

*Trump International Golf Links*  
SCOTLAND

# Golf & Leisure Resort

Menie Estate, Balmedie, Aberdeenshire



Revised Course Layout - February 2008  
Hole-by-hole Analysis

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May 2008

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## **1.0 INTRODUCTION**

### **1.1 Context**

The outline planning application for the TIGLS golf and leisure resort development was submitted to Aberdeenshire Council on 27 November 2006. In April 2007 a detailed planning application was submitted for the championship golf course, and it was this routing plan which was used as the basis for the environmental statement that was submitted to Aberdeenshire Council on 30 March 2007. The Environmental Statement included a hole-by-hole analysis in terms of geomorphology.

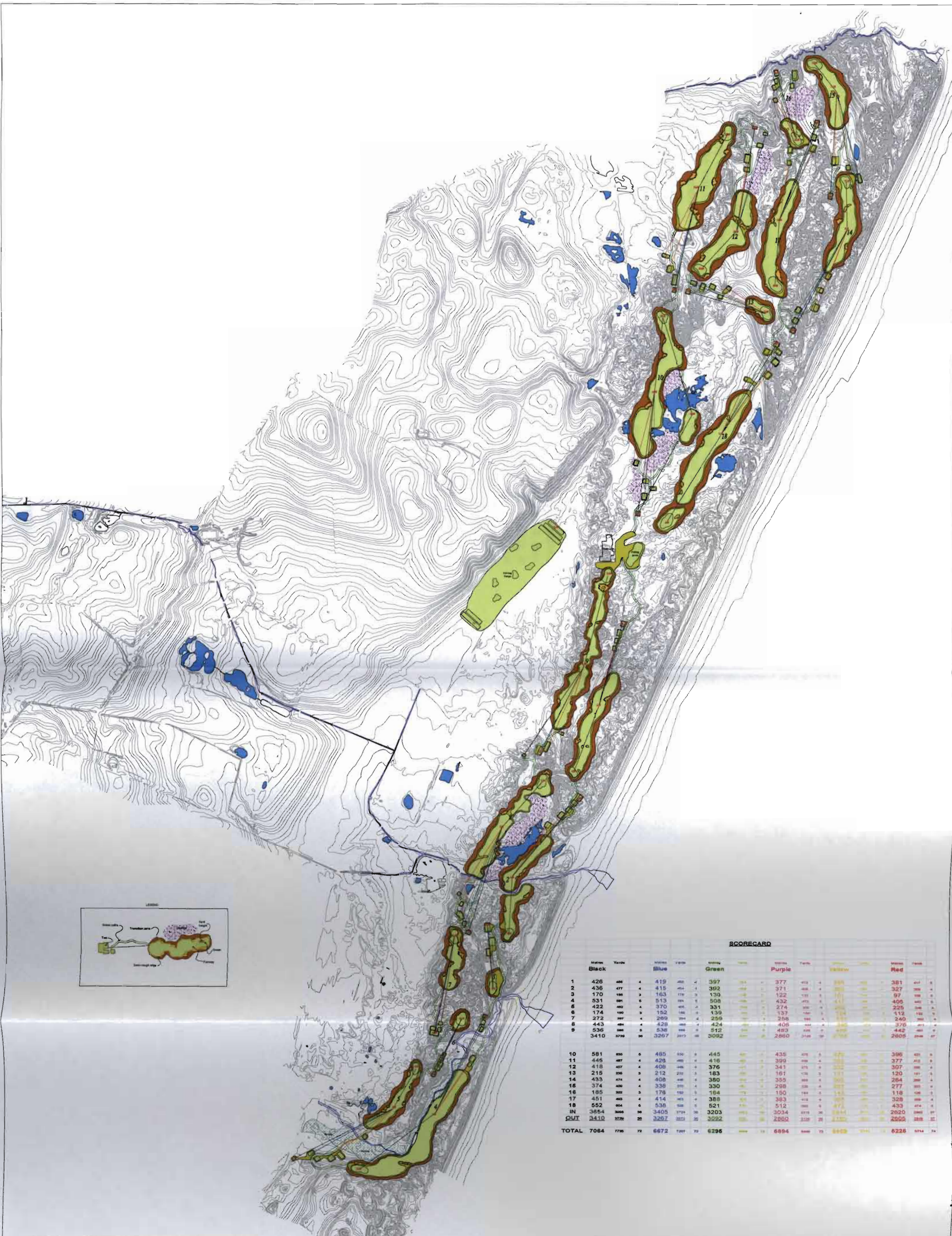
At the request of Aberdeenshire Council and in response to a consultation response from Scottish Natural Heritage, a hole-by-hole analysis of the golf course was prepared which addressed the ecological impact of individual holes. The document containing this analysis was submitted to the Council in July 2007.

Following the 'call in' of the outline planning application by the Scottish Ministers and their decision to hold an inquiry, the applicants withdrew the detailed application for the golf course, and submitted a revised course layout which illustrates the iterative design process which has progressed since the lodging of the outline application, the detailed application and the accompanying Environmental Statement. The revised layout is the current indicative layout of the proposed golf course, and represents the applicants' preferred method of mitigation.

In response to the submission of the revised layout, the inquiry reporters noted that the revised layout differed materially from the original layout, and that this may have implication for the environmental effects assessed in the Environmental Statement and supporting documents. As a result, the reporters advised that all parties would be assisted by a hole-by-hole analysis showing how the effects differ from those assessed in the ES. The reporters further suggested that discussions take place with SNH to seek agreement on the revised assessment of the likely environmental effects.

The following hole-by-hole assessment comprises three sections:

- A description of the golf holes
- A review of the geomorphological effects
- A review of the habitat effects



**SCORECARD**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	IN	OUT	TOTAL
Yards	426	170	531	422	174	272	443	536	3410	581	445	418	215	433	374	185	451	552	3854	3410	7064
Black	496	188	591	482	180	287	488	588	3728	600	487	457	256	474	408	403	443	604	3666	3410	7076
Blue	419	163	513	370	152	269	423	538	3267	485	425	408	212	408	335	178	414	536	3405	3297	6702
Green	397	133	508	331	139	259	424	512	3092	445	416	376	183	380	330	164	388	521	3203	3092	6295
Purple	377	122	432	274	137	258	405	483	2880	435	399	341	161	355	288	150	383	512	3034	2880	5914
Yellow	355	111	411	255	134	258	405	483	2880	417	377	322	151	355	288	147	383	471	2971	2880	5851
Red	381	97	405	225	112	240	375	442	2805	395	377	307	120	264	277	118	328	433	2820	2805	5625

DRAWING REVISIONS BRIEF DESCRIPTION OF REVISIONS	DISTRIBUTION LIST		DRAWING TITLE	PROJECT	CLIENT	DATE	SCALE	DRAWING No	REVISION
	NAME	DATE							
			GOLF MASTERPLAN	TRUMP INTERNATIONAL GOLF LINKS	TRUMP	FEBRUARY 2008	1:3000	A38/H/100	
								DRAWN	CHECKED
								MNW	MGH

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## 2.0 DESCRIPTION OF GOLF HOLES

The following is a hole-by-hole discription of the revised golf course layout.

### 2.1 Hole 1

From a raised teeing position on a medium dune, the south playing par-4 465 yard 1<sup>st</sup> hole wonderfully confines itself in a natural dune valley, generous and wide in places, that sets the tone for the course to come. There is a sense of near isolation as it is well away from the clubhouse, with only part of the adjacent 9<sup>th</sup> hole visible from the tees. The natural formation of the land suggests a dog-leg right to left, with a massive formation coming left of the fairway in the landing area that pushes the hole to the right before opening back up left, spacious with a formation to the right and front of the green now coming into the fairway. The raised green sits on a natural plateau, with a huge dune behind it, is eminent and proud, with a deep drop behind the green. The sea will not be visible, but the surrounding, massive dune system will be resplendent to view from the tee.

