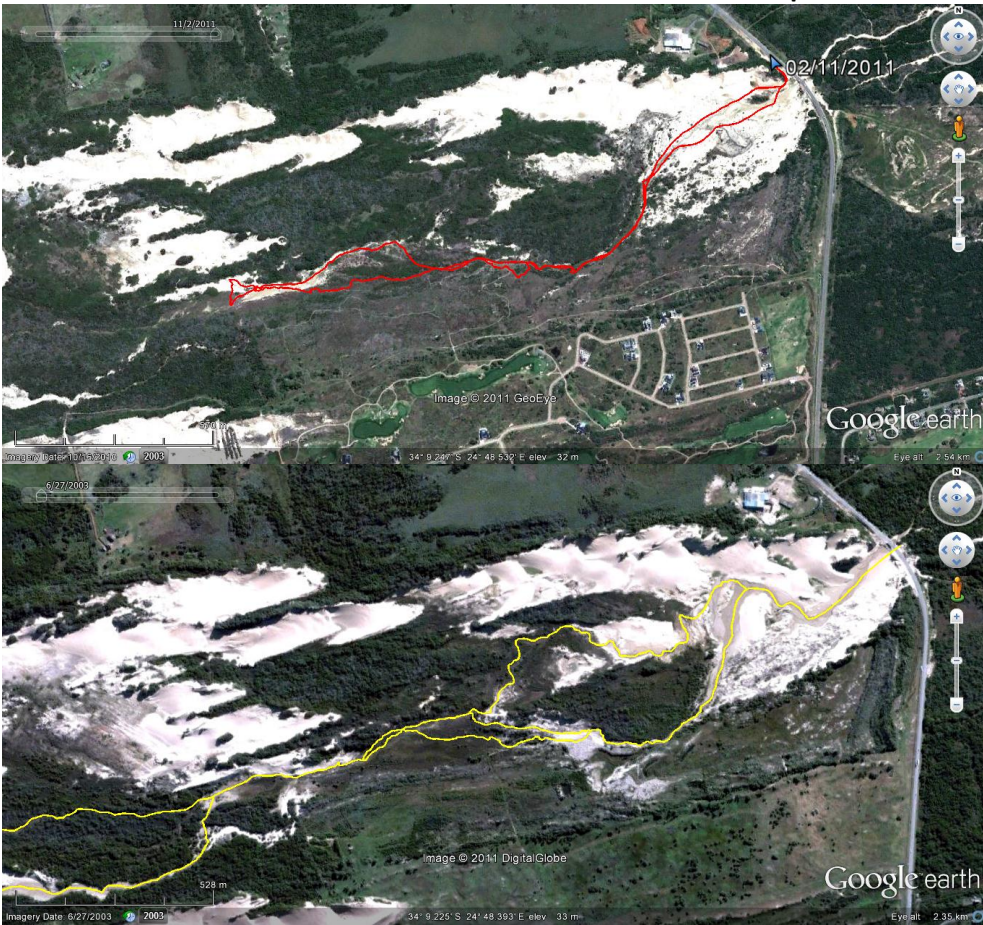


**Infinity Consulting**  
**Sandriver Middle Reaches**

**General Geological and Environmental  
Observations.**  
**Compiled by Frank Silberbauer**  
**November 2011**

**Overview Maps**



The Google image (imagery date 16 October 2010) below shows the tracks taken on this trip. The tracks follow the mid-point of the current flow of the main Sandriver channel.

The Google image (imagery date 27 June 2003) below shows the main flow channels of the Sandriver at this time. The main difference of note is the flow of the river north of the present channel, and the flow through the wetland area is further north than the present channel.



