

HERITAGE IMPACT ASSESSMENT OF THE PROPOSED LOURENS RIVER FLOOD ALLEVIATION SCHEME

Prepared for

Crowther Campbell & Associates

August 2000



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EXECUTIVE SUMMARY

The Archaeology Contracts Office of the University of Cape Town was commissioned by Crowther Campbell & Associates to investigate the possible impacts that the proposed Lourens River Flood Alleviation Scheme (phases 1-3) would have on heritage resources. The history of human usage of the river has been studied and areas of potential sensitivity have been identified. Findings of the assessment are summarised below.

- Palaeontological material in the form of a bed containing extinct shell species found at the mouth of Lourens River may be impacted and should be mitigated by a palaeontological sampling programme before construction work begins.
- Archaeological material in the form of 3 Late Stone Age shell middens near the mouth of Lourens River may be impacted and should be mitigated by an archaeological sampling programme before construction work begins.
- The Lourens River itself is a historically important landscape feature, which has been a focus of prehistoric and historic settlement. It was a centre of early colonial farming which stimulated the development of the village of Somerset West as well as one of the country's earliest major industrial developments (AECI). Maintenance of the river along its existing course and re-instatement or improvement of the riverine landscape will positively mitigate impacts to the river in its capacity as an historic landmark.
- Of some 30 irrigation furrows dating as early as the 18th century, and known to have existed in the earlier part of the 20th century between Vergelegen and the river mouth, the remains of some 8-9 have been tentatively identified. Many of these furrows have been badly maintained and seldom function. Although the furrows are of local historical significance, the gravity of the potential flooding problem outweighs the need to conserve what remains of the furrow *lead-offs*. In instances where water rights to furrows still exist, measures will have to be taken to ensure that the furrows continue to be able to function (water right holders need to be identified). This is especially true with respect to the Melck Sloot where water from this furrow irrigates lands and supports water levels in Paardevlei.
- The Lourens River Bridge, which marks the crossing point of the old Cape Flats wagon road, is considered to be a unique historical structure and has been declared a National Monument. At present, it forms a bottleneck in the river due to its limited flow capacity. Four options have been suggested with respect to increasing capacity. These vary from removal and reconstruction of the bridge in a less critical area, to creating a bypass or adding an extra culvert. This study favours an option that will not involve removing the bridge from its present location, however the South African Heritage Resources Agency has suggested that all options should be presented to the Western Cape Regional Committee.
- The possible impacts of the proposed diversion canal (phase 2) are difficult to assess due to the fact that the route lies under developed land for much of the way. Site inspections before construction work and periodic monitoring during excavation of the canal and culvert are recommended.
- Impacts associated with the flood attenuation dam proposed at Radloff Park include possible damage to disused furrows and Morgenster land. It must be noted that the whole farm (including lands) of Morgenster is a declared National Monument and protected. The South African Heritage Resources Agency will need to be a role player if incorporation of Morgenster land is envisaged.
- In conclusion, it is accepted that the potential flooding threat which may put property and lives at risk will require intervention and therefore will result in necessary impacts to some limited heritage resources. This must be balanced against a possible scenario where catastrophic flooding of the Lourens River will do enormous damage to a wide range of sensitive historic structures within the predicted 50 year flood level.

CONTENTS

EXECUTIVE SUMMARY	2
CONTENTS	3
1. INTRODUCTION	4
1.2 Applicable legislation	4
1.2.1 The SAHRA grading system	4
1.2.2 Useful definitions (as per Heritage Resources Act of 1999)	6
1.3 Terms of Reference	6
1.4 Restrictions to the study	7
2. ASSESSMENT PROCEDURE	7
3. DESCRIPTION OF AFFECTED ENVIRONMENT	8
4. THE GENERAL HERITAGE POTENTIAL OF SOMERSET WEST	9
4.1 National Monuments	9
4.2 Other known heritage sites (not declared)	9
5. IDENTIFICATION OF RISKS	10
5.1 Phase 1 – upgrading of the Lourens River	10
5.1.1 Palaeontological material	10
5.1.1.1 Impacts to palaeontological material	10
5.1.2 Prehistoric archaeological sites	10
5.1.2.1 Impacts to LSA middens	11
5.1.3 Historic landscapes - The Lourens River	12
5.1.3.1 Impacts to the Lourens River as an historic landmark	12
5.1.4 Historic places	13
5.1.5 Irrigation furrows	13
5.1.5.1 Melck <i>sloot</i>	13
5.1.5.2 Island furrow	14
5.1.5.3 Fagan Street furrow	14
5.1.5.4 Hills furrow	14
5.1.5.5 Perry and Kerk <i>sloots</i>	14
5.1.5.6 Hendriks <i>sloot</i>	14
5.1.5.7 Voorbrug furrow and Morkels furrow	15
5.1.5.8 Impacts to furrows	15
5.1.6 Historic Lourens River Bridge	15
5.1.6.1 History	16
5.1.6.2 Options for treatment of the historic bridge	17
5.1.6.3 Legal requirements	19
5.1.6.4 Most favoured mitigation option	19
5.1.7 The Morgenster gates	20
5.1.7.1 Mitigation	20
5.2 Phase 2 - the Flood DIVERSION canal	20
5.2.1 Mitigation	20
5.3 Phase 3 – the flood attenuation dam	21
5.3.1 Mitigation	21
6. RECOMMENDED MANAGEMENT ACTIONS	21
6.1 Palaeontological material	21
6.2 Late Stone Age shell Middens	22
6.3 The Lourens River as an historic landscape	22
6.4 The furrow system	22
6.5 The historic bridge	23
6.6 Morgenster entrance	23
6.7 Phase 2 DIVERSION CANAL	23
6.8 phase 3 attenuation dam	23
6.9 Unexpected archaeological remains	23
7. DISCUSSION AND RECOMMENDATIONS	24
8. REFERENCES	26
APPENDIX A	29
1. INTRODUCTION	29
2. CHRONOLOGY OF EVENTS	29

1. INTRODUCTION

The Archaeology Contracts Office (ACO) of the University of Cape Town was commissioned by Crowther Campbell & Associates to conduct a heritage impact assessment of Phases 1-3 of the proposed Lourens River Flood Alleviation Scheme. Hydrological studies have indicated that the current flow rate of the Lourens River is significantly inadequate in terms of coping with a 1:20 flood. Such an event would result in substantial property damage while a 1:50 year flood would be catastrophic. For this reason it is necessary to investigate ways to increase the flow capacity of the Lourens River to lessen the threat to lives and property.

The Lourens River not only attracted populations of indigenous Khoekhoe people but was an early area of settlement during the Dutch occupation of the Cape. The archaeology of this past is sensitive and could easily be impacted by modifications to the river. The role of the ACO has been to assess the impacts that may result to heritage resources in those parts of the river that are going to require intervention. This report assesses in detail the impact that Phase 1 of the project will have on heritage resources, and also comments on the possible impacts of phases 2 and 3.

1.2 APPLICABLE LEGISLATION

On April 1 2000 the National Heritage Resources Act of 1999 became effective. This legislation defines the kinds of heritage resources that are protected by the act and are considered to be part of the "National Estate". The act also defines the powers of the National Heritage Resources Agency (previously the National Monuments Council), the kinds of protections and procedures that are in place and penalties that may be imposed in instances of contravention. Essentially any alteration, change or demolition of a heritage site may only take place once a permit issued by the heritage authority is in place.

The South African Heritage Resources Agency is known by the acronym "SAHRA". This term is used from here onwards in this document.

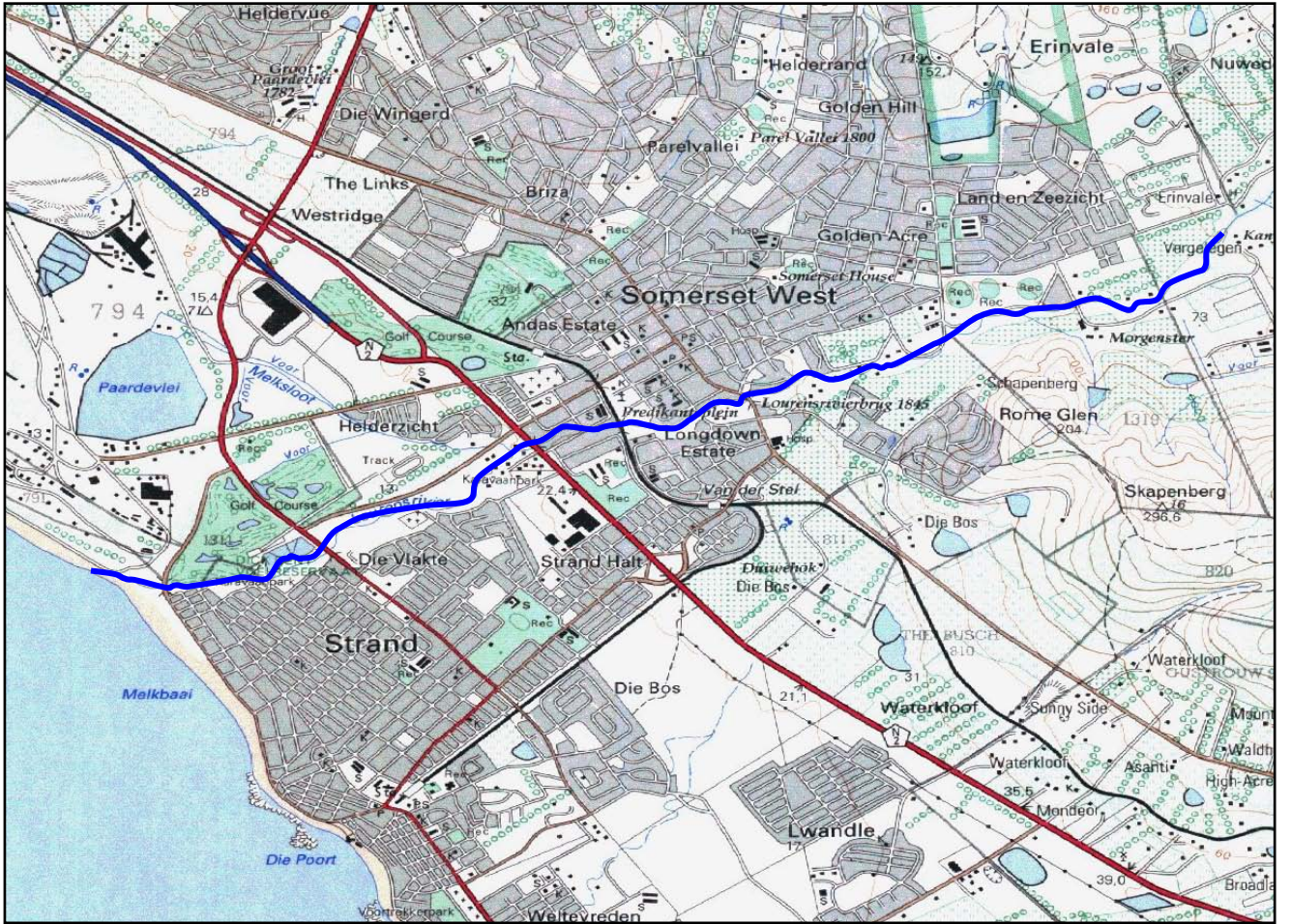
1.2.1 The SAHRA grading system

The Heritage Resources Act prescribes a grading system to be used in the assessment of any heritage object or site. The SAHRA grading system is as follows:

(a) Grade I: Heritage resources with qualities so exceptional that they are of special national significance;

(b) Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or region; and

(c) Grade III: other heritage resources worthy of conservation (in this report we have used grade 3 to indicate heritage resources of moderate significance, but nevertheless protected by legislation).