### 2.2 Hole 2

Walking from the 1<sup>st</sup> green to the 2<sup>nd</sup> tees the North Sea appears as the player moves to a higher tee position than the 1<sup>st</sup> hole. From the tee position on the 479 yard, par-4, a grandeur panoramic view over the golf course and the wider countryside is different than the first hole's lower position. The tees are set among dunes and look down to the fairway, flanked left by low-lying dunes that converge into it as the hole gets longer from the tee, and to the right by low-lying heather that is a definite threat. A meandering burn is a major part of the strategy of the hole that bisects the fairway at mid-point. Challenging it and carrying it left brings a shorter shot and better angle into the uphill green that is slanted left to right and naturally set in a series of low rising mounds, with the entire coastal primary dune system to the left of the hole after the burn crossing. With quartering winds into the player's direction of play, the danger right in the low-lying heather, with an uphill second shot into the green, this hole will be very difficult.

### 2.3 Hole 3

The first hole to be orientated towards the sea, this par-3 of nearly 200 yards is a fine short hole that plays through a dune valley. From the elevated tee that tumbles down to a dune slack, the slightly elevated green sets hard to a dune system right, and a burn behind it. A lovely viewing window is formed behind the green to the sea by two dunes either side of it, quite a different viewpoint than the previous two holes finding themselves surrounded by dunes.

### 2.4 Hole 4

A formidable par-5 of nearly 600 yards, this full-blooded hole demands nerves and skill to negotiate it. From slightly raised tee with the sea in view to the left the fairway has a major coastal dune system on its left, with sloping ground to the right that is bordered nearly the full length of the hole by another meandering burn. It's a feature that has be negotiated on both the drive and second shot by many players. The green and its approach is located on a wonderful dune formation, elevated from the

fairway, that has a bold panoramic view of a majority of the golf course to the north, including some holes on the dome. It is the last hole playing to the south on the front nine before turning back to the north towards the clubhouse.

## 2.5 Hole 5

A fine mid-long par-4 that plays with the prevailing wind, this dog-leg left gives the player the option to carry as much fairway left that is angled to the line of play, as possible to have a shorter second shot to the nicely nestled green on a sloping hillside. The initial drive carry, from elevated tees, is across a wetland. To the left of the hole is a vast area of heathland, as well as a swath of well-developed heather to the right of the hole, with marram interspersed, perhaps the most prolific example heather of all the holes on the course. The canting right to left terrain acts as part of the strategy of the ground game, and there is a nice contrast between the dune like landscape of the hole in contrast to the wide open land to the right, flattish, with the heather being widespread across it.

## 2.6 Hole 6

As dramatic a par-3 hole to be found anywhere in the world, this short hole is certain to garner attention from its sheer beauty and difficulty. At 190 yards, with a helping wind, the elevated tees are located on a dune that reduces in size as it moves to the left, and then massively reforms back to the right to an expansive dune crest that partially hides a generous greensite found well above the burn on the 4<sup>th</sup> hole. The hole after the tees reduces in height to a dune slack from which it erupts with the most wonderful dune that extends a full 12.5 metres. The vista from the tee is unmatched to the greensite that will be one of the most interesting and daunting, set in a fine series of dunes that will surround nearly three-fourths of the green, with the other fourth being exposed to the burn below.

## 2.7 Hole 7

The first short par-4 on the course, the elevated series of tees encounter an undulating and much narrower dune landscape to play through than on the previous holes. While short for a par-4 the hole nonetheless presents as an option to drive the green from the tee, but with attendant trouble for any mis-hit shots that do not arrive to the green. The valley floor of the fairway shifts abruptly left and right between dune structures that are much more part of the playing axis as would be on such a technical short par-4 hole. They add interest and contrast to the previous holes that were either elevated or open, the player walking through smaller and more uneven areas, isolated, compressed. The marram grass will be more omnipresent as a playing hazard in this section of dune system. A natural greensite provides a home for the final target that falls off on most sides except the back where it is abutted by a dune.

## 2.8 Hole 8

From an isolated feeling hole the 8<sup>th</sup> opens up again to fine vistas across the course and countryside. Elevated tees provide another unencumbered view across a hole whose essence and feel is decidedly individual to the others on the course. A medium dune system found nearly the entire left of the fairway helps turn the very long par-4 hole to the right, with various oddities along the way to the green, including

isolated dune structures, an extensive low-lying heather to the right of the fairway, a massive dune structure behind the green in which it sits within a fantastic split in the dunes, creating a wonderful cavity to the rear of the green. The elements – dunes, low lying and medium lying heather, openness, compelling topography, extreme length of hole, bold dunes as a greens backdrop, all add up to make this a remarkable hole.

## 2.9 Hole 9

An inspiring finishing hole for the front nine, the 9<sup>th</sup> is the second long hole as it reaches nearly 590 yards in length. The hole winds its way through dunes, widening and narrowing as it proceeds to the greensite after a generous landing area that narrows considerably and continues its way through columns of dune structures. Much like the 7<sup>th</sup>, the marram-grass covered dunes, with a sense of isolation, will be part of the hole essence. The greensite and its approach will also continue the closed dunes effect by the careful recreation of them to the right of the green.

## 2.10 Hole 10

The start of the back nine sets the tone for a decidedly different feeling course than the first nine. From a set of tees that are found among swaths of heather, the course's general elevation starts to rise from this point to create more views across to the sea. The fairway is split in two options on this par-5 hole, a large natural wetland creating the division and option choice to attack this most rare looking links hole. Heather abounds either side of the fairways until the landing area where the dune formation to the right of the green provides one of the most memorable sites on the course, rising to a height of 33.5 metres above sea level. The conical peaks spark interest, and the fairway moves up a natural valley to the left of this into a large opening between dunes to a nearly enclosed greensite. The magnitude and shape of the dune to the right of the green is so impressionable, it forms an iconic oddity to an otherwise more flat surrounding area.

## 2.11 Hole 11

A lengthy par-4 of nearly 490 yards, the dog-leg right 11<sup>th</sup> finds itself on the edge of the dome system and the open pastureland to the left. A superb dune system to the right of the hole has been preserved, as well as locating a natural greensite, which made some of the hole need to be situated somewhat to the left in the open, flatter, pastureland. An authentic recreation of a large dunes structure to the left of the fairway helps ensure a continuity of the links course feeling. This hole is the last hole on the course that touches the outside boundary to the west – from here on in the course remains firmly in the context of the links system.

## 2.12 Hole 12

A hole that reverses direction to the south from the previous seven holes that ran to the north, the drive from the tees is to the highest fairway on the course. The fairway rises upwards to a crest on the horizon that has the most unequalled view across the entire golf course and site. A large created dune in the left rough helps turn the hole to the right and the fairway follows the slope of the terrain back to the left to a greensite that is also the highest on the course, and is located against a small

interesting dune, with additional dune moundworks to be on the the right hand side to reinforce and balance the area. Again some superior views across the back nine golf course are from this point of the course.

### **2.13 Hole 13**

A fine short hole that plays due east, the 235 yard par-3 13<sup>th</sup> is another memorable hole. From a series of tees that are just behind the 12<sup>th</sup> green, the drive is across a wide and smooth low that rises up the green site. Behind the greensite is a curious array of small sand mushrooms that are away from the green and set within the dunes that abut the North Sea just behind them. The green is set from left to right and will make the player have to shape a shot, particularly if the pin is back right on the green. Three menacing bunkers guard the entire right and foreground of the green. The horizon line towards the sea, along with the dunes after the green is a fine setting for yet another stunning short hole.

