DEPARTMENT OF WATER AFFAIRS

NO. 1069 **16 AUGUST 2019**

INVITATION TO SUBMIT WRITTEN COMMENTS IN TERMS OF SECTION 110 OF THE NATIONAL WATER ACT 1998 (ACT 36 OF 1998) ON THE PROPOSED FOXWOOD DAM AND THE ENVIRONMENTAL IMPACT ASSESSMENT RELATING THERETO

The Minister of Water and Sanitation intends constructing a government waterworks as contained in the Schedule hereto.

In terms of Section 110(1)(b)(iii) of the National Water Act, 1998 (Act 36 of 1998), interested parties are invited to submit written comments on the proposed government waterworks and the environmental impact assessment by 31 October 2019. Comments must be submitted to the Director-General, Department of Water and Sanitation, Private Bag X313, Pretoria; Fax: 012 336 6863 and marked for the attention of Mr Menard Mugumo, Chief Engineer: Options Analysis.

SCHEDULE TO THE PROPOSED FOXWOOD DAM GOVERNMENT WATERWORKS AND SUMMARY OF THE ENVIRONMENTAL IMPACT ASSESSMENT

A. FOXWOOD DAM AND APPURTENANT WORKS

1) INTRODUCTION

The Department of Water and Sanitation recently undertook detailed planning investigations to establish the feasibility of building the Foxwood Dam and appurtenant structures, near the town of Adelaide in the Eastern Cape Province. The proposed Foxwood Dam will regulate the variable runoff in the Koonap River to make water available for irrigation development. The availability of water, together with the mobilisation of land and human resources, can provide a stimulus for socio-economic development in this region of South Africa.

The proposed storage dam at the Foxwood site will also provide high assurance water to the town of Adelaide, to meet future requirements for domestic, municipal and industrial use in the area.

A locality map of the proposed scheme is attached.

2) FOXWOOD DAM AND APPURTENANT WORKS

The proposed Foxwood dam site is situated in the Koonap River, just outside the town of Adelaide, at coordinates 32° 40' 30" South and 26° 16' 0" East. The dam has been designed to store a total of 55 million cubic metres of water and yield approximately 16 million cubic metres at a 95% level of assurance. The storage capacity is equal to the mean annual runoff from the catchment (1.0 MAR).

A yield of approximately 12.5 million cubic metres per annum will be available for agricultural development after making provision for downstream use (ecological reserve and existing use). This yield is sufficient for an irrigation scheme of 1 250

hectares of high value tree crops (peaches, lemons and macadamias). The area of the irrigation scheme is based on a water consumption of 10 000 cubic metres per hectare per annum with a 20% allowance for losses from the dam wall to the field edge.

The proposed dam can also supply the annual domestic water requirement of 0.78 million cubic metres for the town of Adelaide. This future water requirement has been conservatively forecast at a 0% growth rate as Adelaide, with a population of 25 00 people, currently has a negative growth rate.

The results of the geotechnical investigation indicate that it is possible to construct a composite earthfill and concrete gravity dam at the Foxwood dam site. The recommended dam wall comprises an earthfill embankment on the right flank and a concrete gravity spillway, which discharges onto a concrete apron and stilling basin in the river section. The overall length of the dam wall and spillway will be 485 metres with a maximum height above foundation level of 49 metres.

A multilevel intake tower will be incorporated into the concrete spillway section to enable water to be abstracted at different levels to maintain adequate quality. The outlet works have been designed to make provision for discharge of the anticipated maximum environmental water requirements (6 m^3/s) and all downstream use. The valve chamber is situated in the toe of the left abutment and provision has been made for a future pump station.

Sufficient material suitable for the construction of an embankment, with a wide variability in quality, has been identified within borrow pits and under the dam footprint. A hard rock source for sand drainage filters, concrete aggregate, riprap and fine aggregate is available at a potential quarry site 5 km north of the dam site. Grouting of the dam foundations and abutment of the concrete gravity section will be required to prevent seepage.

