5 year period, 1 of which was fatal, 2 were serious and the remaining 12 slight. One incident hotspot was identified, with 4 slight incidents occurring at the junction between the A836 and Borrowston Mains, 3 out of 4 which incidents occurred during the commuting periods of 07:00 - 10:00, and 15:00 - 1800. Two other sections of the A836 where multiple incidents occurred at the same site were

identified; 2 incidents occurred at crossroads with a single track road west of Thurso (ND086 694), and 2 incidents including 1 fatality occurred at the bends west of Reay (NC934 643). Neither of the additional two multiple incident locations showed links to commuter traffic, or other common cause.

4.5 The A9 from Thurso to the Dornoch Bridge was also considered, to account for deliveries originating in the south. This stretch of road is single carriage way, and includes steep gradients, and numerous bends. As such there is a relatively high traffic incident rate, with over 100 incidents over the past 5 years.

Description of the Current Environment

4.6 The ADTF's for the relevant traffic count points are provided in Table 4-2, the average ADTF's for the last 5 years and the most recent year's data (2014) is provided.

4.7 The A836 and the A9 through Thurso is on the National Cycle Network. The route is popular in the summer months for those doing John O'Groats to Land's End, and year round by commuters to Dounreay. The commuters utilise the route in the mornings and evening to tie in with shift patterns whereas the leisure cyclists tend to pass Dounreay between mid-morning to early afternoon, having left John O'Groats 50 km away in the morning, or starting their last day of the trip in Tongue, Bettyhill or Melvich on their way north.

Table 4-2 ADTF Data for relevant traffic count points

Count Point Number	5 Year Average/ Year	Pedal Cycles	Motorcycles	Cars & Taxis	Buses & Coaches	Light Goods Vehicles	All HGVs	All Motor Vehicles
40935	2014	11	44	505	9	113	18	690
	2010/2014	5	30	470	17	107	23.2	648
10934	2014	6	41	1859	92	284	57	2333
	2010/2014	7	38	1854	83	256	53	2284
20801	2014	7	72	3012	30	596	177	3886
	2010/2014	9	67	3005	27	537	154	3789
40800	2014	8	6	2446	71	449	140	3111
	2010/2014	8	6	2468	71	453	141	3140
40956	2014	17	55	8548	126	1681	251	10661
	2010/2014	22	51	8615	121	1567	257	10611
10800	2014	0	13	2241	51	558	155	3019
	2010/2014	0	12	2236	46	503	147	2944
10959	2014	0	4	499	4	268	135	911
	2010/2014	0	4	498	3	242	124	872
50719	2014	4	18	1341	25	425	193	2002
	2010/2014	6	17	1338	23	383	180	1940

5 Identification of Potential Impacts

5.1 The Institute of Environmental and Assessment (IEA) publication Guidance Notes No. 1: Guidelines for the Environmental Assessment of Road Traffic 1993 sets out a methodology for assessing traffic and transport related environmental impacts. The IEA guidelines identify the following rules by which to undertake an assessment of potentially significant traffic and transport related environmental impacts:

- Rule 1: Include roads where traffic flows are predicted to increase by more than 30% (or where the number of HGVs are predicted to increase by more than 30%); and
- Rule 2: Include any specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

5.2 The following definition of a Specifically Sensitive Area has been applied: Medium to large rural settlements, containing some community and public services and facilities (particularly schools, churches, hospitals, areas of high pedestrian activity), areas with traffic control signals, waiting and loading restrictions, traffic calming measures and minor rural roads not constructed to accommodate frequent use by HGV.

5.3 Based on the traffic movements identified in Table 3- 3-1 and associate assumptions, the percent change to traffic flow for the various road sections has been calculated; the results of which are shown in Table 5-1.

5.4 During up to 10 days of the Project construction period, there is a potential for an increase of more than 30% of HGV movements to the west of the development site. Taking into account that this is a comparison of worst case daily movements with ADFT's, the short period involved and that the total number of movements is well below 30%, this is not deemed to have the potential to be a significant impact.

5.5 As shown in Table even with the pessimistic assumption that there will be no car sharing or use of public transport and assuming maximum levels; the increase traffic movements are below the 30% and 10% trigger level for all movements to the east and south of the site as such there is no potential for significant impact.