### **2.14 Hole 14**

Perhaps the most undulating hole on the course and the one found nearest the North Sea, the 14<sup>th</sup> provides drama and beauty. From elevated tees the hole plunges downward into a natural dune valley. The views from the tee are unparalleled in golf. The flat expansive sea to the right with the heaving, tumbling action of the fairway all the way to the greensite that is located above the landing area. Marramgrass abounds on this hole as the major obstacle to avoid in front or either side of the fairway, whilst the fairway is the most undulating of all on the course. At 475 yards the hole is formidable in length, and possessing the wonderful topography and being near the sea is certainly one that is etched in one's mind.

### **2.15 Hole 15**

A superb par-4 of around 410 yards, this hole naturally dog-legs left through a fine valley that is wide and interesting on either side. It is bordered to the right by a large and fluid dune system that is rather smooth and sweeping on the side, and massively tall dune peaks of irregular character. The left side of the hole is gentler and is higher than the fairway also, giving a sure indication of the fairway. The hole gradually arcs to the green from right to left. Players will need to decide how much fairway they would like to challenge to cut across, and be woeful of a central fairway bunker that promises to entrap the player seeking the safe route to a long carry. The fairway, in contrast to the 14<sup>th</sup>, will be simple, rather flat, while the green is in front of a dune system. In some ways the hole has a very unique aesthetic all to its own, recalling some high alpine settings with their unique formations and landforms.

### **2.16 Hole 16**

The last of the short holes, the turn is made back in the direction of the clubhouse for the last three holes. Set in a large dune the six different tee positions offer varying angles of play into the green. It is set against the hillside right, with a series of echeloned cross bunkers moving from right to left in a series. The long, narrow green will require careful judgement to arrive to the best point where the pin will be located for the day. At 203 yards with a wind generally in the face of the players, the hole will play longer than the indicated distance.

**2.17 Hole 17**

A long and very demanding par-4, the tee shot is influenced by a rather large dune mound in the landing area right with several bunkers in the face of it. The tee shot is over very broken ground with the mound system in the landing area very visible. A large low runs to the left of the fairway almost the complete length with a wonderful dune system to its left. After the landing area the ground slightly drops and then rises again to a green that is set against the same dune system to the left of the low. The approach is in a valley system and the wind will be in the player's face the entire length of the hole to add even more effective distance than the distance indicates.

**2.18 Hole 18**

The penultimate hole is the last of the par-5's, and at 606 yards, with wind against the golfer, it should provide a memorable finish to the round. The tees are some 13 yards above the landing area, and the entire hole lays itself out from their position. A natural wetland pond is to the left of the hole, between the first and second landing areas. The moderately undulating fairway is bisected by a small burn to be formed some 40 yards in front of the green and angles left to right that will add interest to those laying up their drives to a safer position on the fairway. The hole is bordered to the left by the coastal dune and to the right by the heather clad area of the 10<sup>th</sup> hole. At the end of the day the sun will strike this hole to create a wonderful pattern of shadows across an array of various textured elements that will be extremely beautiful and interesting to hold as one completes their round of golf.

### **3.0 HOLE-BY-HOLE GEOMORPHOLOGICAL ASSESSMENT**

#### **3.1 Introduction to the 'Front Nine Holes'**

Before analysing Holes 1-9 south of the SSSI boundary, it is useful to describe the general geomorphological structure, which differs considerably from the dune complexes within the SSSI to the north. As described in the Environmental Assessment, the main line of stable, mature dunes, hills, ridges and intervening hollows runs parallel to, and close to the coastline. This alignment is southwest to northeast. Near the Menie Burn, the second system of equally complex old dunes and hollows diverges increasingly inland, i.e. with a south to north orientation, finally meeting the old post-glacial escarpment close to the main road access at Leyton Cottages. To the west of the dunes area are undulating links. Between these two main axes, the topography consists of old ridges, dunes, conical hills - all stable, all mature - often with deep hollows, 'valleys', deflation plains with heath vegetation, flooded and shallow water bodies.

South and east of the Blairton Burn (an area used by Holes 4 and 5), the ground is the north edge of the Balmedie dune and links area, where there is also a north encroaching sand arc or dome of bare sand.

Except at Balmedie, no area south of the SSSI boundary contains more than small areas of bare, mobile sand. The coastline is also accreting with new embryonic, small backshore dunes and extensive small-scale, upper beach sand accumulations.

The positioning, numbering, length and precise orientation and location of tees, greens and fairways in the 'Front Nine' holes are all different, to varying degrees, from the previous route plan. Nevertheless, the impact on geomorphology is essentially the same. Without exception, all holes are located on stable, mature dunes, sand hills and various types of deflation plains and 'valleys'. There are also marsh, heath and links areas. Two streams, the Menie Burn and the Blairton Burn must also to be crossed. To a greater extent than North Menie, there are several well-defined paths and tracks in most of this area. A brief description of each hole is appended below:

#### **3.2 Hole 1**

The orientation of the fairway is parallel to the coastline and well inland from the coastal dune. The topography is mature, highly dissected, stable and irregular. The fairway, which lies more than 100m south of the tees, tends to follow lower ground but considerable 'smoothing' by 'cut and fill' will be required. The green, which is at an altitude of 7m O.D., takes partial advantage of a pre-existing low area, surrounded by higher dune ridges. The tees are elevated on higher group of old sand hills. There are no bare sand areas, only structural reshaping of the pre-existing topography will be needed.

#### **3.3 Hole 2**

This has a complex design which exploits natural features in the topography and drainage features, including a meander bend where it crosses the Menie Burn. To the west of the main fairway, the lower part of a seasonally wet deflation surface will be used to create an expanded lake. Part of the fairway runs close to the north bank of the Menie Burn as it approaches the beach zone. Care will be needed to avoid

any future possibility of stream erosion should the Burn be allowed to migrate northwards from its present alignment. Nevertheless, this is unlikely, as it will be easily maintained by minor works further upstream at the meander bend. This will have no effect on the beach or sedimentation processes. North of the stream all surfaces are mature, stable and geomorphologically inactive. South of the stream, the fairway and green, at an altitude of 6.5m O.D., occupy lower, stable old dune and erosional topography and, on the whole, use the pre-existing lower ground landforms between higher dunes and ridges on both sides. There are no bare sand or mobile surfaces. Most topographic smoothing will be needed south of the Menie Burn, which will be bridged.

#### 3.4 Hole 3

This is a short hole with an extended apron approach to the green. The tees are on high, mature topography west of the Hole 2 green. The green and approach are sited on an old, level, low altitude deflation plain with steep mature dune slopes on either side. The main concern relates to the rear limit of the green which is defined by a well-established track but is also relatively close to the steep bank where the Blairton Burn turns sharply eastwards to approach the beach zone. This bank is stable but will need monitoring should the channel seek to develop in a more westerly direction. This is unlikely as the channel is arguably over extended northwards, and, naturally would probably seek a more direct outlet further south in an area which will not be used by the new golf course. The green is at an altitude of 5.5m O.D. Relatively little topographic smoothing will be needed for this hole.