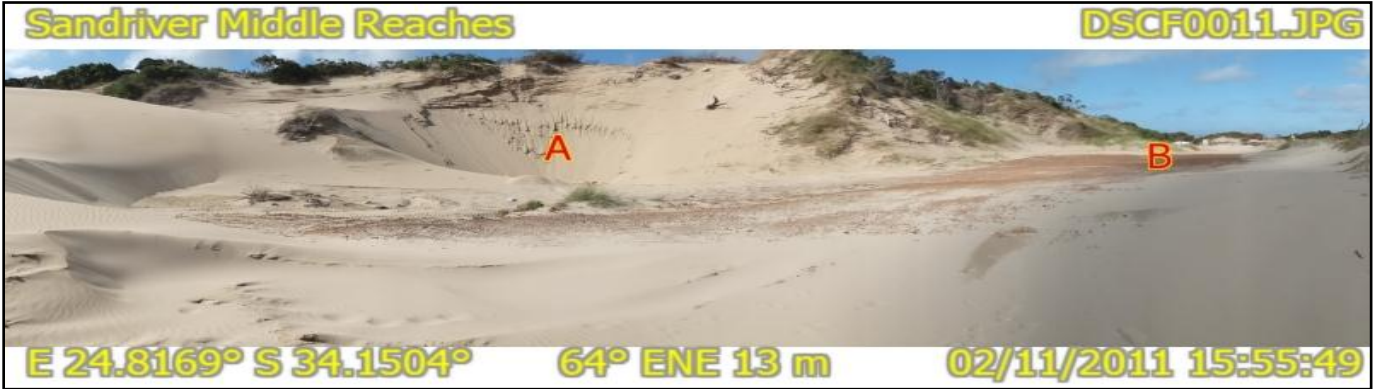
The Google image shows the positions of slides taken on the bottom causeway section of the Sandriver.



The arrows show the positions of the slides discussed in this report. The two points in red are the GPS coordinates of photos 794 & 797 taken by Dr. Ellery. This section is adjacent to 'Lionel's Dam'



The upper areas covered by this report known as the wetland area. The positions of the slides taken are shown in yellow.



Attributes	
Title	Sandriver Middle Reaches
Comment	A = New Sandmine excavations B = Previous Sandmine excavations. If those excavating this sandmine remove the remaining dune marked A then the result could impact on the viability of the proposed new bridge as one would be opening up the 'throat' to a spread of flow during periodic flood events. Consequent flooding of a much wider area downstream would result if this happened thus increasing the potential threat to properties on the other side of the main road.
Latitude	S 34.1504°
Longitude	E 24.8169°
Elevation	13 m
Photo Direction	64° ENE
Date Time Stamp	02/11/2011 15:55:49
File Name	DSCF0011.JPG



Attributes	
Title	Sandriver Middle Reaches
Comment	The two Google images above show a close view of the Sandriver sandmine on the left 2003 and the right 2010. The yellow areas show how the main mining areas have shifted over 8 years. If the dune where the 2010 mining is removed, it is probable that a much greater area along the MR381 road will be exposed to potential flooding. This is a cause of concern as if such a situation develops a much wider area below the road will be vulnerable to flooding. This fact could also have implications on the design of the proposed new bridge over the Sandriver.



#### Attributes

Title	Sandriver Middle Reaches
Comment	General view up stream with the split between 'Lionel's Dam' on the left and the main flow channel of the Sandriver on the right in the far centre. The exact dates of this breach is not known but it could have been during the 1996 floods.
Latitude	S 34.1550°
Longitude	E 24.8116°
Elevation	18 m
Photo Direction	291° WNW
Date Time Stamp	02/11/2011 16:08:43
File Name	DSCF0012.JPG



<b>Attributes</b>	
Title	Sandriver Middle Reaches
Comment	View into the breach of 'Lionel's Dam' from the main flow channel. The section on the right shows a layered stratigraphy varying between a grey calcium rich band which is believed to be an old Pleistocene landsurface overlying wind blown dune sand.
Latitude	S 34.1551°
Longitude	E 24.8112°
Elevation	18 m
Photo Direction	225° SW
Date Time Stamp	02/11/2011 16:10:17
File Name	DSCF0013.JPG