1.2.2 Useful definitions (as per Heritage Resources Act of 1999)

"Archaeological" means - *material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.* This means that an archaeological site is any area where there are artefacts (objects made by human hand) that are over 100 years of age. An archaeological find is therefore any object or collection of objects made by human hand that is over 100 years old. This can range from ancient stone tools to the contents of historic rubbish dumps containing ceramic shards and bottles.

"Structure" means - *any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.* Protected structures are those which are over 60 years old.

"Palaeontological" means - *any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.* The term fossil means mineralised bones of animals, shellfish, plants, marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

1.3 TERMS OF REFERENCE

The terms of reference provided by the client to the Archaeology Contracts Office are as indicated below:

This study will aim at establishing the archaeological and cultural significance of any features in the Lourens River corridor that would be affected by the proposed flood alleviation measures and assess the impact of the proposed project on those features. The study area is defined as being from Morgenster Bridge, downstream to the estuary.

Specifically, in terms of this study the specialist will:

- Describe the archaeological and historical context and features of the river corridor that would be affected by the proposed flood alleviation measures;
- Indicate these features on the aerial photographs provided for the study
- Indicate the significance of these features, paying specific attention to any "hot spots" or "red flag" areas within the broader study area that could have a significant bearing on the flood alleviation measures;
- Discuss the principles for the conservation of places of cultural significance as established by the South African Heritage Resources Agency in the context of the present project
- Provide a range of archaeological sensitivities for the study area and indicate various mitigatory measures that would be needed for each;
- Assess the status and significance of any impacts, from an archaeological perspective, resulting from the proposed project;
- Assess the status and significance of any impacts, from an archaeological perspective, if the proposed project were not to proceed; the "No go" option;
- Recommend mitigatory measures to protect and maintain any valuable archaeological and historical sites which may exist;

- To specifically address the proposal of removing and possibly relocating the Historic Bridge in the vicinity of Main Road; and
- Provide guidance for the requirements of any necessary permits from SAHRA that might become necessary.

1.4 RESTRICTIONS TO THE STUDY

Restrictions to the study were encountered in three areas. The first of these was the paucity of documentary evidence concerning the history and construction of irrigation furrows (built mostly during the 19th century) that led water from the Lourens River to various agricultural lands. The map that is available dates to the 1930s and is not true to scale.

The second difficulty was the identification of the “lead-off” points of the furrows and determining the routes that they followed. The banks of the river have been subject to modification by human and natural forces which have obscured some of the “lead-off” points. Furthermore, furrows that once existed have been obscured by modern urban development. It is hoped that members of the public who are familiar with the furrow systems may be able to furnish additional information.

There are a number of declared National Monuments within the Somerset West area and other known sites of significance. Since no complete heritage conservation studies have been completed in the Somerset West area at large, there are likely to be other buildings and sites that have not yet been identified. The third difficulty is that although a list of known significant sites is included in this report, the location information provided by SAHRA is incomplete - street addresses or co-ordinates are not provided.

2. ASSESSMENT PROCEDURE

Obtaining information for this study was done by two different methods: namely archival research and field verification. Since the landscape surrounding the Lourens River has been subject to extensive alteration and urbanisation, especially during the 19th and 20th centuries, we have relied heavily on written historical records to lead us to areas of potential historical significance. To this end, a significant proportion of the research for this study has taken place in the Cape Archives and major libraries. Much of the time spent in the Cape Archives in an attempt to learn more about the furrows and *leiwater* systems of the river, but sources were difficult to come by. We have supplemented the study with information from a previous study focusing on the lower reaches of the Lourens river, below the town (Hart and Halkett 1996). The combination has allowed us to understand the Lourens River as an historic landscape along with other associated features, within the historical context of the South Western Cape. Examination of historic records and maps allowed us to isolate a number of places along the river which appear to be significant or had significance in the past.

The next phase of the project was to search the banks of the river (where possible) paying particular attention to areas which are specifically mentioned in the historic records. In order to do this we relied on extensive use of map overlays and GPS technology. Any features that we were able to identify were plotted on colour aerial photographs provided by the client and assigned co-ordinates.

3. DESCRIPTION OF AFFECTED ENVIRONMENT

The affected environment is the lower reaches of the Lourens River extending from the Morgenster Bridge to the mouth. Phase 1 of the project will involve widening and deepening the Lourens River, while Phase 2 involves construction of a diversion canal partially routed below surface to carry excess water in times of flood. Phase 3 involves construction of a flood attenuation dam at Radloff Park. The area of concern in phase 1 is the immediate riverine environment comprising the river itself and the protected natural areas on both sides, the route of the canal and the site of the dam at Radloff Park. Under certain circumstances impacts could have implications/repercussions on areas away from the river. We have attempted to identify these.

The Lourens River is an historic landmark in that it has attracted human occupation since prehistoric times. This is evident not only through archaeological sites but also the accounts of European visitors to the area during the historic period (post 1652). During the Dutch East India Company (DEIC) period at the Cape, the river was a focus for the establishment of a number of early farms as well as a DEIC outpost to protect the borders of the fledgling colony. Central to the history of the area, is the farm Vergelegen which was granted to Willem Adriaan van der Stel in 1700. After he was recalled to the Netherlands on corruption charges in 1707, the farm was confiscated and divided into 4 portions, now the farms Morgenster, Erinvale, Lourensford and Oatlands. The core area of Somerset West is situated on what used to be part of the farm Cloetesburg, originally the most south westerly portion of Vergelegen. The river east of Vergelegen was mostly included within the farm Paardevlei, which was owned by Francois van der Stel, brother of Willem Adriaan van der Stel. Together, the Van der Stel brothers owned virtually the entire length of the Lourens River between Vergelegen and False Bay. A later land-owner was Martin Melck who held Eisenburg as well as several properties in Cape Town.

Although the Dutch Reformed Church has existed since 1819, the town of Somerset West (named after Lord Charles Somerset) was formally laid out in 1822. By 1842 a cluster of gabled houses lined the main road, most of which have been demolished. Accelerated growth of settlement (small holdings and market gardening) took place in the late 19th century along the banks of the Lourens River forming the core of the town of Somerset West. Lands along the river were irrigated with a multitude of furrows, a few of which are still visible and in use. The establishment of the nearby De Beers explosive factory in the late 19th century boosted development of the town. This factory (once the biggest factory in the country) was positioned so that it could make use of water from the river, as well as ship out products from a proposed anchorage in the shelter of Gordon's Bay. Somerset West was linked to Cape Town by a well used informal road that led across the flats. The road passed over the Lourens River before crossing the Hottentots Hollands Mountains, then into the interior of the colony via Caledon, Swellendam and eventually Graaff Reinet. Due to frequent flooding of the Lourens River, a bridge was built over the river in 1845. This bridge, which is one of the oldest surviving structures of its kind in the country (referred to in this report as the "historic bridge"), is no longer in use but remains structurally sound.

At present the Lourens River flows directly through the town of Somerset West. Most of the river bank is public open space with a riverside trail. Much of the area is picturesque, the banks are well wooded and the river, on first appearance, is "unspoiled". Since recorded history, it is known that the river has been subject to seasonal flooding which has increased with surface hardening and run-off from the nearby urban areas. The banks of the river, although un-canalised, have been subject to periodic maintenance and remodelling. A

number of furrows built during the 19th and early 20th centuries are still visible in places, but seldom follow the original routes as indicated on early maps of the area. The most prominent and important of these is the Melck *sloot*, which is maintained and operational.

The historic human use of the river is evident in a number of features ranging from “places” to bridges, which may be impacted by the envisaged flood alleviation scheme. These, and associated risks are identified below.

4. THE GENERAL HERITAGE POTENTIAL OF SOMERSET WEST

The actual village of Somerset West has been heavily impacted in terms of heritage conservation, and the original character of the town has been significantly eroded (Fransen and Cook 1980). Despite this, a number of significant places and structures have survived. These include 23 declared National Monuments in and around the town. In addition to these, there are a number of other identified sites and structures that are considered to be conservation-worthy. It must be emphasised that it is very likely that further sites could be identified as no comprehensive heritage assessments of the area have been completed. A list of National Monuments and other known heritage sites is presented below.

4.1 NATIONAL MONUMENTS

Old bridge over the Lourens River
The Camphor trees at Vergelegen (Vergelegen house is not declared)
Old pass over the Hottentots Holland (Gantouw)
Dovecott, Farm 811, Onverwacht
Old Dutch Reformed Church
Groot Paardevlei
Parel Vallei
Farm Vergenoegd (Faure)
Dwelling house and watermill at Knorhoek
Magistrates building
Police Station building
Coachmans House
Somerset House
Morgenster (out-buildings, lands and entranceway)
Sweet Safraan, Sir Lowry's Pass Village
Quinan House (AECI)
Navarre, Farm Marsheden 557, Firgrove
Old Parsonage, (Reitz), Lourens Street
Land-en-Zeezicht, 15 Verster Avenue
Old Railway Station, Sir Lowrys Pass Village
Predikants Plein, Faure
House, cnr Victoria and Reitz Streets

4.2 OTHER KNOWN HERITAGE SITES (NOT DECLARED)

Cloetesburg – circa 1756, highly altered farm house, now private school
Methodist church and manse – cnr Andries Pretorius and Church Streets
Somerset Oaks, Main Road
45 Victoria Street

27 Victoria Street
29 Victoria Street
Victoria Street Precinct
Vergelegen Farm House, gardens and outbuildings
Vergelegen Archaeological sites (slave lodge, mill, wine cellar, dovecote) dating to circa 1700
Erinvale, highly altered farm house and outbuildings
Farm Goedverwachting (now Appelgarth)
Farm De Fortuin (now Broadlands)
Farm Rome
Office complex (Sir Herbert Baker designed), AECI
Selected AECI historic industrial structures.