#### 3.5 Hole 4

This is an exceptionally long hole and lies east of the south to north alignment of the Blairton Burn. As such it lies outside the Menie Estate. The fairway uses a combination of stream terrace, some of which is marshy, and lower dune 'backslopes' from the main coastal dune ridge. This has no effect on the undertaking to avoid this coastline feature, which is locally wide, mature and stable. Two tees are on similar terrain south of the stream but three 'long' tees lie north of the stream on a high old 'bluff' and mature irregular dunes. These will not be affected by the position of the stream unless there is significant migration of the present channel. The fairway doglegs to the west for the approach to the green - again parallel to the stream. Part of this section uses stable slopes but near and at the green at an altitude of 12m O.D., it comes close to the north mobile edge of the Balmedie sand sheet. There is a marshy terrace on the north side. This mobile sand will need to be controlled and some ground stabilisation will also be needed, but the most mobile part of this sand sheet is further west (see Hole 5).

#### 3.6 Hole 5

The tees for this hole lie south of the Blairton Burn on the mobile encroaching slope of the Balmedie sand sheet. Two higher tees lie to the west on more stable, older dune remnants. Between the tees and the fairway, the terrace of the stream is very marshy and will need to be raised to avoid winter flooding. The fairway lies on the west margin of the west line of mature dunes and sandhills (see Introduction). It is mainly on undulating links with heath and short dune grasses. The green, at an altitude of 8m O.D., is sited in similar topography but rests against a slightly higher

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old dune ridge on its north and east sides. The entire area is mature and stable, and will require normal amounts of topographical smoothing.

### **3.7 Hole 6**

This short hole has its tees 50 to 60 m east of the green of Hole 5 in high, broken old inland dunes and sandhills. The opening drive clears a low level plain, which is based on an old meander bend of the Blairton Burn. The green, at an altitude of 12.5m O.D. and short fairway approach occupies a higher area of complex old dunes, ridges and broken topography. The entire area is mature and stable, but the southeast corner of the transition zone, which runs close to the steep bluff created by the Blairton Burn, which is presently in a stable channel. Ground reshaping will be localized but important for this Hole surrounding the green and apron. Selective topographic smoothing and reshaping will be needed.

### **3.8 Hole 7**

The tees for this hole lie west of the green of Hole 6 on similar topography. A relatively long opening drive crosses similar terrain of mature, irregular sand hills, ridges and hollows. The fairway is short, c.100m and is superimposed on a broken area of old dunes and sandhills on the landward flank of the dune system (see Introduction), which rises above the level, low-lying links surface to the west. Like Hole 6, this dissected terrain will need smoothing by local cut and fill operations, but there are no bare sand areas other than beside well-used tracks which meander through this part of the south dune area. The green is at an altitude of 12.5m O.D. and is sited in a pre-existing slight topographic depression.

### **3.9 Hole 8**

The tees for this hole lie some distance south of the Menie Burn on a series of higher dunes and ridges. The fairway begins on the north bank of the stream and stretches for more than 300 m northeast and crosses variable types of landforms - undulating links on the south and east, moderate to high flanking dunes in the north and east, whereas the east side runs over and beside a heath-covered mature deflation plain with a shallow lake further eastwards (contiguous with Hole 2). A few higher, old dune ridges mark the approach to the green on the east side. The green, at an altitude of 7.5m O.D. occupies the more northerly extension of this large, old deflation plain with high steep-sided dunes to the north and east. The entire area is an old, mature surface with little or no bare sand other than near old tracks. The amount of reshaping and smoothing is variable, but some parts of the fairway are on relatively even terrain.

### **3.10 Hole 9**

This is the second largest hole in the course at 536m. and ends just south of the Clubhouse. The tees are sited on moderately high old dune ridges, which are part of the diverging second dune ridge formation which terminates against the old post-glacial cliffline and is described in the general introduction. The fairway, which is less than 100m from the tees, follows the general crest orientation of this landward line of dunes. The ground is very uneven and will require considerable cut and fill to create a smooth level or gently undulating surface. The green, at an altitude of 12m O.D.,

will be constructed on similar uneven terrain with higher old dunes and sand hills to east and west. There are no bare sand or mobile areas anywhere in the area to be used for this hole.

### **3.11 Introduction to the 'Back Nine Holes' (within the SSSI)**

All these Holes lie within the SSSI and impact on its geomorphological interest. Holes 10, 11, 14, 15 and 16, and parts of other holes, are located in stable, mature dune topography, which is similar to the south area. In places, some old deflation surfaces are used, and these normally lie close to the winter water table. Five fairways - 10, 15, 16, 17 and 18 - contain small areas of ground that is composed of glacial deposits with a veneer of blown sand. These areas also have wet features in winter. The holes at the north end, i.e. 14, 15 and 16, have new locations compared with the earlier route and therefore now avoid the second area (the first being the 'dome') of active wind erosion and redepositional sand movements. As with the 'First Nine' holes, all tees, fairways, and greens require construction, stabilisation and cut and fill construction techniques. These cut and fill operations have not been described in detail, but are referred to as topographic smoothing where any uneven topography, deeper 'hollows and depressions' and obstructive ridges and sand hills are modified or partly removed to achieve to necessary shape of the fairway.

### **3.12 Hole 10**

The alignment of this hole has altered to eliminate the dog-leg feature of previous versions. Except for the green, this long hole crosses stable deflation and 'heath' type surfaces with limited sand cover: glacial deposits are close to the surface which is often wet in winter. A large, very irregular shallow lake is located to the east of the fairway and has a supplementary or optional small fairway area to the east of this lake. The approach to the green also uses a natural deflation surface with higher enclosing dune ridges forming a U-shaped natural setting for the small green. Nevertheless, the surrounding dunes are high and recently active. Some steeper bare sand slopes might need local stabilisation to prevent slumping. The altitude of the green is 23.5 m O.D. as it is part of the higher western area of the dune systems.

### **2.13 Hole 11**

The main features show little change but tees are in improved position, slightly further north on the north side of complex residual dunes. The fairway and green (which is at an altitude of 25 m O.D.) are located on the high level links surface with stable dune slopes to east side. The area between tees and fairways consists of relatively recent young redepositional dunes. The highest tee is close to the tees of Hole 13. Although not shown on the layout map, there is a plan to construct artificial dunes and ridges on the flat ground west of the fairway, which is presently used for grazing.

### **3.14 Hole 12**

There has been some repositioning of features but the Hole continues to necessitate marginal use of the north extension of encroaching young dunes, which are part of the dome complex. The tees lie on stable, mainly deflated surface areas. A short first drive will be needed over a small area of hummocky dunes. The green is close to, and just north of the tees for Hole 13 and occupies ground at 24.5m O.D. and will

be part of the stabilisation requirements of the 'dome' bare sand area. About 50% of the Hole is on some type of stabilisation area.

### **3.15 Hole 13**

This short hole with its six tees is located west to east across the central/south part of the rising west side of the bare sand dome and its construction is totally dependent on progressive stabilisation of this surface. This stabilisation will have to cover a much greater area than the fairway, green and tees. It will require almost complete cover, in order to avoid sand drifting to or from the areas to be used for the requirements of the golf course design. The tees will partly use several 'mushroom-shaped' small remnant dune features (butte dunes), which under natural conditions would probably erode away, in time. There is almost no fairway: the green has an extended open approach. The green is located partly on the relatively steep east slope of the 'dome'. This area is subject to sand movement under existing natural conditions and will need to be controlled. The green is at an altitude of 19m O.D.

### **3.16 Hole 14**

This is a greatly improved positioning, especially in the location of tees which have shifted northwards to more stable ground on top and on the lower eastern side of the high dune ridge complex. The fairway and green are in similar positions and use the low, mature, well vegetated 'valley' between the coastal dune and the interior high dune ridge. The green uses a low altitude natural hollow at an elevation of 11.5m O.D. The highest tees occupy the crest of an actively mobile part of the dune ridge and will require local stabilisation.