Title	Sandriver Middle Reaches
Comment	View into the breach of 'Lionel's Dam' from the main flow channel. The section on the right shows a layered stratigraphy varying between a grey calcium rich band which is believed to be an old Pleistocene landsurface overlying wind blown dune sand.
Latitude	S 34.1551°
Longitude	E 24.8112°
Elevation	18 m
Photo Direction	225° SW
Date Time Stamp	02/11/2011 16:10:17
File Name	DSCF0013.JPG



Attributes	
Title	Sandriver Middle Reaches
Comment	A detailed view of the right / northern bank of the breach of 'Lionel's Dam'. On closer inspection the top dark layer consists of disturbed material lying over a dark thin humic horizon, with the dune sand below. It is postulated that the top dark layer represents materials excavated from the main body of the dam and mechanically placed the previous sand dune landsurface.
Latitude	S 34.1550°
Longitude	E 24.8112°
Elevation	19 m
Photo Direction	225° SW
Date Time Stamp	02/11/2011 16:11:13
File Name	DSCF0015.JPG



Attributes	
Title	Sandriver Middle Reaches
Comment	View of the south (left) bank of the breach of 'Lionel's Dam'. This opposite view reveals a common stratigraphy of this area of windblown dune sand. The darker layer visible at the bottom is wet and represents a firm band of wind blown of water transported dune sand.
Latitude	S 34.1550°
Longitude	E 24.8111°
Elevation	19 m
Photo Direction	40° NE
Date Time Stamp	02/11/2011 16:11:22
File Name	DSCF0016.JPG



#### Attributes

Attributes	
Title	Sandriver Middle Reaches
Comment	Section cut on the south bank of Sandriver of the northern sandriver face wall of 'Lionel's Dam'. This section is close to that recorded by Dr. Ellery in photos 794 and 797. This section is a cut on the northern side of the dam wall eroded by the Sandriver. The top material is extensively disturbed and overlies a humic rich horizon consisting of plant material consistent with the Acacia sp being aliens that infested this area in the recent past. Underlying this humic band is windblown or water transported dune sand.
Latitude	S 34.1551°
Longitude	E 24.8103°
Elevation	21 m
Photo Direction	183° S
Date Time Stamp	02/11/2011 16:13:46
File Name	DSCF0017.JPG





<b>Attributes</b>	
Title	Sandriver Middle Reaches
Comment	A close up view of the previous slide 18 being the top member being a gray quartzitic clay sand indispersed with calcrete nodules not greater than 20mm in diameter. Root intrusion is evident. The face has been trimmed with a trowel.
Latitude	S 34.1551°
Longitude	E 24.8103°
Elevation	20 m
Photo Direction	183° S
Date Time Stamp	02/11/2011 16:14:29
File Name	DSCF0018.JPG



<b>Attributes</b>	
Title	Sandriver Middle Reaches
Comment	Close up of section of the bottom member of the section in slide 17. It is evident that the material described in the previous slide 18 overlies a material which originated from the top layer of a pan or exposed basin. The underlying humic vegetated layer shows materials clearly identifiable which have not reached an advanced stage of decomposition which top the underlying dune sands. It is suggested that these deposits represent excavated materials from the dam on the other side of this berm / wall.
Latitude	S 34.1551°
Longitude	E 24.8103°
Elevation	20 m
Photo Direction	183° S
Date Time Stamp	02/11/2011 16:14:46
File Name	DSCF0019.JPG

Sandriver Middle Reaches

DSCF0020.JPG



E 24.8102° S 34.1550°

183° S 21 m

02/11/2011 16:15:20

## Attributes

Title	Sandriver Middle Reaches
Comment	This is a view of the cut of the same berm but further upstream providing a closeup view of the top overburden.
Latitude	S 34.1550°
Longitude	E 24.8102°
Elevation	21 m
Photo Direction	183° S
Date Time Stamp	02/11/2011 16:15:20
File Name	DSCF0020.JPG



<b>Attributes</b>	
Title	Sandriver Middle Reaches
Comment	A further cut 18m upstream of the same berm a closeup being a closeup view of the exposed section.
Latitude	S 34.1549°
Longitude	E 24.8100°
Elevation	20 m
Photo Direction	183° S
Date Time Stamp	02/11/2011 16:16:02
File Name	DSCF0021.JPG