Table 5-1 Construction percentage change in traffic flow

Count Point Number	Specifically Sensitive Area	5 Year Average/ Year	Maximum No. of HGV's per Day	Maximum No. of Vehicles per Day	% Increase in HGV's per Day	% Increase in All Vehicles per Day
40935	No	2010/2014	60	86	260.9%	13.3%
10934 (West of Development)	No	2010/2014	60	86	113.2%	3.8%
10934 (East of Development)	No	2010/2014	14	162	26.4%	7.1%
20801	No	2010/2014	14	22	9.1%	0.6%
40800	Yes (Thurso)	2010/2014	14	144	9.9%	4.6%

Count Point Number	Specifically Sensitive Area	5 Year Average/ Year	Maximum No. of HGV's per Day	Maximum No. of Vehicles per Day	% Increase in HGV's per Day	% Increase in All Vehicles per Day
40956	Yes (Thurso)	2010/2014	14	64	5.4%	0.6%
10800	No	2010/2014	14	64	9.5%	2.2%
10959	No	2010/2014	10	18	8.1%	2.1%
50719	No	2010/2014	10	18	5.6%	0.9%

Cumulative Impact

5.6 There are no known proposals in the area which will have traffic impacts, during the Project's onshore construction period.

5.7 **Error! Reference source not found.** 5-2 summarises the potential impacts.

Table 5-2 Potential impacts on traffic and transport during construction, operations and maintenance, and decommissioning of the Project

Potential impacts during construction	
Impact	**High level impact summary and justification**
HGV Movements (west)	Movements as described in Table 3-. Large movement number on up to 10 days, are not enough to increase the annual daily average levels, hence no potential to be significant.
All Vehicle Movements (west)	Movements as described in Table 3-. Maximum number of daily movements is well below the 30% increase in average daily movement levels hence no potential to have a significant impact.
HGV Movements (east and south)	Movements as described in Table 3-. Maximum number of daily movements is well below the 30% increase in average daily movement levels and below 10% in specifically sensitive areas, hence no potential to have a significant impact.
All Vehicle Movements (east)	Movements as described in Table 3-. The maximum number of daily movements is well below a 10% increase in average daily movements hence no potential to have a significant impact.
Potential impacts during operations and maintenance	
Impact	**High level impact summary and justification**
HGV Movements	HGV movements will only be required in event of equipment failure where a large component needs replaced. As such there is no potential of a significant impact to occur.
All Vehicle	Vehicle movements associated with operations will mainly be associated

Movements	with personnel carrying out maintenance activities. Number of people involved will be limited and as such will not give rise to significant vehicle movements, no potential significant impacts area predicted.
Potential impacts during decommissioning	
Potential impacts arising during the decommissioning phase are expected to be similar to, but not exceeding, those arising during the construction phase. As such no significant impacts are predicted.	
Potential cumulative impacts	
No known cumulative impacts.	

Data Gaps

5.8 The traffic movements associated with the development are not as yet fully understood in terms of routes and numbers. This will be better understood as the project progresses into the detailed design and procurement phases. Enough information with regard to the scale of movements is however available to draft a Traffic Statement.

Mitigation

5.9 The Applicant recognises that the development control process continues through the lifecycle of the Project. Consequently, the mitigation measures have been incorporated into the Project Design to best manage (prevent, reduce or offset) environmental impacts as the project progresses through fabrication, installation, operation and finally to decommissioning.

5.10 Table 5-3 sets out the mitigation measures which are relevant to traffic.

Table 5-3 Mitigation measures relevant to traffic

Traffic Mitigation Measures		
Ref	**Title**	**Description**
GM15	Transport Statement	Prepared in accordance with the current Transport Scotland document, Highland Council Transport Assessment Guidance, relevant Transport Scotland guidance and other guidance as necessary.
GM16	Construction Traffic Management Plan	Part of the Onshore construction method statement

6 Conclusions and Next Steps

6.1 It has been concluded that there is not the potential for a significant environmental impact associated with traffic and transport in EIA terms. This does not however mean that steps will not be implemented to minimise impacts. There is scope for car sharing and public transport use to reduce the vehicle movements associated with the Project and this should be encouraged. The accident blackspot on the A836 can be highlighted to all drivers along with precautions to be taken when driving the A9 especially in adverse weather conditions.