### **3.17 Hole 15**

This is essentially a new location which lies further west and occupies a natural 'hollow' west of the steep eroding dune escarpment with extensive active bare sand slopes. The fairway is located mainly on low wet sand surface, with underlying glacial deposits on the west side. The green uses a natural deflation hollow at the base of the eroding escarpment of the northern group of high dunes. The tees are located on stable mature ground, where it rises to the higher flank of the main dune ridge complex to the east. The altitude of the green is at 12m O.D. Unlike the previous course layout, this hole now avoids the other main area of active mobile sand at the north end of the SSSI. It is also located so that any sand drifting will be eastwards away from the hole.

### **3.18 Hole 16**

This is an improved location for a 'short', north to south hole. The green and apron are on stable ground to the east of a mature high dune side slope. The altitude of the green is at 18.5m O.D. The tees occupy fully vegetated ground on the south side of the escarpment face of the northern group of high dunes. No special stabilisation measures are required for this hole, and topographical re-shaping is relatively minor.

### 3.18 Hole 17

Minor changes have been made to tees and the fairway which is slightly wider and, as before, occupy a stable deflation surface which is close to an underlying ridge of glacial material. The tees occupy the lower slopes of stable south-facing slopes of older high dunes. The green, which is at an altitude of 19.5m O.D., is situated on the active north/northeast encroaching flank of the 'dome' and contiguous areas. The green is therefore relatively close to and similar to the green of Hole 13. The approach to this green is in an active mobile environment for sand movements with extensive examples of young forming dunes. It is also closer to the steep west-facing slope of the very high dune ridge to the east, which is subject to wind erosion and local slumping downslope. About 60% of this hole will require some degree of stabilisation and other forms of protection.

### 3.20 Hole 18

This hole is shorter than previous versions but uses a straighter alignment. The main change is in the exact position of the five upper tees which lie on the crest and upper slope of a high, prominent dune with panoramic views over the entire coastal area to the south. This area consists of small, actively mobile bare sand surfaces between small patches of remnant and re-invigorated Marram-clad dune and butte features. This position and exposure will need well positioned, protective stabilisation measures. The initial drive is across a deep erosional gully, which was formerly connected to a wide gap in the coastal dune ridge. Erroneously referred to as a blowout, this gap fed sand to the southeast corner of the dome complex and may have had some effect in its general mobility. The gap is now closed and revegetated but the bare sand hollow remains. Since it is to be driven over it may be left in its natural condition which includes winter flooding. Thereafter the long fairway and green runs to the west of a permanent dune lake and parallels the line of the coast. It consists of broken, mature undulating dune topography with some moderately high ridges. This area is notable as a zone of several well-used pre-existing tracks and paths, being the main access for recreational visits to the beach. Although lower areas are used for the main axis of the hole, topographic smoothing will be needed. The green is at an altitude of 8m O.D. within an area of higher and more variable mature dune and ridge landforms.

### 2.21 Other Features

The impact on the landforms within the dunes and links of the Menie Estate as a consequence of the construction of the clubhouse, car parking area, putting practice green and driving range area, are as described in the assessment for the previous course layout plans. Connecting paths from greens to tees have now been provided in the latest course layout plan, and will be well-defined, narrow and, sometime, on elevated walkways. These footpaths use pre-existing tracks or use depressions within the intervening topography to minimize additional direct impact and change to the geomorphology of the area. Footbridges will also be needed to cross the Menie and Blairton Burns.

## **4.0 IMPACTS ON HABITAT**

### **4.1 Introduction**

The effects of the golf course development on habitats are covered here in a revised format to that used in the TIGLS Response to Aberdeenshire Council and Statutory Consultations (July 2007). It provides tables of impacts on habitats for individual holes for the course as a whole. It then examines impacts for the Foveran Links SSSI, Foveran Botanical SINS and ground outwith the SSSI and SINS footprint.

The impact analysis involves some changes from details submitted in 2007:

- It uses the Hawtree course (February 2008) submitted to the Inquiry, which includes much more detail than the Fazio course of the 2007 submission. The extra detail covers semi-rough and transition rough, plus bunkers, tees, paths, fairways and greens. For hole by hole analysis, these are aggregated into effects per hole.
- The NVC habitat map of 2006 has been amended to take account of some missed heathland and changes in the discrimination between damp dune heath in slacks and slack habitat. These gaps and changes were identified by SNH (Production 43). The amendments are described elsewhere (Production 55).
- The area considered for analysis has been changed to reflect the extent of wind-blown sand on the development area. This blown sand area has been taken from the limits used in the SNH Sand Dune Vegetation Survey of Scotland (Production 36). This area is important – it defines the limits inland for golf development designed as links courses. The boundary of this blown sand area is mapped in Production 55. The total area for analysis defined in this manner is 263.08 ha.
- Dune habitat types are simplified mainly to NVC community level. In addition habitat types are divided into three sets: key habitats (major dune nature conservation interest), other habitats of moderate interest, and other habitats of low interest. Descriptions of habitats are provided in the 2007 TIGLS Environmental Statement (Chapter 7 and Appendix 7-1).

These changes from 2007 information enable a more accurate description of effects. However, it is important to record that the effects are incomplete. Other golf infrastructure has not yet been designed in detail. This will involve the addition of car parking, maintenance buildings, a second golf course and stabilisation of parts of the southern sand dome at Balmedie. It is not possible to quantify their effects until detailed plans for these components are available at the detailed planning stage.

No ecological assessment of effects is given here. An outline assessment is provided in Production 55. Likewise, mitigation of effects on habitats is covered in Production 56.

A comparison is made between the 2007 Fazio course and the 2008 Hawtree course, to consider their relative merits in relation to effects on habitats. The 2007 Fazio submission lacks the additional detail in the Hawtree design. To ensure comparability the two courses are compared only in terms of fairway and green extents. The comparison is applied to the combination of all 18 holes and the driving range for each course.

## 4.2 Results

Habitat effects are given in Table 1 (Holes 1 – 9), Table 2 (Holes 10-18) and Table 3 (Transition rough for all holes, all holes less transition rough, all holes, club house, driving range and putting green). The area of habitats within the blown sand area is also given, together with area remaining after subtracting losses due to golf development.

It is generally assumed that effects will result in direct habitat loss. However, this is not the case for all transition rough which will be maintained as playable dune habitat, potentially with good nature conservation interest. This explains the discrimination between transition rough and other hole elements in Table 3.

Table 4 summarises golf impacts for Foveran Links SSSI. This includes habitat extents for all of the SSSI, based on a 1990 NVC vegetation survey (Production 23) which was harmonised, digitised and included with other NVC survey on the East Coast of Scotland (Production 36).

Table 5 summarises golf impacts for the botanical Site of Interest to Natural Science (SINS).

Table 6 summarises golf impacts for ground outwith the SSSI and SINS areas

Table 7 compares the 2007 Fazio and 2008 Hawtree courses, summing the effects on habitats for a combination of all 18 holes and the driving range for each course.

## 4.3 Comparison of the Fazio and Hawtree courses

Overall, the Hawtree course achieves a modest reduction (0.9 ha, to 17.8 ha) in habitat loss. The reduction is slightly greater (1 ha) for key habitat types, of major dune interest. Less SD12 acidic grassland and H11b dune heath are lost. Smaller areas of mobile dune vegetation are affected in the Hawtree design, reflecting slight adjustment to the seaward flanks of some holes.