#### Attributes

Attributes	
Title	Sandriver Middle Reaches
Comment	A 120 degree panoramic view of 'Lionel's Dam' with the north berm on the left of the slide. This berm was constructed with a TLB and excavator and materials were dumped on top of the area separating the dam from the Sandriver to protect the dam area from the Sandriver. (M. Donnelly pers comm) The sections shown on the previous slides 17 to 21 are a result of erosion cuts on along this area as a result of periodic flooding along the Sandriver on the northern face of this berm. As this dam represents an area of approx 1HA excavated to a depth of 3 to 4m it is logical that the north wall would have to be built up to withstand any intrusion of the main channel of the Sandriver. The above Google image gives the location of the dam area.
Latitude	S 34.1551°
Longitude	E 24.8098°
Elevation	20 m
Photo Direction	104° ESE
Date Time Stamp	02/11/2011 16:18:51
File Name	DSCF0022.JPG



Attributes	
Title	Sandriver Middle Reaches
Comment	A closeup view of the north dam berm / wall. The slope is consistent of an angle which would allow heavy machinery to move materials from the base of the dam to the top of the north berm.
Latitude	S 34.1552°
Longitude	E 24.8095°
Elevation	21 m
Photo Direction	89° E
Date Time Stamp	02/11/2011 16:20:32
File Name	DSCF0023.JPG



#### Attributes

Attributes	
Title	Sandriver Middle Reaches
Comment	Slide 24 is a close up view of the breached portion of 'Lionel's Dam'. The Google imagery date is 2003 and the area surrounding the dam area is still devoid of vegetation providing evidence that earth moving activities were conducted over the area of the section slides shown previously. It is probable that this breach occurred at the intersection of excavated material and natural sand dune as shown in Slides 15 and 16 which would have been a 'weak point' in the dam wall. The breach would have occurred soon after a rain event which would have filled the dam and 'topped' the lowest point in the wall and emptied into the Sandriver. This phenomenon of dune topping is common within the dune bypass system when dune bays fill up and overflow taking the sand materials downstream.
Latitude	S 34.1552°
Longitude	E 24.8095°
Elevation	21 m
Photo Direction	89° E
Date Time Stamp	02/11/2011 16:20:42
File Name	DSCF0024.JPG



Attributes	
Title	Sandriver Middle Reaches
Comment	What remains of a timber structure set up post the 2006/7 floods to slow down the head cut which was endangering the wetland area further upstream. The force of the 2011 floods has removed the main portion of this structure.
Latitude	S 34.1548°
Longitude	E 24.8086°
Elevation	21 m
Photo Direction	15° NNE
Date Time Stamp	02/11/2011 16:23:10
File Name	DSCF0025.JPG



26 & 27



**Attributes**

Title	Wetland area slides 26 & 27
Comment	Slide 26 shows a view up what was the original main course of the Sandriver. The 2006/7 floods caused a head cut to form at point A and the consequent 2011 floods the head cut has migrated upriver to point B. This area is of environmental significance as an endemic population of <i>Merxmuellera cincta</i> (Nees) Conert subsp. <i>cincta</i> (Slide 27 above), a Red Data species is now threatened due to the head cut which is draining the wetland area shaded green on the above 2003 Google image. There is also evidence of peat deposits and this area and a rare species of Sand Toad known to frequent this area.
Latitude	S 34.1555°
Longitude	E 24.8042°
Elevation	26 m
Photo Direction	256° WSW
Date Time Stamp	02/11/2011 16:32:30
File Name	DSCF0026.JPG



Attributes	
Title	Sandriver Middle Reaches
Comment	A view downstream showing the upper reaches of the head cut which is now filled in with windblown sand. This channel is now blocked and the Sandriver has moved to the north away from this area.
Latitude	S 34.1556°
Longitude	E 24.8026°
Elevation	28 m
Photo Direction	45° NE
Date Time Stamp	02/11/2011 16:38:01
File Name	DSCF0032.JPG