5. IDENTIFICATION OF RISKS

5.1 PHASE 1 – UPGRADING OF THE LOURENS RIVER

Several categories of heritage sites were found during the assessment. These include: palaeontological material, Late Stone Age archaeological sites, historic structures, irrigation furrows, *sloots*, historic landscapes.

5.1.1 Palaeontological material

Palaeontological material in the form of deposits of fossil shellfish have been noted very close to the mouth of the Lourens Rivers on AECI property (Hart and Halkett 1996). The material dates from a period of raised sea level that may relate to the mid-Holocene high sea level (3000 BP) or the earlier Eemian high sea level (120 000 BP). The deposits, which contain locally extinct warm water shell species (*Solen capensis*) have not been subject to any formal study or dating. The material lies below the bed of the Lourens River just inland of the mouth.

5.1.1.1 Impacts to palaeontological material

- a) *Nature of impact.* The deposits may be disturbed or exposed by earthmoving activities required to widen, or deepen the river mouth.
- b) *Extent of Impact.* Local. The impact is local but could be extensive depending on the amount of earthmoving activities required.
- c) *Duration of impact.* Permanent. By virtue of the fact that palaeontological material can never be replicated or replaced, the impact will be permanent.
- d) *Intensity of Impact.* High. Since the extent of the sub-surface material is not known, the intensity of the impact must be judged to be high.
- e) *Probability of occurrence.* High. Any form of excavation in the river mouth will impact the material.
- f) *Legal requirements.* All palaeontological material is protected by the Heritage Resources Act of 1999. A permit must be obtained before disturbance of the deposit is to take place.
- g) *Significance.* Medium. Mitigation of impacts is possible without changing engineering options.
- h) *Status of impact.* Negative without mitigation. Positive with mitigation.
- i) *Confidence.* Medium.

5.1.2 Prehistoric archaeological sites

Very little prehistoric archaeological material was found in the immediate vicinity of the river despite the fact that artefacts dating to the Early and Middle Stone Age have been recorded

on nearby AECI lands. The most sensitive area is the mouth of the Lourens River where three Late Stone Age archaeological sites have been found.

The Late Stone Age (LSA) shell middens were located in cleared firebreaks in the coastal zone close to the south side of the Lourens River mouth. The survey showed that most of the coastal dune system has been subject to disturbance related to factory activities. Notwithstanding the disturbance, LSA occupation of this area appears to have been marginal. Although fresh water would have been available from the Lourens River, the nearest coastal rock outcrops which would have provided LSA people with staple food in the form of shellfish, are a number of kilometers to the south east at the Strand and Gordon's Bay. The mouth of the Lourens River would have also have been attractive to prehistoric people who would have visited the area to obtain water birds and estuarine fish when the seasons and tides were favourable. A short summary of the sites follows below.

i) Site 1: This is a small scatter of artefacts and shell midden situated on the dune close to a redundant watch tower behind the factory hostel area. Visible artefactual material includes a silcrete adze and flakes of silcrete, quartzite and quartz. Associated shell consists of *Patella sp*, *Argobuccinum postulosum* and *Choromytilus meridionalis*.

ii) Site 2: This midden has been exposed in a ploughed firebreak between the factory area and the road to the Strand. Silcrete flakes and Cape Coastal Pottery are present but the shell sample (of which the archaeological component appears to be *Patella sp*) has become mixed with much older estuarine species that have been brought up by ploughing.

iii) Site 3: This is a portion of a very thin lens of midden eroding out of a dune that has been cut through by the firebreak. Fragments of pottery and *Patella sp* are present.

SAHRA Significance: *Grade 3 – regional significance*. Although these sites have been disturbed to some extent, they are among the only remaining LSA coastal assemblages between Gordon's Bay and Macassar that could produce archaeological samples.

5.1.2.1 Impacts to LSA middens

- a) *Nature of impact*. Disturbance of any one of the sites by earthmoving machinery will destroy and/or damage the context of the archaeological material.
- b) *Extent of Impact*. Local. The extent of the physical impact will be localised.
- c) *Duration of impact*. Permanent. Archaeological sites can never be replaced.
- d) *Intensity of Impact*. High, if impacted by earthmoving machinery.
- e) *Probability of occurrence*. High, if earthmoving activities take place close to the sites.
- f) *Legal requirements*. Archaeological sites are specifically protected by the South African Heritage Resources Act of 1999. The act requires that any archaeological material that is to be impacted by development activities be assessed and mitigated to the satisfaction of SAHRA before permits for alteration or destruction are awarded. It is likely that SAHRA will require systematic excavation and radio-carbon dating of the sites before flood alleviation begins, to recover information which may otherwise be lost.
- g) *Significance*. Medium. Although the sites are not worthy of specific conservation or major engineering operations designed to avoid impacts, potential information about the past may be lost if the sites are not subject to systematic mitigation procedures before any construction work begins.
- h) *Status of impact*. Negative. Widening of the Lourens River estuary may impact the sites through complete or partial destruction by earthmoving machinery. A positive outcome of

mitigation will be an opportunity to sample and date the thus adding to local knowledge of the area.

- i) *Confidence*. Medium. Major earthmoving activities on the south bank of the river are likely to impact on one or more of the archaeological sites.

5.1.3 Historic landscapes - The Lourens River

The examination of the history of the Lourens River has revealed that it has played a significant role in the region's history. During the 17th century it marked the outer limit of the DEIC hegemony based in Cape Town. An informal wagon road stretched from Cape Town over the sandy Cape flats. At the point where it forded the Lourens River, the Dutch East India Company built a substantial outpost, armed with cannon and garrisoned by soldiers. Slaves housed at the outpost tended a number of vegetable gardens and pastures on the banks of the River, which was considered well suitable for supporting agriculture. The Valley also supported a number of free burgher farms, namely Vergelegen, Parel Vallei and Paardevlei. Water led off the river powered mills, irrigated fields, fed Paardevlei lake and provided water to one of South Africa's oldest manufacturing industries – the De Beers explosives factory (established in the late 1800s) - a major stimulus in the growth of the town of Somerset West.

Due to the central role played by the Lourens River in the development of Somerset West, the river itself may be described as a core feature in the area's historic landscape and is considered to be a regionally significant heritage resource. At the same time a river is acknowledged to be a dynamic system, ever changing as a result of natural forces and human intervention over time, and was never a static entity in history. Minor alterations and human intervention in its history have been part of its character, and future changes can be considered to be a continuation of this process.

5.1.3.1 Impacts to the Lourens River as an historic landmark

- a) *Nature of impact*. At present the river follows a meandering course through the town and for much of its way provides the area with a restful and natural ambience although its course has been subject to numerous adjustments and minor diversions. The dynamic nature of the river means that it is impossible to define its "original" course as both human and environmental factors have impacted continuously on its movement. The present character of the river is mainly due to fact that it is surrounded by open land and subject to few artificial barriers or concrete canalisation. The very real flooding problem necessitates modifying the river in such a way as to allow a greater water volume capacity. This will require earthmoving to deepen or widen the river. This will impact river banks, the local environment, and in particular structures such as bridges, furrow "lead-offs", or any structures in the immediate vicinity of the river. Such work if undertaken with the necessary sensitivity, may result in an improvement of the riverine environment.
- b) *Extent of Impact*. Local. The physical impact will be on the immediate riverine area.
- c) *Duration of impact*. Temporary. In time the river banks will re-vegetate and the river will continue to serve as an historic landmark.
- d) *Intensity of Impact*. Low. Provided that the river is not deviated from its current course, its significance as an historic landmark will be unaffected.
- e) *Probability of occurrence*. Medium, the impact is expected to be of a temporary aesthetic nature, after which the ambience of the river will recover.
- f) *Legal requirements*. Historic landscapes are protected by the South African Heritage Resources Act of 1999. SAHRA should be kept informed of developments.

- g) *Significance*. Medium. While the status of the river is of regional importance, ensuring that that the riverine environment is improved/conserved will retain or enhance its significance.
- h) *Status of impact*. Neutral-positive. The act of deepening or widening the river is not considered to be a negative impact to the local historic landscape provided that the work is carried out in such a way that will allow the river to “mature” into its surroundings, thus maintaining the ambience of the area. Positive impacts will be achieved by developing the riverside trail into an informative experience. Signage situated at strategic points could highlight the known history of its role in the local landscape.
- i) *Confidence*. High.

5.1.4 Historic places

Although the lower reaches of the Lourens River were granted as farmland in the late 17th / early 18th centuries, very few structures were built in these areas. Apart from remnants of irrigation furrows, no ruins or historic buildings were noted in the public open space surrounding the river. The site of the original Dutch East India outpost has never been verified, however we believe that it was situated on the south bank of the river very close to the historic Lourens River Bridge. This being the case, the site is now taken up by a modern housing complex and shopping center and has probably been seriously impacted.

5.1.5 Irrigation furrows

The history of the development of an extensive complex of irrigation furrows and *sloots* that led water from the Lourens River has never been well researched or well understood. Since the banks of the river were farmed from the late 1700s, it must be assumed that the practice has a very long local history. It is known that Willem Adriaan Van der Stel led several mill races off the Lourens river at Vergelegen to power a forge and watermill. Martin Melck constructed the Melck *sloot* in the latter half of the 18th century to top up the water in Paardevlei, which he was using as a fish farm. A municipal sketch map of the Somerset West area shows at least thirty individual furrows that led off the river between Vergelegen and the estuary. Of these, the possible traces of 8 furrows were located down river from Morgenster. According to historic documents, some of these were extensive following contours for several kilometers in length and changing names according to the landowners through whose grounds they ran. Municipal plans of 1939 indicate that many of the furrows were altered when the street system of the town was hardened and formalised. Some of the furrows were given cement linings and diverted along the sides of the streets (Perry *sloot*, Fagan *sloot* and Kerk *sloot*). Other systems were probably abandoned or destroyed once small-holdings along the river were subdivided and turned into residential development.