There is a marked increase (0.7 ha) in the Hawtree design for the area of SD13 young dune slack affected. This results from siting Hawtree Hole 15 in a dry slack over ground at the north end which has only recently started to develop slack conditions. The slack floor here is mainly stony glacial till with a thin and variable sand cover.

**Table 1 Direct habitat loss (ha) due to development, Holes 1 to 9**

Habitats	Hole 1	Hole 2	Hole 3	Hole 4	Hole 5	Hole 6	Hole 7	Hole 8	Hole 9	Totals for first course impacts	Habitat totals on blown sand in links zone	Habitat totals remaining (excluding second course impacts)
Bare mobile sand				0.21	0.07					11.14	27.62	16.48
Beach sand		<0.01								<0.01	9.24	9.23
SD6abc mobile dune			0.02	0.05						0.25	13.17	12.91
SD6d mobile dune				0.25	0.18					1.94	19.88	17.94
SD6x or SD7 mobile or semi-fixed dune		<0.01		0.53						1.59	11.73	10.13
SD9a calcareous semi-fixed dune											4.70	4.70
SD12 acidic dune grassland	1.25	1.34	0.40	0.91	0.44	0.21	0.37	1.15	1.95	13.18	67.31	54.12
H11b dry heath	0.41	0.23	0.04	0.13	0.62	0.29	0.49	0.47	0.23	3.35	15.57	12.22
SD13 young dune slack			0.06							1.68	3.79	2.11
SD16 dune slack			0.05							1.23	7.51	6.27
SD16/M15 dune slack - wet heath											0.10	0.10
SS willow scrub	0.01	0.09		0.12				0.13	0.07	0.72	2.06	1.34
SM13/SM16 saltmarsh				<0.01						<0.01	0.14	0.13
<b>Total, key habitats (major dune interest)</b>	<b>1.67</b>	<b>1.67</b>	<b>0.56</b>	<b>2.22</b>	<b>1.30</b>	<b>0.50</b>	<b>0.86</b>	<b>1.75</b>	<b>2.24</b>	<b>35.08</b>	<b>182.78</b>	<b>147.69</b>
Acidic grassland											0.01	0.01
MG10, M23 and rush swamp										0.82	6.67	5.84
Other neutral grassland		<0.01						0.01		0.01	16.39	16.38
OV27 willowherb ruderal											0.83	0.83
S5 sweet grass swamp		0.06		0.10	0.03					0.19	1.47	1.28
Standing water, ditch, stream and swamp		0.10	<0.01	0.05				0.01		0.16	1.67	1.51
W23 gorse scrub	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.31	2.55	2.25
<b>Total, other habitats of moderate interest</b>	<b>&lt;0.01</b>	<b>0.16</b>	<b>&lt;0.01</b>	<b>0.16</b>	<b>0.03</b>	<b>&lt;0.01</b>	<b>&lt;0.01</b>	<b>0.02</b>	<b>&lt;0.01</b>	<b>1.49</b>	<b>29.58</b>	<b>28.09</b>
Arable crops										1.22	30.60	29.38
Buildings, bare ground, garden											1.87	1.87
Improved grassland										0.20	2.12	1.92
Plantation										0.58	3.52	2.94
Track and road	0.13	0.06			0.02	0.02	0.03	0.11	0.06	0.82	4.96	4.14
Ruderals (stock or bird feeding areas)	0.01	<0.01			0.01	<0.01	0.01	0.01	0.02	2.30	7.64	5.34
<b>Total, other habitats of low interest</b>	<b>0.14</b>	<b>0.06</b>			<b>0.03</b>	<b>0.02</b>	<b>0.04</b>	<b>0.12</b>	<b>0.08</b>	<b>5.13</b>	<b>50.71</b>	<b>45.59</b>
<b>Total of habitats</b>	<b>1.81</b>	<b>1.89</b>	<b>0.56</b>	<b>2.38</b>	<b>1.37</b>	<b>0.52</b>	<b>0.90</b>	<b>1.89</b>	<b>2.32</b>	<b>41.70</b>	<b>263.08</b>	<b>221.37</b>

**Table 2 Direct habitat loss (ha) due to development, Holes 10 to 18**

Habitats	Hole 10	Hole 11	Hole 12	Hole 13	Hole 14	Hole 15	Hole 16	Hole 17	Hole 18	Totals for first course impacts	Habitat totals on blown sand in links zone	Habitat totals remaining (excluding second course impacts)
Bare mobile sand	<0.01	0.26	1.57	0.61	0.09	0.55		1.07	0.12	11.14	27.62	16.48
Beach sand										<0.01	9.24	9.23
SD6abc mobile dune					0.18					0.25	13.17	12.91
SD6d mobile dune	0.24	0.08	0.31	0.03	0.20	0.08		0.51	0.05	1.94	19.88	17.94
SD6x or SD7 mobile or semi-fixed dune					1.04	0.01		0.00	0.01	1.59	11.73	10.13
SD9a calcareous semi-fixed dune											4.70	4.70
SD12 acidic dune grassland	1.85	<0.01	0.06	<0.01	0.41	0.16	0.41	0.53	1.44	13.18	67.31	54.12
H11b dry heath	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.20	3.35	15.57	12.22
SD13 young dune slack	0.51				0.01	0.69			0.41	1.68	3.79	2.11
SD16 dune slack	0.30	<0.01	0.17				0.19	0.04	0.49	1.23	7.51	6.27
SD16/M15 dune slack - wet heath											0.10	0.10
SS willow scrub	0.12								0.06	0.72	2.06	1.34
SM13/SM16 saltmarsh										<0.01	0.14	0.13
<b>Total, key habitats (major dune interest)</b>	<b>3.02</b>	<b>0.34</b>	<b>2.12</b>	<b>0.64</b>	<b>1.94</b>	<b>1.50</b>	<b>0.60</b>	<b>2.14</b>	<b>2.78</b>	<b>35.08</b>	<b>182.78</b>	<b>147.69</b>
Acidic grassland											0.01	0.01
MG10, M23 and rush swamp	0.02									0.82	6.67	5.84
Other neutral grassland										0.01	16.39	16.38
OV27 willowherb ruderal											0.83	0.83
S5 sweet grass swamp										0.19	1.47	1.28
Standing water, ditch, stream and swamp										0.16	1.67	1.51
W23 gorse scrub	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.31	2.55	2.25
<b>Total, other habitats of moderate interest</b>	<b>0.02</b>	<b>&lt;0.01</b>	<b>&lt;0.01</b>	<b>&lt;0.01</b>	<b>&lt;0.01</b>	<b>&lt;0.01</b>	<b>&lt;0.01</b>	<b>&lt;0.01</b>	<b>&lt;0.01</b>	<b>1.49</b>	<b>29.58</b>	<b>28.09</b>
Arable crops										1.22	30.60	29.38
Buildings, bare ground, garden											1.87	1.87
Improved grassland										0.20	2.12	1.92
Plantation	<0.01									0.58	3.52	2.94
Track and road	0.10								0.15	0.82	4.96	4.14
Ruderals (stock or bird feeding areas)		2.18	0.05							2.30	7.64	5.34
<b>Total, other habitats of low interest</b>	<b>0.10</b>	<b>2.18</b>	<b>0.05</b>						<b>0.15</b>	<b>5.13</b>	<b>50.71</b>	<b>45.59</b>
<b>Total of habitats</b>	<b>3.14</b>	<b>2.52</b>	<b>2.16</b>	<b>0.64</b>	<b>1.94</b>	<b>1.50</b>	<b>0.60</b>	<b>2.14</b>	<b>2.92</b>	<b>41.70</b>	<b>263.08</b>	<b>221.37</b>