Sandriver Middle Reaches

DSCF0033.JPG



Attributes	
Title	Sandriver Middle Reaches
Comment	The build up of sand as a result of the wind has closed off the previous 'Old' flow channel the flow channel has now moved to the left around the wetland area.
Latitude	S 34.1555°
Longitude	E 24.8021°
Elevation	29 m
Photo Direction	95° E
Date Time Stamp	02/11/2011 16:39:08
File Name	DSCF0033.JPG



<b>Attributes</b>	
Title	Sandriver Middle Reaches
Comment	A view of a Pleistocene land surface which has been exposed by the shifting of the flow channel of the Sandriver in this area.
Latitude	S 34.1556°
Longitude	E 24.8015°
Elevation	28 m
Photo Direction	78° ENE
Date Time Stamp	02/11/2011 16:40:21
File Name	DSCF0034.JPG



Attributes	
Title	Sandriver Middle Reaches
Comment	A clear view of a section of the landsurface shown in the previous slide (34)
Latitude	S 34.1556°
Longitude	E 24.8013°
Elevation	28 m
Photo Direction	6° N
Date Time Stamp	02/11/2011 16:41:46
File Name	DSCF0035.JPG

A Patella sp. shell exposed as a result of water and wind erosion on the Pleistocene landsurface.



Attributes	
Title	Sandriver Middle Reaches
Comment	A Patella sp. shell exposed as a result of water and wind erosion on the Pleistocene landsurface.
Latitude	S 34.1555°
Longitude	E 24.8013°
Elevation	29 m
Photo Direction	24° NNE
Date Time Stamp	02/11/2011 16:43:23
File Name	DSCF0036.JPG

A similar view of timber which are present within this landsurface.



Attributes	
Title	Sandriver Middle Reaches
Comment	A similar view of timber which are present within this landsurface.
Latitude	S 34.1557°
Longitude	E 24.8011°
Elevation	29 m
Photo Direction	10° N
Date Time Stamp	02/11/2011 16:44:24
File Name	DSCF0037.JPG

A view across the flow channel of the section cut showing the dune sands which overlay the Pleistocene land surface, represented by the dark band at the bottom.



Attributes	
Title	Sandriver Middle Reaches
Comment	A view across the flow channel of the section cut showing the dune sands which overlay the Pleistocene land surface, represented by the dark band at the bottom.
Latitude	S 34.1559°
Longitude	E 24.8005°
Elevation	31 m
Photo Direction	178° S
Date Time Stamp	02/11/2011 16:46:24
File Name	DSCF0038.JPG

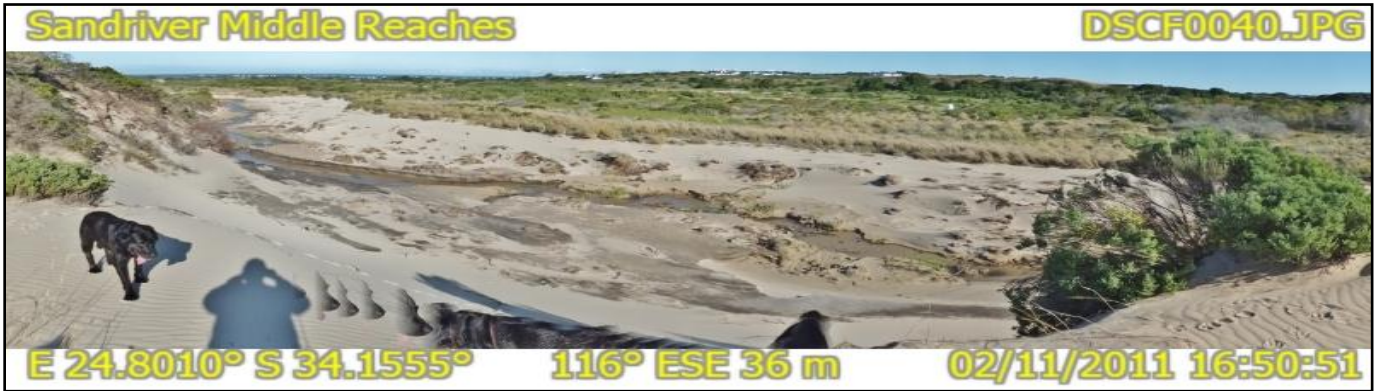


Another view of the same with a downstream angle.