Tracing the furrows along the Lourens River proved to be very difficult. Their courses differed substantially from those indicated on the only available map (1935) indicating that the routes that the furrows followed were often changed and not formally mapped or documented. Only the Melck *sloot* is indicated on any modern maps of the area. Alterations to the river banks have obscured the original “lead-off” points, while some furrows now appear to serve as drains, bringing run-off into the river instead of diverting water out. The furrows we have tentatively identified to date are listed and described below.

5.1.5.1 Melck *sloot*

The Melck *sloot* derives from the original furrow dug by Martin Melck in the late 18th Century. Although the route of the furrow has had some alterations in the past, it stills serves its original purpose in that it feeds water into Paardevlei (used by Martin Melck for breeding

“*springers*”) and irrigates nearby lands. The *sloot* is extensive, regularly maintained and in use. Until recently, water from Paardevlei was used by AECl in the operation of the factory’s power-station. Today the *sloot* maintains Paardevlei as a permanent water body – a haven for water birds and other aquatic life.

5.1.5.2 Island furrow

Island furrow was once a water-course that split the flow of the Lourens River by leading water off the river and returning it down-stream. The area of Somerset West known as “The Island” is the portion of land that was enclosed by the furrow. Remnants of Island furrow are still visible in open land just east of the railway bridge. Parts of the furrow have been maintained indicating that it has been in partial use in the recent past – a point confirmed in the scoping document feedback section. The furrow is clearly visible along the borders of the riverside open space and at the point where it goes under a culvert in the railway, and thereafter disappears into suburbia. The inconsistencies in the modern erf boundaries show the original route of the furrow, which in the earlier part of this century was considered an important enough feature to delimit property boundaries. For most of its route the furrow is not clearly visible. We were able to identify the point at which it used to rejoin the river, but no physical traces of the furrow are visible on the land surface at present.

5.1.5.3 Fagan Street furrow

The beginning of the Fagan Street furrow lies directly under the historic bridge. A small weir was built over the Lourens River to control the water level so that water was available to feed the furrow if so required. The entrance of the furrow has been cement lined and carefully led under the modern bridge immediately downstream of the historic bridge. The furrow disappears into an underground conduit and later emerges and runs along the edge of Fagan Street in a cement-lined conduit. No water was running in the furrow at the time of inspection, although the furrow appears to be in working condition.

5.1.5.4 Hills furrow

The beginning of what we assume to have been the Hills furrow lies in a private garden that immediately borders the river. The original “lead-off” has been replaced with a modern concrete weir. The furrow is visible where it crosses a nearby orchard, after which is diverted into a sub-surface conduit. The furrow has been maintained and lined with cement in places. According to a local informant, some residents still have rights to water although these rights are seldom exercised.

5.1.5.5 Perry and Kerk *sloots*

According to the 1935 municipal map, the Perry and Kirk *sloots* shared a single lead-off point on the river and diverted almost immediately. During the survey we identified a point close to Radloff Park where a furrow appears to have led off the river. The feature is in a poor state and currently seems to serve for drainage leading surface run-off into the river. The point at which the Perry and Kirk *sloots* diverged remains visible but neither is in working order. Both are overgrown and silted up.

5.1.5.6 Hendriks *sloot*

We were unable to identify the starting point of the Hendriks *sloot*, however, the remnants of what appear to be a furrow are visible running through private land towards the Morgenster entrance road. The furrow is no longer in service and heavily overgrown and silted up.

5.1.5.7 Voorbrug furrow and Morkels furrow

A complex of furrows led off the Lourens River very close to the eastern boundary of Morgenster farm. These include Gunn's Furrow, Morkels Furrow, and Voorbrug Furrow. Portions of the extensive Voorbrug Furrow are still visible on aerial photographs, however, the beginning of the furrows were not visible and are now in or under ploughed fields.

5.1.5.8 Impacts to furrows

- a) *Nature of impact.* Increasing the flow capacity of the river will involve deepening the riverbed and alteration of the banks. This will impact the furrows in two ways. The "lead-off" points of the furrows will be impacted by earthmoving and will be damaged. Deepening of the river will render inoperable those furrows that still have the capacity to function, unless weirs are built to raise water levels to an appropriate height. Of particular concern is the Melck *sloot*, which if rendered non-functional will cause a chain of impacts culminating into the loss of flow into Paardevlei. This may have a serious adverse effect on the aquatic life of the vlei.
- b) *Extent of Impact.* Local – widespread. For the main part, physical impacts to the furrows will be confined to the lead-off points along the river. However, the effect of rendering the furrows in-operable through deepening the river bed, will cause impacts all the way up those furrows that are still operational. This will extend to persons who still have rights to use water from the furrows and to aquatic life found therein.
- c) *Duration of impact.* Permanent. Without mitigatory measures, the impacts will be permanent. The effect of rendering furrows in-operable will cause them to be redundant. Once redundant they will lose significance and will eventually be lost through lack of maintenance.
- d) *Intensity of Impact.* High. Initial physical impacts will be intense while eventual loss of significance of the furrows will be slow and long term.
- e) *Probability of occurrence.* High. It is very likely that impacts to the furrows will occur. The exception is the Fagan Street furrow which will not be affected if the historic bridge is not rebuilt or moved.
- f) *Legal requirements.* The furrows, which may be defined as "structures" over 60 years of age, are protected by the South African Heritage Resources Act of 1999. A permit must be obtained for their alteration or demolition.
- g) *Significance.* Medium – high. While the furrows themselves are of local significance to the area and not of major regional or national significance, the impacts that could result from loss of operation of furrows such as the Melck *sloot* are of high significance.
- h) *Status of impact.* Negative without mitigation. Neutral with mitigation.
- i) *Confidence.* Medium. Status of some of the furrows is unclear, system of furrows is poorly mapped and not well understood.

5.1.6 Historic Lourens River Bridge

The terms of reference for this study asked that we pay specific attention to the Lourens River Bridge. The historic bridge is a serious concern with respect to the alleviation of the flood waters that pass down the Lourens river. The historic bridge is currently proving to be a restriction and lacks the necessary flow capacity. This means that consideration must be paid to either removing the bridge, extending it, or diverting the peak flow of water to prevent flooding. These factors imply that impacts to the bridge are going to be inevitable. The task is to find the best option to minimise the possible impacts on the historic fabric. The history of the bridge is described and the impacts of the various engineering options are discussed.

5.1.6.1 History

The building of the bridge is closely connected with the expansion of 19th century British influence into the interior and the need to improve the communication routes between the different regions of the growing colony.

Under the governorship of Sir George Napier, the Central Road Board (CRB) was established in 1843 and it operated until 1859. The duties of the CRB were “to improve and bring into fit and proper state the main roads throughout the colony ...”. The first Board consisted of John Montague, Harry Rivers, Charles Cornwallis Mitchell (SG, Civil engineer and Superintendent of Works at the Cape of Good Hope 1828-1848), John Bondwell Ebdon and Joseph Black.

One of the first tasks of the CRB was authorising the construction of a hard road from Cape Town over the Cape Flats as far as the Eerste River. This road was constructed between 1843 and 1845. Tackling the soft shifting sands of the Cape Flats in many ways proved more trying than the mountain passes.

An architect, WS Chauncey was appointed to supervise the construction of bridges over the Palmiet, Bot and Lourens rivers in 1844. During this period bridges were also being constructed over the Eerste River (at Faure) and over the Keur River on the old Montague pass. These 5 bridges were the first permanent structures of their kind to be built in South Africa and only two remain:

Eerste River Bridge:	Only the stone piers and some abutments remain
Lourens River Bridge:	Complete, although no longer in use
Palmiet River Bridge:	Completely destroyed by flood water action
Bot River Bridge:	Original abutments remain, but has complete concrete deck
Keur River Bridge:	On the Old Montague Pass, was declared a National Monument in 1970 and is still in use.

Mitchell submitted plans for the Lourens River Bridge to the Board on 29 August 1844 and was authorised to employ “artificers, miners and labourers ... from 1 September 1844”. The building of the bridge went smoothly. The suggestion by the Inspector of Works, Mr Skirrow, that the stone arches be replaced by a teakwood deck on a stone pier (as was the Eerste River Bridge) was rejected on the grounds that the construction of the bridge was too advanced to make any alterations in the plans. The opening of the bridge was advertised in the Cape of Good Hope Government Gazette of 20 June 1845. While the bridge was in use, it was popularly known as the “Military Bridge”.

The Lourens River Bridge was built of Table Mountain Sandstone and consisted of two arch spans of 17 ft 6 in each with a single traffic roadway of 12 ft clear. On the downstream face, between the two arches and above the single pier, is a rectangular stone set into the work with the name of the CRB and the date of construction of the bridge in roman numerals. On the other side of the bridge there is another stone, very much weathered, but the initials WSC can be made out – possibly standing for WS Chauncey, the architect of the bridge.

In 1938 a new bridge was built and opened just down-stream of the old bridge. The Lourens River Bridge was declared a National Monument and was closed to vehicular traffic.

In April 1952, the old bridge featured in the tercentenary celebration of the landing of Jan van Riebeeck. A 6 ft wide strip of wet concrete was laid across the middle of the bridge and an

old-fashioned post cart drawn by six horses rode across the bridge to the Eastern Cape. The imprints of the horses' hooves and the cart wheels can still be seen.

5.1.6.2 Options for treatment of the historic bridge

The bridge is a unique structure in the Southern African context. On the basis of its age, construction method and historical context it may be given a Grade 1 rating in terms of the requirements of Heritage Resources Act of 1999. In terms of the National Monuments Act of 1969 as amended, the bridge has been declared a National Monument. This means that the bridge is already given specific legal protection. It may not be altered in any way without a permit from SAHRA. The severe flooding problems that have been caused by the lack of capacity of the bridge are going to require intervention, despite the fact the bridge is a declared monument. The challenge is to achieve this with as few impacts as possible and with the approval of the legislative body. To date, four options for the treatment of the historic bridge have been proposed. These are detailed and discussed below.

Option 1. Trans-location and reconstruction

This would involve systematically dismantling the bridge, stone by stone and re-erecting it in a less critical area. This complex procedure would involve ensuring that the bridge retains its appearance after reconstruction. The individual stones would have to be carefully mapped and numbered for accurate reconstruction.