**Table 3 Direct habitat loss (ha) due to development: transition rough, all holes, other infrastructure and dome stabilisation**

Habitats	First Course Transition Rough Holes 1-18	First Course Holes 1-18 excluding Transition Rough	Totals, First Course Holes 1 to 18	Clubhouse	Driving Range	Putting Green	Other Northern Dome stabilisation work	Totals for first course impacts	Habitat totals on blown sand in links zone	Habitat totals remaining (excluding second course impacts)
Bare mobile sand	1.30	3.24	4.54				6.60	11.14	27.62	16.48
Beach sand	<0.01							<0.01	9.24	9.23
SD6abc mobile dune	0.09	0.16	0.25					0.25	13.17	12.91
SD6d mobile dune	0.61	1.32	1.94					1.94	19.88	17.94
SD6x or SD7 mobile or semi-fixed dune	0.42	1.17	1.59					1.59	11.73	10.13
SD9a calcareous semi-fixed dune									4.70	4.70
SD12 acidic dune grassland	2.97	9.92	12.88	0.10	<0.01	0.20		13.18	67.31	54.12
H11b dry heath	0.83	2.28	3.11	0.02	<0.01	0.22		3.35	15.57	12.22
SD13 young dune slack	0.29	1.40	1.68					1.68	3.79	2.11
SD16 dune slack	0.33	0.90	1.23					1.23	7.51	6.27
SD16/M15 dune slack - wet heath									0.10	0.10
SS willow scrub	0.14	0.47	0.61			0.11		0.72	2.06	1.34
SM13/SM16 saltmarsh								<0.01	0.14	0.13
<b>Total, key habitats (major dune interest)</b>			27.84	0.12	<0.01	0.53	6.60	35.08	182.78	147.69
Acidic grassland									0.01	0.01
MG10, M23 and rush swamp	<0.01	0.01	0.02		0.81			0.82	6.67	5.84
Other neutral grassland	<0.01	<0.01	0.01					0.01	16.39	16.38
OV27 willowherb ruderal									0.83	0.83
S5 sweet grass swamp	0.03	0.16	0.19					0.19	1.47	1.28
Standing water, ditch, stream and swamp	0.02	0.14	0.16					0.16	1.67	1.51
W23 gorse scrub	0.05			0.05	0.26	<0.01		0.31	2.55	2.25
<b>Total, other habitats of moderate interest</b>			0.38	0.05	1.06	<0.01		1.49	29.58	28.09
Arable crops					1.22			1.22	30.60	29.38
Buildings, bare ground, garden									1.87	1.87
Improved grassland					0.20			0.20	2.12	1.92
Plantation					0.58			0.58	3.52	2.94
Track and road	0.20	0.47	0.67	0.01	0.10	0.04		0.82	4.96	4.14
Ruderals (stock or bird feeding areas)	0.64	1.64	2.28		0.01	0.01		2.30	7.64	5.34
<b>Total, other habitats of low interest</b>			2.96	0.01	2.11	0.05		5.13	50.71	45.59
<b>Total of habitats</b>	7.92	23.29	31.17	0.18	3.17	0.58	6.60	41.70	263.08	221.37

**Table 4 Direct habitat loss (ha) due to development within Foveran Links SSSI**

Habitat	All SSSI (1990 NVC survey)	NVC 2006/8 SSSI (Menie Estate only)	Golf Development Components in SSSI									Golf Total
			Boardwalk	Bunker	Fairway	Green	Path	Semi Rough	Tee	Transition Rough	Other Dome Stabilisation	
Bare mobile sand	48.67	13.76		0.13	1.61	0.29	0.21	0.64	0.13	1.25	6.60	10.87
Beach sand	17.51	3.10										
SD4	1.13											
SD6abc mobile dune	4.38	3.14		0.01	0.06			0.02		0.09		0.18
SD6d mobile dune	20.53	8.81		0.04	0.42	0.02	0.14	0.23	0.12	0.54		1.51
SD6efg	14.12											
SD6x or SD7 mobile or semi-fixed dune	12.89	5.51		0.02	0.54		0.04	0.17	0.04	0.25		1.05
SD10	0.46											
SD11	0.91											
SD12 acidic dune grassland	18.70	12.45	<0.01	0.04	1.49	0.12	0.19	0.57	0.16	0.76		3.33
H11b dry heath	4.32	0.07										
SD13 young dune slack	0.06	3.59		0.02	0.98	0.04	0.07	0.22	0.01	0.29		1.62
SD16 dune slack	0.34	5.03	0.01	0.02	0.21	<0.01	0.17	0.11	0.06	0.20		0.78
SD16/M15 dune slack - wet heath	2.54											
SD17 dune slack	4.64											
SS willow scrub	0.11	0.16										
<b>Total, key habitats (major dune interest)</b>	<b>151.32</b>	<b>55.62</b>	<b>0.01</b>	<b>0.28</b>	<b>5.31</b>	<b>0.47</b>	<b>0.82</b>	<b>1.96</b>	<b>0.52</b>	<b>3.38</b>	<b>6.60</b>	<b>19.35</b>
Mown fairways	0.08											
MG10, M23 and rush swamp	1.31	3.64	0.01							<0.01		0.02
Other neutral grassland	0.07	0.04										
S5 sweet grass swamp	0.29											
Standing water, ditch, stream and swamp	0.73	0.17										
W23 gorse scrub	<0.01											
<b>Total, other habitats of moderate interest</b>	<b>2.49</b>	<b>3.85</b>	<b>0.01</b>							<b>&lt;0.01</b>		<b>0.02</b>
Arable crops	<0.01											
Buildings, bare ground, garden	0.01											
Improved grassland	0.54											
Mixed plantation		0.25										
Track and road	0.18	0.33		<0.01	0.09			0.02	<0.01	0.02		0.13
Ruderals (stock or bird feeding areas)	0.04	7.26		0.10	1.18	0.07	0.04	0.21	<0.01	0.62		2.23
No label	0.14											
<b>Total, other habitats of low interest</b>	<b>0.90</b>	<b>7.84</b>		<b>0.10</b>	<b>1.27</b>	<b>0.07</b>	<b>0.04</b>	<b>0.22</b>	<b>&lt;0.01</b>	<b>0.65</b>		<b>2.36</b>
<b>Total of habitats</b>	<b>154.71</b>	<b>67.32</b>	<b>0.02</b>	<b>0.38</b>	<b>6.58</b>	<b>0.54</b>	<b>0.86</b>	<b>2.18</b>	<b>0.52</b>	<b>4.03</b>	<b>6.60</b>	<b>21.72</b>

**Table 5 Direct habitat loss (ha) due to development within Foveran Botanical Site of Interest to Natural Sciences (SINS)**