Attributes	
Title	Sandriver Middle Reaches
Comment	Another view of the previous slide 38 with a downstream angle.
Latitude	S 34.1558°
Longitude	E 24.8005°
Elevation	31 m
Photo Direction	80° E
Date Time Stamp	02/11/2011 16:46:33
File Name	DSCF0039.JPG

An elevated view of the area discussed in the previous slides.



Attributes	
Title	Sandriver Middle Reaches
Comment	An elevated view of the area discussed in slides 35 to 37.
Latitude	S 34.1555°
Longitude	E 24.8010°
Elevation	36 m
Photo Direction	116° ESE
Date Time Stamp	02/11/2011 16:50:51
File Name	DSCF0040.JPG

Ditto as previous but a close up.



Attributes	
Title	Sandriver Middle Reaches
Comment	Ditto as previous but a close up.
Latitude	S 34.1555°
Longitude	E 24.8012°
Elevation	32 m
Photo Direction	113° ESE
Date Time Stamp	02/11/2011 16:51:52
File Name	DSCF0043.JPG

A fragment of a calcarious sheath covering of a root. These are common in this area.



Attributes	
Title	Sandriver Middle Reaches
Comment	A fragment of a calcarious sheath covering of a root. These are common in this area.
Latitude	S 34.1555°
Longitude	E 24.8017°
Elevation	27 m
Photo Direction	74° ENE
Date Time Stamp	02/11/2011 16:53:18
File Name	DSCF0044.JPG

A view downstream at the confluence of the 'Old' and 'New' flow channel.