Positive impacts

- The physical structure of the bridge would be saved, and moved to a location where it could be brought back into use.

Negative Impacts

- Although dismantlement and relocation is possible, achieving this on structures made of stone is extremely difficult and a reconstruction that is identical to the original is very unlikely. The amount of time and difficulty involved in removing individual stones and exactly repositioning them means this a very expensive option. The end result will be a costly operation and an inauthentic structure.
- The importance of the bridge lies not only in the structure itself, but the fact that it is a marker on the landscape that indicates the original route of one of the Cape's oldest roads into the interior of the country. The means that much of the significance of the bridge is a factor of its location. Removal of the bridge will destroy the last reminder of the old Cape Flats Road. For this reason we believe that that relocation of the bridge will constitute a severe negative impact on a significant historical landmark.

Option 2. Creation of a flood diversion scheme

This involves extending and deepening the flood bypass around the bridge by creating a channel or culvert that diverts excess floodwater round the left hand side of the bridge (facing down stream), under the road and back into the Lourens river. The work required for this will involve some fairly extensive re-modelling of some of the open space ground and cutting into the footpath on the north access to the bridge.

Positive impacts

- The work envisaged will essentially leave the bridge unaltered and in its original location. Furthermore the context of the bridge as an historical marker will remain intact.

- Depending on the way in which the flood bypass is constructed into the landscape, the visual aspect of the bridge could be enhanced.
- The information board currently positioned at the bridge could be improved with additional historical content, as well as more effective positioning.

Negative impacts

- Creating a bypass could decrease the remaining functional aspect of the bridge. This however will be mitigated by creation of a pedestrian walkway above the flood diversion.

Option 3. Construction of an extra span (modern interpretation)

The third option put forward involves adding an extra span onto the bridge using modern material and design. The extra span would go some way towards providing the bridge with the extra capacity required during periods of flooding.

Positive impacts

- The fabric of the original structure would be largely preserved.
- The addition of an extra span would allow the structure to continue to function as a foot-bridge.
- Provided that the additional span is carefully designed, a modern interpretation has the potential to complement, yet be distinct from the original bridge.

Negative impacts

- The point at which the modern span abuts the historic bridge may involve minor impact to the original fabric.
- An insensitive modern interpretation may alter the visual appeal of the historic bridge and negatively impact the ambience of the public open space.
- The functioning of the Fagan Street furrow may be affected by lowering of the water level at the “lead-off” point.

Option 4. Construction of an additional span (traditional interpretation)

The final option is to add an extra span to the bridge using a style and materials that are identical to the original fabric, thus lengthening and converting the bridge from two to three spans.

Positive impacts

- The fabric of the original bridge would largely be preserved.
- The historical ambience associated with the original structure would be preserved.

- The bridge will continue to function as a foot-bridge. The use of a traditional building style is considered to be aesthetically appealing.

Negative impacts

- A new span added in a traditional style can be considered to be a “fake” and could compromise the overall originality of the structure. A corner stone of modern conservation policy is “respect for original fabric”. This implies that any attempt to convert an original asset into something other than the original, is not favoured. Modern heritage conservation policy favours reconstruction styles that reveal the development and layering of the history of a structure over time. If a traditional style of reconstruction is favoured, it is best that the new span does not match the original structure precisely. The use of a slightly different material, fabric texture or stone would serve to distinguish the original from the modern section, thus preserving and presenting the changes that have taken place to the bridge over the course of time.
- Construction of the span will require the services of stone masons and acquisition of Table Mountain Sandstone, quarrying and dressing of which is costly.

5.1.6.3 Legal requirements

The bridge is a declared National Monument and therefore specifically protected. This does not exclude any form of alteration but means that SAHRA must be brought into negotiations with respect to the bridge’s future at the earliest possible time in the planning phase. The Regional Manager of SAHRA has suggested that all the options should be presented to the Regional Plans Committee for review and discussion, as each option does represent a possible solution to the flooding scenario. Depending on the outcome of negotiations, SAHRA will issue a permit to conduct modifications to the bridge deemed necessary and agreed on by the Regional Committee of SAHRA.

5.1.6.4 Most favoured mitigation option

The consultant archaeologist does not have the legal mandate to prohibit or approve any one of the options presented as the sole mandate rests with SAHRA. However, based on the spirit of modern conservation trends, we would favour an option that:

- Respects original fabric as far as possible
- Maintains the bridge within its physical and historical context
- Highlights the bridge through sensitive landscaping/engineering of the area
- Distinguishes original fabric from newer fabric
- Adds value to the bridge by enhancing the visitor experience.

In terms of these criteria, option 1 (translocation of the structure) is least favoured as it impacts the original fabric and removes the bridge from its physical and historical context. Options 2-4 have the potential to fulfill the criteria. Of these, option 2 is marginally favoured as this represents the least impact to the original structure. The services of a recognised conservation architect would assist the decision making process and ensure that the bridge is treated as sensitively as possible.

5.1.7 The Morgenster gates

The gates and low bridge that give access to the farm Morgenster will be impacted by alterations to the river capacity and raising the height of the existing bridge. The existing gates are of a modern automatic type but mounted within traditional gate-posts in keeping with the historic character of the precinct. It is important that any future changes made to the landscape are sympathetic to the historic entranceway to this National Monument. Since all the land that makes up Morgenster is a National Monument, the entrance gates and bridge are protected and any alterations must involve the approval of SAHRA.

5.1.7.1 Mitigation

The treatment of the entrance to Morgenster must be negotiated with the property owner and SAHRA. The services of a landscape architect or conservation architect to assist with the treatment of the area are recommended.

5.2 PHASE 2 - THE FLOOD DIVERSION CANAL

The proposed route of the flood diversion canal will follow established road alignments, portions of open land and parts of the railway reserve. Impacts to or demolition of existing standing buildings is not expected. Most of the landscape through which the canal and buried culvert will flow is highly altered as a result of road construction and levelling of sport fields. This means that any surface archaeology will have already been destroyed. Artefacts dating to the Early and Middle Stone Ages are common in the general area and these may be impacted by deep excavation.

- a) *Nature of impact.* Deep excavation of canal and culvert may impact deeply buried archaeological material.
- b) *Extent of Impact.* Local. The impact will be local in that it would affect only the direct route of the canal.
- c) *Duration of impact.* Permanent. By virtue of the fact that archaeological material can never be replicated or replaced, the impact will be permanent.
- d) *Intensity of Impact.* Low. Since the extent of the sub-surface ESA and MSA artefact accumulations is known to be very wide spread, the overall intensity of the impact is likely to be low.
- e) *Probability of occurrence.* Medium. There is a possibility that some impacts will occur, however these are likely to be minor.
- f) *Legal requirements.* All archaeological, palaeontological material, as well as structures that are over 60 years old, are protected by the Heritage Resources Act of 1999. A permit must be obtained before disturbance of any of the above are to take place.
- g) *Significance.* Low. Mitigation of impacts is possible without changing engineering options.
- h) *Status of impact.* Negative without mitigation. Less negative with mitigation.
- i) *Confidence.* Medium.

5.2.1 Mitigation

Unfortunately there is currently no reliable remote sensing method for searching for archaeological material without extensive trial excavations. It would therefore be necessary to put trial excavations through street surfaces and other properties. The cost and inconvenience is not justified as most stone artefact scatters are of moderate significance.

To mitigate against any possible impacts, it is suggested that once the diversion canal route is finalised, it should be physically checked by an archaeologist. Thereafter, periodic

inspection of the canal construction excavations (by an archaeologist) and documentation of the context of any artefactual material found, will provide adequate records.

5.3 PHASE 3 – THE FLOOD ATTENUATION DAM

The most suitable site for the flood attenuation dam has been identified at Radloff Park. The scoping document indicates that all possible effort will be made to ensure that standing buildings and parts of the cricket ground will not be impacted. This will be achieved by construction of berms in critical areas.

A site inspection revealed that impacts on historical material will be moderate, provided that there is no threat of water inundation of any of the Morgenster buildings. The Morgenster land is also a National Monument so any expropriation will need to involve SAHRA as a role player. It is possible that the lead-off section of the disused Perry *sloot* may be impacted or inundated. This section of the *sloot* is not in its original location and has been recently diverted with the establishment of the sports ground. Although the furrow system is of local significance, this is outweighed by the need to set up suitable flood alleviation measures.

- a) *Nature of impact.* Earthmoving may destroy remains of furrows and impact Morgenster land. Periodic flooding of land and old furrow may occur.
- b) *Extent of Impact.* Local.
- c) *Duration of impact.* Permanent. By virtue of the fact that archaeological material can never be replicated or replaced, the impact will be permanent.
- d) *Intensity of Impact.* Medium. Loss of the furrow is of moderate significance. Flooding and alteration of Morgenster landscape will have legal implications in terms of the Heritage Resources Act.
- e) *Probability of occurrence.* High.
- f) *Legal requirements.* All archaeological material and structures are protected by the Heritage Resources Act of 1999. Morgenster is a National Monument. A permit must be obtained before disturbance/alteration is to take place.
- g) *Significance.* Medium. Mitigation of impacts is possible without changing engineering options.
- h) *Status of impact.* Negative.
- i) *Confidence.* *Medium.*

5.3.1 Mitigation

A permit will have to be obtained from SAHRA to destroy the remains of the Perry *sloot*. The issue of periodic flooding of Morgenster land should also be negotiated with respect to Morgenster's status as a National Monument.

6. RECOMMENDED MANAGEMENT ACTIONS

6.1 PALAEOLOGICAL MATERIAL

The negative impact that could effect palaeontological material, is loss of information that will occur if the context of the find site is disturbed. To mitigate this, a palaeontologist should be consulted should it become apparent that flood alleviation measures will involve earthmoving operations at the mouth of the Lourens River. It is always best that the paleontologist is brought in well in advance of construction activities. He/she will need to sample the material to a point that significant loss of information will not result if the material is subsequently destroyed. A positive impact will be the documentation of an as yet un-described palaeontological occurrence.

A SAHRA permit will have to be obtained to destroy the palaeontological material. This will be issued if SAHRA is satisfied with the mitigation measure taken and the reporting thereof.