Habitat	SINS NVC 2006/8 Menie Estate	Golf Development Components in SINS									
		Boardwalk	Bunker	Fairway	Green	Path	Semi Rough	Tee	Transition Rough	Other Dome Stabilisation	Total for SINS golf development
Bare mobile sand	13.76		0.13	1.61	0.29	0.21	0.64	0.13	1.25	6.60	10.87
Beach sand	3.29										
SD6abc mobile dune	5.08		0.01	0.06			0.02		0.09		0.18
SD6d mobile dune	8.79		0.04	0.42	0.02	0.14	0.23	0.12	0.54		1.50
SD6x or SD7 semi-fixed dune	6.15		0.02	0.54		0.04	0.17	0.04	0.25		1.06
SD9a calcareous semi-fixed dune	0.54										
SD12 acidic dune grassland	19.40	<0.01	0.06	2.35	0.12	0.25	0.76	0.18	1.12		4.83
H11b dry heath	0.47		0.01	0.07	0.02		0.03		0.07		0.20
SD13 young dune slack	3.59		0.02	0.98	0.04	0.07	0.22	0.01	0.29		1.62
SD16 dune slack	6.39	0.01	0.02	0.34	0.07	0.21	0.16	0.07	0.31		1.19
SS willow scrub	0.75		<0.01	0.04	0.01	0.03	0.04	0.01	0.05		0.18
<b>Total, key habitats (major dune interest)</b>	<b>68.22</b>	<b>0.01</b>	<b>0.30</b>	<b>6.41</b>	<b>0.56</b>	<b>0.95</b>	<b>2.26</b>	<b>0.56</b>	<b>3.97</b>	<b>6.60</b>	<b>21.62</b>
MG10, M23 and rush swamp	3.56	0.01							<0.01		0.02
Other neutral grassland	4.10										
Standing water, ditch, stream and swamp	0.21										
W23 gorse scrub	0.34										
<b>Total, other habitats of moderate interest</b>	<b>8.21</b>	<b>0.01</b>							<b>&lt;0.01</b>		<b>0.02</b>
Arable crops	0.13										
Buildings, bare ground, garden	0.02										
Plantation	0.68					<0.01					<0.01
Track and road	0.81		<0.01	0.12	<0.01	<0.01	0.03	<0.01	0.09		0.24
Ruderals (stock or bird feeding areas)	7.29		0.10	1.18	0.07	0.04	0.21	<0.01	0.62		2.23
<b>Total, other habitats of low interest</b>	<b>8.93</b>		<b>0.10</b>	<b>1.30</b>	<b>0.07</b>	<b>0.04</b>	<b>0.23</b>	<b>&lt;0.01</b>	<b>0.72</b>		<b>2.47</b>
<b>Total of habitats</b>	<b>85.36</b>	<b>0.02</b>	<b>0.40</b>	<b>7.70</b>	<b>0.63</b>	<b>1.00</b>	<b>2.49</b>	<b>0.57</b>	<b>4.69</b>	<b>6.60</b>	<b>24.11</b>

**Table 6 Direct habitat loss (ha) due to development outwith Foveran Links SSSI and Foveran Botanical SINS**

Habitat	Windblown sand area outwith SSSI and SINS	Golf Development Components outwith SSSI and SINS									Golf Total
		Boardwalk	Bunker	Clubhouse	Fairway	Green	Path	Semi Rough	Tee	Transition Rough	
Bare mobile sand	13.85				0.07	0.07	0.04	0.04	0.01	0.05	0.27
Beach sand	5.94									<0.01	<0.01
SD6abc mobile dune	8.08						0.05	0.01	0.01		0.07
SD6d mobile dune	11.06		0.01		0.12	0.01	0.03	0.14	0.05	0.07	0.43
SD6x or SD7 semi-fixed dune	5.58				0.22		<0.01	0.13	0.01	0.17	0.53
SD9a calcareous semi-fixed dune	4.16										
SD12 acidic dune grassland	47.19	<0.01	0.17	0.10	3.39	0.34	0.50	1.56	0.32	1.93	8.32
H11b dry heath	15.10	<0.01	0.07	0.01	1.30	0.18	0.16	0.59	0.11	0.71	3.14
SD13 young dune slack	0.20				0.02	0.03		0.01			0.06
SD16 dune slack	1.12				0.02			0.01		0.02	0.05
SD16/M15 dune slack - wet heath	0.10										
SS willow scrub	1.31		0.01		0.28	0.05	0.01	0.11		0.09	0.54
SM13/SM16 saltmarsh	0.14	<0.01					<0.01				<0.01
<b>Total, key habitats (major dune interest)</b>	<b>113.83</b>	<b>&lt;0.01</b>	<b>0.26</b>	<b>0.11</b>	<b>5.41</b>	<b>0.67</b>	<b>0.80</b>	<b>2.61</b>	<b>0.52</b>	<b>3.03</b>	<b>13.43</b>
Acid grassland	0.01										
MG10, M23 and rush swamp	2.75				0.62	0.04			0.15		0.81
Other neutral grassland	12.29						<0.01	<0.01		<0.01	0.01
OV27 willowherb ruderal	0.83										
S5 sweet grass swamp	1.47	0.02	<0.01		0.11		<0.01	0.02		0.03	0.19
Standing water, ditch, stream and swamp	1.46	<0.01	<0.01		0.11		<0.01	0.03		0.02	0.16
W23 gorse scrub	2.21	<0.01	<0.01	0.04	0.24	0.01	<0.01	<0.01	<0.01	<0.01	0.30
<b>Total, other habitats of moderate interest</b>	<b>21.01</b>	<b>0.03</b>	<b>&lt;0.01</b>	<b>0.04</b>	<b>1.09</b>	<b>0.05</b>	<b>0.01</b>	<b>0.05</b>	<b>0.15</b>	<b>0.05</b>	<b>1.47</b>
Arable crops	30.48				1.11	0.05			0.06		1.22
Buildings, bare ground, garden	1.85										
Improved grassland	2.12				0.18	0.02					0.20
Plantation	2.79				0.48	0.03			0.07		0.58
Track and road	4.11		0.01	0.01	0.28	0.02	0.05	0.08	0.02	0.11	0.58
Ruderals (stock or bird feeding areas)	0.33		0.01		0.03	<0.01	0.00	0.02		0.01	0.07
<b>Total, other habitats of low interest</b>	<b>41.67</b>		<b>0.01</b>	<b>0.01</b>	<b>2.08</b>	<b>0.13</b>	<b>0.05</b>	<b>0.10</b>	<b>0.14</b>	<b>0.13</b>	<b>2.65</b>
<b>Total of habitats</b>	<b>176.52</b>	<b>0.03</b>	<b>0.28</b>	<b>0.18</b>	<b>8.58</b>	<b>0.85</b>	<b>0.85</b>	<b>2.77</b>	<b>0.81</b>	<b>3.21</b>	<b>17.56</b>

**Table 7 Direct habitat losses (ha) of Fazio and Hawtree courses, combining 18 fairways and greens plus driving range for each design**

Habitat Type	Fazio Course 2007 Greens and Fairways	Hawtree Course February 2008 Greens and Fairways
Bare mobile sand	0.35	2.04
SD6abc mobile dune	0.19	0.06
SD6d mobile dune	1.09	0.56
SD6x or SD7 semi-fixed dune	1.92	0.75
SD12 acidic dune grassland	8.25	6.20
H11b dry heath	1.69	1.57
SD13 young dune slack	0.36	1.07
SD16 dune slack	0.42	0.43
SS willow scrub	0.14	0.37
<b>Total, key habitats (major dune interest)</b>	<b>14.05</b>	<b>13.05</b>
MG10, M23 and rush swamp	0.78	0.66
Other neutral grassland	0.01	
S5 sweet grass swamp	0.02	0.11
Standing water, ditch, stream and swamp	0.03	0.11
W23 gorse scrub	0.15	0.26
<b>Total, other habitats of moderate interest</b>	<b>1.00</b>	<b>1.14</b>
Arable crops	0.51	1.16
Improved grassland	0.02	0.20
Mixed plantation	0.89	0.51
Track and road	0.56	0.42
Ruderals (stock or bird feeding areas)	1.27	1.28
<b>Total, other habitats of low interest</b>	<b>3.25</b>	<b>3.58</b>
<b>Total of affected habitats</b>	<b>18.64</b>	<b>17.77</b>