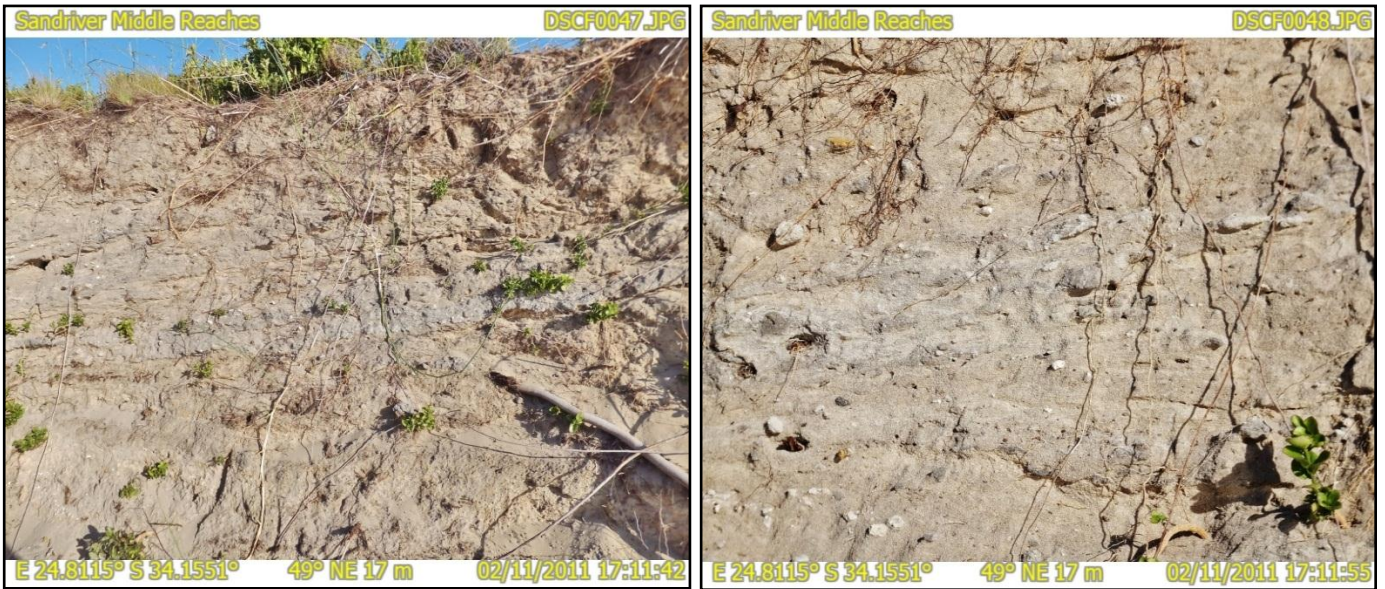


Attributes	
Title	Sandriver Middle Reaches
Comment	A view downstream at the confluence of the 'Old' (to the right rear of slide) and 'New' flow channel (foreground).
Latitude	S 34.1550°
Longitude	E 24.8070°
Elevation	21 m
Photo Direction	85° E
Date Time Stamp	02/11/2011 17:03:05
File Name	DSCF0045.JPG

A Red Lipped Herald snake taking a sunny swim in the Sandriver - there was no effort to get too close to its mouth check if the ID was correct.



Attributes	
Title	Sandriver Middle Reaches
Comment	A Red Lipped Herald snake taking a sunny swim in the Sandriver - there was no effort to get too close to its mouth check if the ID was correct.
Latitude	S 34.1549°
Longitude	E 24.8096°
Elevation	18 m
Date Time Stamp	02/11/2011 17:07:27
File Name	DSCF0046.JPG