The scope of the work needs to be discussed with the palaeontologist. It is likely that the consultant would require one days hire of a mechanical excavator to open some profiles for examination and sampling, or this exercise could be combined with any geotechnical excavations that may be required. Most palaeontologists are specialised geologists and tend to charge geologist rates. Persons with the necessary experience may be contacted at the South African Museum, Council for Geoscience or University of Cape Town (through ACO).

Exercising of the no-go option will result in a neutral impact.

6.2 LATE STONE AGE SHELL MIDDENS

The Late Stone Age middens that have been found are all some distance from the river and may not be impacted by the construction activities. If impacts are envisaged, reduction in negativity of the impact will require the appointment of an archaeologist to sample the sites to the satisfaction of SAHRA *well before* earthmoving operations begin. This will involve excavations on each of the sites, the collection and curation of representative samples of material and radio carbon dating. Once this work has been done, a permit is required from SAHRA to destroy archaeological material.

It is expected that a week of field time will be required per archaeological site, followed by time to curate the material (according to requirements on SAHRA permits) and report preparation. Possible costs are estimated at R30 000 per site. The developer must apply to SAHRA to destroy any remaining archaeological material. SAHRA will issue the permit if they are satisfied that the archaeologist has completed the work satisfactorily.

A small positive impact will be the contribution of additional knowledge about past human settlement in the area.

Exercising of the no-go option will result in a neutral impact.

6.3 THE LOURENS RIVER AS AN HISTORIC LANDSCAPE

The river has played a key role in the development of the town of Somerset West and is therefore a historic landmark of regional significance.

Negative impacts will result in unsightly disturbance of the riverine environment during construction work.

Neutral - positive impacts can be achieved in terms of re-establishing the significance of the river in the landscape. In order to retain the sense of history we would suggest that, as far as is possible, a goal of the flood alleviation scheme would be to ensure that the riverine environment is enhanced and that the river be permitted to mature into its surrounding environment. This can be achieved through sensitive landscaping, conservation of trees and vegetation and the creation of an informative river trail.

Exercising the no-go option will result in neutral to slightly negative impacts.

6.4 THE FURROW SYSTEM

The furrows that have been identified on the river are part of an historic irrigation scheme that dates back to the 19th century when Somerset West consisted of farms and small-holdings.

Many of the furrows no longer exist, but those that still operate are a cause for concern. While changes to the river banks may impact the “lead-off” points of furrows, the greater concern is with the alteration of river water levels which will render certain furrows inoperative. Re-establishment of furrow “lead-off” points can easily be achieved through simple earthworks, however significant measures will have to be implemented to ensure that water is still available to flood the *Melck Sloot* and any other furrows for which people may still have rights. We therefore recommend that specific attention needs to be focussed on addressing this problem as well as establishing who has legal rights to abstract water from the river.

6.5 THE HISTORIC BRIDGE

The historic bridge, which is currently seen as a bottleneck in the flow of the Lourens River, is going to require intervention to solve the problem. The options that have been proposed to date are all viable and should be presented to the Regional Plans Committee of SAHRA as early as possible within the planning phase. An option that involves not relocating the bridge is favoured at present. This report would strongly support the appointment of a restoration architect or landscape architect with knowledge of conservation issues to ensure that the bridge and its setting are treated in the best possible manner.

Negative impacts primarily concern compromising the original fabric of the bridge and, if it is relocated, destroying its geographical - historical context.

Positive impacts relate to improving the way in which the bridge is “presented” in the landscape, improving the information board on the site.

6.6 MORGENSTER ENTRANCE

The bridge, and entrance to Morgenster needed to be treated in a manner that is sympathetic to historical farm precinct. The expert opinion of a conservation architect and negotiation with SAHRA and the landowner is advised.

6.7 PHASE 2 DIVERSION CANAL

Assessment of the impact of construction of the diversion canal and culvert is difficult because much of the proposed route lies under street surfaces and other modified landscapes. Physical inspection of the route will produce limited information as any impacts will be below surface and therefore invisible. While a site inspection of the final route is suggested, greatest benefit will be achieved through periodic inspection of the canal excavation.

6.8 PHASE 3 ATTENUATION DAM

Minimal impacts are expected to result from the proposed attenuation dam at Radloff Park. Clarity needs to be obtained from SAHRA with respect to the National Monument status of Morgenster land.

6.9 UNEXPECTED ARCHAEOLOGICAL REMAINS

Archaeological material, by virtue of much of it being buried, is difficult to assess before earthmoving takes place. Although we have attempted to assess the impact of the proposed project on known heritage sites, there is no guarantee that material will not come to light during construction work. Indicated below are some procedures, which, if applied, will minimise impacts that could result.

- **Archaeological finds** can take the form of buried walls, old bottles, porcelain fragments, earthenware fragments, accumulations of bone and ash dumps.
- Such material is easily recognised, and if found an archaeologist should be contacted immediately and plant diverted away from the find site until an inspection has been completed.
- Prehistoric artefacts such as stone tools are very difficult to recognise by an untrained person. For this reason an arrangement should be put into place to ensure that earthmoving operations are periodically inspected by an archaeologist.
- **Human burials** can be found anywhere on the landscape where there is enough soil to bury a body. Finds of unmarked human bone result from prehistoric burials, disused cemeteries, historic graves, or a crime scene. All human remains over 60 years of age, as well as graves of victims of conflict, are specifically protected by SAHRA. All human tissue is protected by the Human Tissue Act (Act no 65 of 1983).
- If human remains are found during construction, the bones must not be touched and mechanical excavators must be diverted.
- The find must be reported to SAHRA, the project archaeologist, the South African Police Services and the state pathologist.
- Graves that are under 60 years of age will be dealt with by SAPS, or in the cases of exhumation of cemeteries, by an undertaker.
- Graves that are over 60 years of age may only be exhumed by an archaeologist.

7. DISCUSSION AND RECOMMENDATIONS

A number of archaeological sites, furrows and a historic bridge exist on the lower reaches of the Lourens River, it is inevitable that these will have to be impacted considering the priority that must be given to the proposed flood alleviation scheme.

The furrow system is of local interest and will suffer some physical impacts at their starting points on the river. The starting points of the identified furrows can be re-instituted as they are simple earth or cement lined ditches. Greater planning is going to be needed to ensure that furrows that still function (in particular the *Melck s/oot*) will continue to be supplied with water. Balanced against the need to bring the potential flooding risks of the Lourens River to an acceptable level, and the relatively low conservation priority of the Lourens River furrows, this study does not advocate extensive measures to conserve them in their existing form. It nevertheless remains necessary to identify persons who have rights/interest in utilising water from functioning furrows, and to ensure that impacts in this regard are kept to a minimum.

The paleontological sites and the three Late Stone Age archaeological sites are not of a high enough conservation status to warrant special measures to protect them. Mitigation by specialist sampling of the material before development activities begin (to the satisfaction of SAHRA), should result in issuing of demolition permit for any remaining material.

The historic Lourens River Bridge is a declared monument and a heritage site with enough significant characteristics to warrant special efforts to ensure its conservation. For this reason it is most important that SAHRA be included in negotiations as to its future in the earliest planning stages. It is the finding of this study that adding an extra span to the bridge or creating a bypass or culvert is more desirable than moving the bridge, as its historical and geographical context will be preserved.

It is difficult to assess the impact of the proposed diversion canal (Phase 2) as any impacts that may take place will be to buried material which is difficult to detect without trial excavations. The final route of the canal and culvert should be checked and periodic inspection of any excavation work carried out. Significant impacts are not expected at the Phase 3 proposed flood attenuation dam in the Radloff Park area.

In general, the expected impacts that Phase 1 of the project will have on heritage resources is mainly of moderate significance. Acceptable options do exist for mitigation of impacts to the historic bridge. Measures to lessen the consequences of a catastrophic flood are favoured, not only for the welfare of the community but also for the preservation of a number of significant structures and historic farms in the Lourens River corridor.

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[CA = Cape Archives; DO = Deeds Office]

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7.2 Primary Sources

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CA: LND: vol..1/877, no L16248. Expropriation of land for road.

CA: D 2/1/1/46 Ref. C14/29/12. Correspondence with respect to Lourens River Bridge.

Maps, Plans & Surveys

c1700 CA: M3/340. Novaet Accurate Tabula Promonitorii Bonae Spei, vulgo Cabo de Bona Esperanca. Undated set of maps M3/332-345 are colourful series showing farmers and kraals. Paardevlei is labelled Flaminke Valey in a patch of Weylanden. See also Morrison Collection No.137.

SAL prints of similar maps include a Caarte van de Colonie van Stellenbosch Kolbe's maps?]. This shows Weylanden around an unnamed vlei. The nearest farmers are Ferdinand Appels Land on the Eerste River and Vergelegen is shown as octagon with extensive Compagnie's Bouw Landen.

[But see also James Walton, The Josephine Mill & Its Owners (1978:32), where the print is reproduced as 'Broertjen's wynbergen & bouwlandt' dated c.1689, reference M1/273. This is based on Margaret Cairns' research and so would be accurate].

c1780 CA: M1/875. Date according to Kathy Rubin. Title unknown. Vlei named Zeekoe Vally, south of T' Modder-Gat. No farmsteads below wagon road, though Paarde Vally is marked above road, with neighbours F. v.d. Heuvel, De Vos and Conterman.

1806 CA: M2/629. Military Survey of Hottentots Holland and the country about Gordon's Bay. December 1806. Lt. Smart, RE. Coloured wash in bad condition. Shows vlei, roads and homesteads, including Henrik de Vos and Crusoe [sic]. No buildings anywhere near Paardevlei. Mouth of Lourens River marked Melck Bay.

- 1808 CA: M3/404-5. Military Survey of the District of Hottentot Holland, Stellenbosch and Fraen[schoek], Cape Town, Cape of Good Hope, June 13, 1808. Colour wash map in bad condition. Shows main homesteads and roads, including Wouter de Vos and Croeser. No buildings anywhere near Paardevlei or on the eastern reaches of the river. Mouth of Lourens River marked Melck Bay.
- 1824 DO: SG diagram 113/1824 in SQ.9-52, 1831 for Farm number 797, Paarde Valley.
- 1886 CA:M3/25. Rough Plan showing Old Freehold grants at Hottentots Holland, in the Division of Stellenbosch, 31 December 1886, initialled by MB. Coloured wash plan showing outlines of grants, with Paarde Valley, Upper Paarde Vallei, Luct et Emergo, Parel Valley, Cloetenburg, etc., and layout of Somerset West village. No buildings or roads shown.
- 1890 CA:M3/2223 or M3/1752. Divisional map of Stellenbosch, F.C. Hottentots Holland. SQs shown. Shows Macasser Downs, Vaal Fon. or Moddergats Rivier Outspan, Paarde Vallei, Klein Zeekoe Vallei called Paarde Vallei, Upper Paarde Vallei, Parel Vallei and Cloetenburg. Houses shown at bottom right-hand corner of vlei and in centre of area between Lourens and Eerste rivers. Roads and railway lines shown.
- 1902 CA: M1/188. Plan of Division 27 section 553, Hottentots Holland, Stellenbosch. Shows SQ grants, no buildings. M1/3471 is another print of this plan.
- 1902 CA M4/1191 c1902-1952. Map showing Voorbrug Sloot and others. The names of a number of furrows and *sloots* (Melck, Morkel etc) refer to 18th century landowners indicating that some aspects of the furrow system date to the early colonial period.
- 1903 DO: SG diagram 3/1903 in SQ.21-29, 1903 for Consolidated Farm number 794.
- 1906 DO: T6330, 16/07/1906. This transfer deed includes various pieces of De Beers land being expropriated by railways, pipelines, roads, etc. There are many plans and documents in the file.
- 1935 CA 3/STD 4/1/22. Compilation sketch, Lourens River area, Stellenbosch Division C1935.

APPENDIX A

1. INTRODUCTION

The method used to present this selection of events and array of people associated with the Lourens River and surrounds is in the form of notes and direct quotes in chronological sequence, rather than in narrative form. Sometimes this has led to the same event being described more than once, but by different authors who added some new detail. The sources were both primary (transfers of property, contemporary maps and plans, letters and reports) and secondary (published and unpublished books and pamphlets). The secondary works concerned with the history of the area were well researched but not fully referenced, so we have not always traced the original sources.

2. CHRONOLOGY OF EVENTS

1655 It was on 7 September 1655 when Corporal Muller departed from the settlement at Table Bay with orders to explore the territory to the east of the Cape Peninsula. It took him 13 days to cross the Cape Flats and reach the mountains on the opposite side of False Bay, some 50 km away. It is to this cautious hero that we owe the discovery of the Eerste River, by whose banks he camped on 13 September 1655 (Burman 1970:11).

Corporal Muller, crossed the Lourens River on his approach to the mountains, but it made very little impression on him - he was too anxious to get home (Burman 1970:26).

Then in September 1655 Corporal W. Muller led a larger expedition to the Hottentot's Holland area. They had the luxury of some pack oxen. They camped on the Lourens river where they found abandoned Khoekhoe kraals. They climbed the mountain and are said to have seen as far as Kogelbaai (Nellmapius 1995:3).

1657 The first real description we have of [the Lourens River] is that provided in June 1657 by three truants - free burgers farming on the Liesbeeck, who had journeyed inland without even asking Van Riebeeck's permission. They told of a very beautiful river, on both sides of which bitter almond trees grew in abundance. So fertile was the valley that the soil at the Cape did not compare with it. The two adventurers found two Khoekhoe encampments there; the Khoekhoe said that they called this rich land their 'Holland or fatherland' (Burman 1970:26).

This river, as early as 1699, was known as the Tweede River, since it is the next one beyond the Eerste River (Burman 1970:26).

In June 1657 a party of three Freeburgers travelled to Hottentot's Holland to barter cattle. They encountered two Khoekhoe kraals numbering 500 to 600 people. We believe that from this stems the name Hottentot's Holland, implying the home of the Hottentots (Nellmapius 1995:3-4).

1660 When the Dutch first saw Hottentots-Holland it had no permanent inhabitants, for the indigenous people (Kaaapmans) were nomadic. In October 1660 the Khoekhoe chief Sousoa, from across the mountains, arrived and settled at Hottentots-Holland with his tribe; which, as Van Riebeeck gleefully comments, was a sad blow for the local Kaaapmans, who were now showing open enmity towards the Dutch (Burman 1970:27).

- 1662** Zacharias Waagenaar succeeded van Riebeeck in 1662, and he encouraged barter expeditions. Thus he sent out Hendrik Lacus, a company surveyor, eastwards. Lacus almost certainly crossed the Hottentot's Holland range by the Gantouw (Eland's path) which later became known as the Hottentot's Holland kloof. The Khoekhoe had been using this route to move their cattle and sheep across the mountain range. He did another very successful barter expedition to Hottentot's Holland, this time with a wagon loaded with merchandise (Nellmapius 1995:5-6).
- 1671** It was not long before the Company began casting covetous eyes at the rich pastures of the Tweede River. The first cautious step towards occupying it was taken in 1671 when soldiers arrived at Hottentots-Holland, on the pretext of guarding against attack by hostile Hottentots (Burman 1970:27).
- 1672** Then, on 3 May 1672, the Company bought Hottentots-Holland from Sousoa for trade goods to a book value of R1600. In October Pieter Cruythoff and 15 men arrived with instructions to begin planting corn (Burman 1970:27). In May 1672 the Council of Policy at the Cape obtained about 2 500 morgen of land from the Khoekhoe 'minor Prince D'Houw' in exchange for some money and a few trinkets. A few months later a cattle post was established for grazing the Company's herds and bartering animals with neighbouring Hottentots (Brooke Simons 1987:64). Starting with a Company cattlepost and grain farm in 1672 the Hottentot's Holland area was further settled in Simon van der Stel's time, and by the time that Willem Adriaan van der Stel took over as Governor in 1699, wagon traffic was well established on the informal road over the Cape Flats (Nellmapius 1995:13).
- 1673** By May 1673 10 morgen of land was under cultivation. This may have been a contributory factor to the outbreak of the Second Hottentot War, for the Hottentots were becoming afraid that the Dutch intended stealing their country. The very next month Gonnema and his men surrounded a hunting party of 8 burghers and killed them, thus touching off the war (Burman 1970:27).
- 1678** The post at Hottentots-Holland did not thrive, despite the fertile soil, and proved a grave disappointment to the Company. In January 1678 Governor Bax released it to private enterprise; the post was leased for 3 years to Jochum Marquart and Hendrik Alberts, on the understanding that they looked after the Company's cattle, and delivered a stipulated amount of corn and other produce each year (Burman 1970:27).
- 1685** Simon van der Stel decided against making this the site of a settlement When van Rheeede ... visited Hottentots-Holland in 1685 he was scathing in his condemnation of the post, and ordered van der Stel to rebuild it nearer the mountains (Burman 1970:27).
- 1695** In 1695 the directors gave instructions that Company farming operations should be discontinued as soon as possible. The days of the Hottentots-Holland station were thus numbered, but Simon van der Stel, now in the last years of his rule, took no active steps to enforce this order (Burman 1970:27).
- 1690s** Among the early fishermen of False Bay were probably the Malays. They had the necessary experience and background, and there could have been little other occupation for sheikh Yussuf's retainers, settled as they were in the 1690s at the mouth of the Eerste River (Burman 1970:32).

- 1700** Simon van der Stel retired in 1699 and his son succeeded him as Governor. Willem Adriaan already had his eye on the Tweede River valley, and his chance came in February 1700, with the arrival of a Company Commissioner, Wouter Valckenier (Burman 1970:27-28).

Willem Adriaan van der Stel developed his sumptuous country estate at Vergelegen in 1700, and his brother Frans had a huge farm under the Helderberg (Nellmapius 1995:13). Vergelegen was equipped with a large Slave lodge, wine cellar, water mill and blacksmith. Archaeological remains of some of these structures have survived until the present day.

Frans van der Stel, born in Amsterdam c.1668, died in Amsterdam 1718. Fourth child of Simon and Johanna Jacoba Six. Frans was passionately fond of hunting ... [It was] also evident that he was the son who accompanied Simon van der Stel on his journey to the Copper Mountains. Of all Simon van der Stel's sons he was the one who knew the Cape the best and loved it most.

On 11.3.1699 Commissioner Daniel Heems gave him the farm Parel Valley, 140 morgen in extent ... [He] obtained another 64 morgen in 1704 and a further 40 morgen in 1707 ...

The freeburghers jeeringly called him 'Jonker Frans', whereas the French referred to him as 'Don Francisco', and from the petition of 1705 it is evident that he was one of the most hated burghers in the country.

Van der Stel had married Johanna Wessels ... [and they had] three daughters in 1704, 1706 and 1708 ... [At] the time of van der Stel's departure the youngest stayed behind with her mother ... It was only after her husband's death in 1718 that [Johanna] went to live in the Netherlands (A.J.Boeseken in de Kock & Kruger 1972:779-780).

A colourful series of contemporary maps exist showing farms and khoi kraals. Paardevlei is labelled Flaminkke Valey in a patch of Weylanden. A similar map, The Caarte van de Colonie van Stellenbosch, shows Weylanden around an unnamed vlei. The nearest farms are Ferdinand Appels Land on the Eerste River and W.A. van der Stel's Vergelegen is shown as an octagon with extensive Compagnie's Bouw Landen.

- 1701** Francois van der Stel granted Paarde Valley, a farm of about 40 morgen.

Possibly due to the configuration of the bay, coupled with the presence of the two rivers, fishing between the Eerste and Tweede Rivier was always excellent; so good in fact that Willem Adriaan van der Stel set up a fishing station at the Lourens River mouth and his brother Frans owned the rest of the fishing as far as the Eerste River (Burman 1970:32).

- 1708** Willem Adriaan van der Stel was banished from the Cape on charges of corruption. His home at Vergelegen was ordered to be demolished and his farm was divided into 4 portions, making up the 4 major farms that existed on the upper reaches of the Lourens River. His brother Frans van der Stel was also banished on account of his greed and excesses. He left behind, among other properties, the farm Groot Paardevlei, which made virtually the entire eastern reach of the Lourens River.

- 1715** By this time the Tweede river had changed its name. The map of 1696 shows it as the Tweede River, but the Wildschutte Boek of 1715 calls it Lourens River. Kolbe, the German naturalist who lived at the Cape in 1715 explains this change by saying

that a man named Lourens had fallen into the river and drowned - presumably in the winter, since this would be no mean feat in the summer. In course of time, says Kolbe, the name changed from Laurens to Lourens (Burman 1970:29).