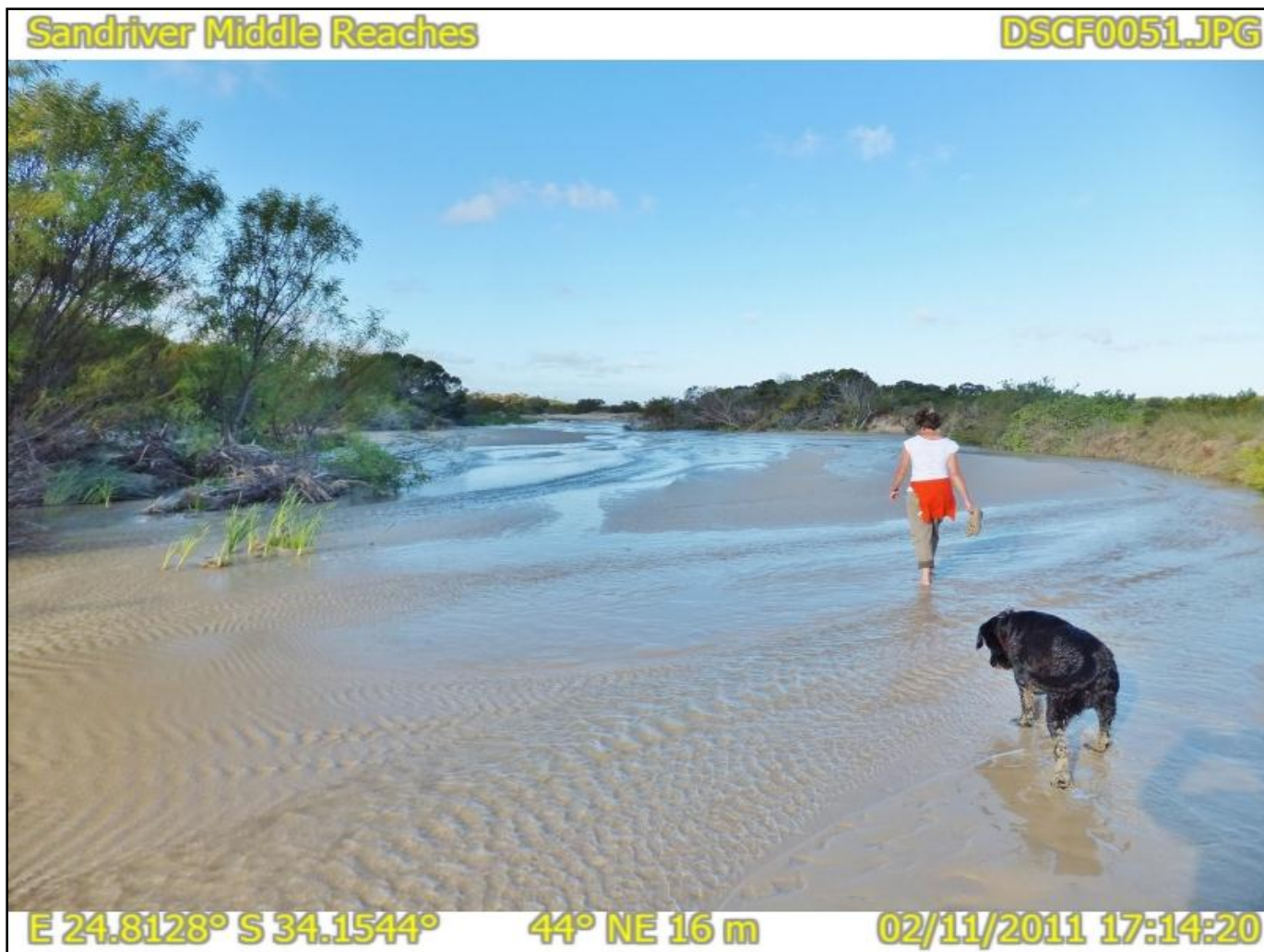


Attributes	
Title	Sandriver Middle Reaches
Comment	A further view of the sediments revealed in a cut on the south bank of the main flow channel. This location is situated 40m downstream of the confluence of the Breach and the main flow channel. Slide 48 shows a close up of the same.
Altitude	S 34.1551°
Longitude	E 24.8115°
Elevation	17 m
Photo Direction	49° NE
Date Time Stamp	02/11/2011 17:11:42
File Name	DSCF0047.JPG & DSCF0048.JPG



Attributes	
Title	Sandriver Middle Reaches
Comment	A more general view of the same further 68m downstream.
Latitude	S 34.1549°
Longitude	E 24.8117°
Elevation	16 m
Photo Direction	52° NE
Date Time Stamp	02/11/2011 17:12:28
File Name	DSCF0049.JPG





Attributes	
Title	Sandriver Middle Reaches
Comment	The main flow channel of the Sandriver broadens and flattens out at this point.
Latitude	S 34.1544°
Longitude	E 24.8128°
Elevation	16 m
Photo Direction	44° NE
Date Time Stamp	02/11/2011 17:14:20
File Name	DSCF0051.JPG

Ditto as previous with the northern dune of the sand mine in the distance.



<b>Attributes</b>	
Title	Sandriver Middle Reaches
Comment	Ditto as previous with the northern dune of the sand mine in the distance.
Latitude	S 34.1525°
Longitude	E 24.8140°
Elevation	13 m
Photo Direction	38° NE
Date Time Stamp	02/11/2011 17:18:23
File Name	DSCF0052.JPG

View towards from further down to moving to the east where the causeway is situated.



Attributes	
Title	Sandriver Middle Reaches
Comment	View towards from further down to moving to the east where the causeway is situated.
Latitude	S 34.1518°
Longitude	E 24.8151°
Elevation	13 m
Photo Direction	44° NE
Date Time Stamp	02/11/2011 17:20:22
File Name	DSCF0053.JPG

View of the temporary causeway over the Sandriver.



Attributes	
Title	Sandriver Middle Reaches
Comment	View of the temporary causeway over the Sandriver.
Latitude	S 34.1510°
Longitude	E 24.8171°
Elevation	11 m
Photo Direction	54° NE
Date Time Stamp	02/11/2011 17:23:43
File Name	DSCF0054.JPG