Following Frans van der Stel's banishment, Paardevlei was transferred to C. van der Westhuyzen in 1717 together with Parelvallei, then adjoining. In the same year Nicolaas van der Heuwel, who was married to van der Westhuyzen's niece, acquired the two farms. In 1735 they passed into the hands of Olof de Wet who had married Heuwel's widow. By 1748 Paardevlei - now a separate entity - was transferred to Jacob van Rhenen who owned it until 1751 when it became the property of the Heemraad, Michiel Romond, from whom it was purchased by Martin Melck a few years later (Heap 1977:73).

Martin Melck was born in 1723, son of a boatman in Memel. He came to the Cape in 1746. Melck became one of the greatest wine-farmers of the Colony ... [and] one of the foremost cattle-farmers and also went in for lime-burning and brick-making. He was Heemraad of Stellenbosch from 1766-67 and 1769-70 (Hoge 1946:266-267).

The centre of Melck's activities was Elsenburg ... After the death of his first wife he married (1788) Rosina Loubser, widow of Hercules Adriaan Malan and daughter of Pieter Loubser and his wife Johanna Eksteen (Kruger & Beyers 1977:596-597).

In 1774 Melck owned several farms in the Colony including two in the Hottentots Holland, Paardevlei and Laatste Gift. At this time he was living at Elsenburg and on his other farms he 'had placed stewards who managed them on his behalf'.

The Melck Sloot which carries water from the Lourens River to the much-enlarged Paardevlei of today, is so named because it follows the course of an old furrow dug by Melck in an early attempt to increase the size of the vlei (Heap 1977:73).

Martin Melck made a request for government protection of fish stock in Paardevlei: Melck (Marten); burgher; submits that he had lately bought from the Heemraad, Michiel Romond, a farm in Hottentots Holland, named the "Paarde Vleij" itself, after which the farm is called - and which was almost dried up and partly situated on his ground - thoroughly cleaned and deepened, and provided once more with water; and, for his own pleasure, stocked it with some fish for breeding purposes; that this had also been attempted by his predecessors, but that, to their annoyance and sorrow, they had found that some vile people had at once set to work to catch the fish without giving them time to grow or breed, thus destroying the nursery; and that, as memorialist, in consequence, fears, with reason, that the same thing may occur to him also, he prays the Council to forbid fish catching in "Paarde Vleij" to everyone, excepting himself and future owners of the place; and further, that he may obtain an open letter on the subject. [N.B. Council grants his request; see Resolution, 2nd September, 1760.]. (No.155 1760). (Leibbrandt :761)

1795 First British Occupation of the Cape.

Lady Anne Barnard, wife of the Secretary to British Governor Macartney, wrote in November 1797: the 2d house in Hottentot Holland was purchased lately by a Mr Thibaud [sic] a french man, one of Morons¹ people I believe he is supposed to have a hankering after the doctrines of that nation, it is situated near a lake, and that lake is within a mile of Modergat Bay, I mention it particularly as the lake is famous for a

¹ Kibourg came to the Cape with the Regiment de Meuron, raised for the Dutch E.I. Co. by the Swiss Comte Charles de Meuron in 1781. It landed at the Cape in Jan. 1783 and remained until 1788. The Regiment transferred its allegiance to the British in 1795 in Ceylon (Theal, History v.3 p.207,238).

fish called the Springer², the very best fish I ever tasted in all my life, any where, the most delicate and the fattest, we are in negotiation to procure its breed, and its spawn, I should be delighted were the great events of his Majesty's reign to have added to the list of occurrences the acquisition of "that charming fish the Springer introduced into this county by the wife of secretary Barnard" - it weighs about 3 or 4 pounds but fancy cannot paint how good it is, it is the Fish only that could convince you. (Letter 14, in Lewin Robinson 1973:83-84).

- 1806** Military Survey of Hottentots Holland and the country about Gordon's Bay. Completed in December 1806. by Lt. Smart, RE. Coloured wash in bad condition. Shows vlei, roads and homesteads, including Hendrik de Vos and Crusoe [sic]. No buildings anywhere near Paardevlei. Mouth of Lourens River marked Melck Bay.

One of the most dramatic moments for the Lourens River farmers came in 1806 when, after the battle of Blaauwberg, Janssens retreated to Hottentots-Holland Kloof. The British occupied the valley, and for a while it looked as though the Lourens River would be a witness to fierce fighting. The spirit of compromise won the day, and Janssens surrendered to the British at Hottentots-Holland (Burman 1970:30).

- 1808** Military Survey of the District of Hottentot Holland, Stellenbosch and Fraen[schoek], Cape Town, Cape of Good Hope, June 13, 1808. Colour wash map in bad condition. Shows main homesteads and roads, including Wouter de Vos and Croeser. No buildings anywhere near Paardevlei. Note the farm roads leading down to Melck Bay fishing beach.

- 1813** In 1813 a new land ownership system based on quitrent tenure was introduced by Governor Cradock. The period 1815 to 1834 saw extending administrative control over the colony and establishment of small towns.

By now there was quite a little settlement along the Lourens River and in 1813 the Community of Hottentots-Holland bought ground at Cloetenburg on which to erect a church. The farm Cloetenburg was once a portion of Vergegen.

- 1818** Building of the Dutch Reformed Church. The church was dedicated in 1821, and in 1822 the village of Somerset West came into being (Burman 1970:31).

- 1822** The street system of the village was formally laid out. The town was named *Somerset* after Lord Charles Somerset. It was only after the naming of the town of Somerset East in the Eastern Cape, that *Somerset* was referred to as Somerset West.

- 1825** Cloetenburg passes from G. van Sittert to the Dutch Reformed Church in Somerset West. Next transfer in 1860.

- 1830** Sir Lowry Cole was governor of the Cape from 1828 to 1833. Also arriving at the Cape in 1828 was Charles Mitchell, appointed Surveyor General, Civil Engineer and Superintendent of Works (Nellmapius 1995:19).
The building of Sir Lowry's Pass in 1830 caused a lot of traffic to pass through Somerset West, and the provision of a good road to Cape Town became essential.

² Mullet or Harder (family *Mugilidae*). NB this is a tidal estuary fish, though, and so Lewin Robinson thinks the lake was probably a lagoon in the Gordon's Bay neighbourhood.

This was brought about in 1843 by John Montagu, who capped the job by having a solid bridge built over the Lourens River in 1845. This bridge, which is an Historical Monument, continued to carry the main traffic until 1938 when a new and larger bridge was constructed alongside it (Burman 1970:31).

- 1831** The Houw Hoek pass was completed in April 1831 (Nellmapius 1995:20).
- 1862** A railway line to Wellington via Eerste River was opened in 1862. This brought a railhead to within approximately 12 miles of Somerset West and Mosterd's Bay (Strand). Passengers, mail and goods had to be conveyed by wagon and cart from those two places to Eerste River station and vice versa. The route from the Strand traversed the beach at low tide, the sand-dunes where the African Explosives and Chemical Industries factory buildings now stand, and a portion of the farm Zandvleit. It was a lengthy and hazardous journey. The cart often stuck in the sand and passengers had to help pull it out. It was not until 1889 that the line was extended from Eerste River to Somerset West via Faure siding (now Faure station) and Helderberg siding (now Firgrove). The extension of the line from Somerset West to Sir Lowry's Pass took place in 1890 (Heap 1977:101).
- 1886** 'Rough Plan showing Old Freehold grants at Hottentots Holland, in the Division of Stellenbosch, 31 December 1886. MB.' Coloured wash plan showing outlines of grants, with Paarde Valley, Upper Paarde Vallei, Luct et Emergo, Parel Valley, Cloetenburg, etc., and layout of Somerset West village. No buildings or roads shown.
- 1890** Divisional map of Stellenbosch, F.C. Hottentots Holland. SQs shown. Shows Macasser Downs, Vaal Fon. or Moddergats Rivier Outspan, Paarde Vallei, Klein Zeekoe Vallei called Paarde Vallei, Upper Paarde Vallei, Parel Vallei and Cloetenburg. Roads and railway lines shown.
- 1898** Van Breda sells portion 1 of Farm 803 to Benjamin Gordon. Gordon sells it in 1899 to De Beers.
- 1900** Early in 1900 the Stellenbosch Divisional Council granted the De Beers Consolidated Mines Ltd. a provisional licence for the erection of an explosives factory on a large tract of land near the coast between the mouths of the Eerste and Lourens Rivers. (A great portion of this had been part of the farms Groot Paardevlei, Klein Paardevlei, and Pastorie Farm) (Heap 1977:118).
- 1901** Work on the factory, under the direction of Colonel William R. Quinan, of the Pinole Works, California, began slowly. One of the first things to be completed was a branch railway line between Helderberg Siding and the factory site. Then came store-houses, quarters for workmen, a native compound, a foundry, a brickmaking plant and two nitro-glycerine systems. The administration buildings, a manager's house and the Paardevlei Club were completed in 1901 (Heap 1977:118).
The main buildings at Somerset West, including the office block, designed by Herbert Baker, and the Paarde Vlei Club, had been completed in 1901 (Cartwright 1964:102). Another aspect of Somerset West architecture is Herbert Baker's design for the strictly utilitarian dynamite factory and its environs. With the latter he succeeded in making a habitable township for those employed by the factory; little homes far

removed in style from the starkness of the factory buildings (Picton-Seymour 1977:141).

- 1903** Survey diagram of the properties owned by De Beers Consolidated Mines Limited, amalgamated into Farm 794. Buildings, railway line and roads are shown.

In July 1903, De Beers Explosives Works was granted its final licence, and the following month the first truck of 400 cases of dynamite was dispatched from the factory to De Beers Consolidated Mines Ltd in Kimberley.

Water was the key to the factory's location, and the main water supply was taken from the Lourens River. But De Beers were aware of the dry summers of the Lourens River. So Paarde Vlei, the shallow body of water which had always formed a distinctive feature of the neighbourhood, was drained and cleaned. An enormous volume of mud was removed, and an earthen embankment added. Then it was filled from the Lourens River, and became a reservoir, holding 134 000 000 gallons (609 MI) of water. This is topped up during the rainy season from the Lourens River via the Melck Sloot.

- 1939** Plans were passed by the municipality for the re-routing of a number of furrows and the addition of concrete linings to others, particularly in the town of Somerset West.

- 1900-2000** Somerset West subject to increasing urbanisation and sub-division of land. Many Victorian, Georgian, and DEIC period buildings in and around village demolished with the result that very few remain. The central village area - Main Road, Reitz and Victoria Streets still contains some old structures.