Technical details of the proposed Foxwood Dam are summarised in the table below:

Description	Detail*	Unit
Dam type	Composite Earthfill Embankment with Concrete Gravity Spillway	-
Gross full supply capacity	55	million m^3
Yield (95% assurance)	16	million m^3/a
Surface area at full supply level	460	Hectares
Full supply level (FSL)	615	m.a.s.l
Non-overflow crest	620.5	m.a.s.l
Lowest foundation level	571.5	m.a.s.l
Dam wall length	485	m
Dam height at non-overflow crest level	49	m
Spillway type	Ogee concrete gravity structure	-
Spillway capacity	5 218	m^3/s

Description	Detail*	Unit
Spillway length	250	m

* *The above detail is based on the preliminary design of Foxwood Dam and is subject to final design which may result in changes to the FSL and the overall length of the dam wall.*

A gauging weir will be required immediately downstream of the dam to measure releases from the dam and monitor floods spilling over the dam. Provision has been made in the estimated cost of the project for this gauging weir.

3) LAND MATTERS AND EXISTING INFRASTRUCTURE

Existing water supply canal
The proposed Foxwood Dam basin will inundate a portion of the existing gravity canal that supplies Adelaide Dam. The affected portion will be relocated in a new pipeline to maintain the gravity supply system.

Relocation of R344 and MR00639
The Foxwood Dam basin will inundate a portion of Route R344, which links Adelaide and Tarkastad. A portion of Route MR00639 will also be inundated. This route provides a bypass of Adelaide by linking the road between Adelaide and Bedford to Route R344.

Consultation regarding the potential relocation of the roads has taken place with the Eastern Cape Department of Roads and Public Works (ECDRPW). Provision has been made for the relocation of Route R344 to the same standard as the existing gravel road and will include a 91 m long bridge to span the tail water of the dam. ECDRPW indicated that the relocation of Route MR00639, which will be very expensive due to the steep terrain, may not be required due to low usage. The closure of this portion of road is however subject to a detailed traffic impact study during implementation of the project.

Access to the dam
Access to the left bank is from Route R344 approximately 4 km outside of Adelaide. Access to the right bank and embankment crest should be provided via Route MR00639 through a cutting on the right bank. The proposed access routes should be reviewed in the detailed design stage.

Land Inundation
A preliminary dam boundary line, depicting the minimum land requirements for the dam basin and dam wall of the proposed Foxwood Dam, was calculated to determine the extent and cost of land acquisition. This preliminary land acquisition area is based on the backwater line for a 1:100 year flood passing through the dam, plus a buffer zone of 15 metre horizontal distance in flat areas or 1.5 metre vertical distance in steep areas of the dam basin.

Properties affected by the proposed Foxwood Dam are mostly in private ownership and generally used for commercial farming. The estimated cost of land acquisition is based on a detailed inventory of the affected properties, land uses on those properties and physical improvements.

There are a number of structures within the dam basin that will be inundated and will be removed subject to the findings of the heritage impact assessment. These structures include two bridges on the existing R344, a disused weir immediately upstream of the proposed dam wall site, portions of MR00639 and R344 roads,

portions of Eskom and Telkom infrastructure, a portion of the canal to Adelaide Dam, and farming infrastructure, such as storage tanks and pipelines.

A grave site was identified in the upper reaches of the proposed reservoir, which will require assessment and relocation as part of the implementation of this project.

4) FUNDING REQUIREMENTS

The cost of building the proposed Foxwood Dam and associated works has been estimated at R2 511 million at June 2014 prices, including contingencies (15%), professional fees for design and construction supervision (15%), and VAT (14%). A breakdown of the cost is as follows:

Foxwood Dam and associated infrastructure	R2 084 million
Estimated peak funding for establishment of a 1 250 hectare irrigation scheme	R 427 million
TOTAL CAPITAL COST	**R2 511 million**

The economic activity of the proposed project results from the construction of the dam, over a four-year period, and then its operation and sale of water. A six-year period has been estimated until the full take-up of water from the dam is achieved, primarily from the development of the irrigation scheme.

A common measure for assessing economic efficiency of developing new water resources in South Africa is the unit reference value (URV), which is an expression of the unit cost of water. The URV for water yielded by the proposed Foxwood Dam has been calculated as R11.77 per cubic metre at a discount rate of 8% per annum. This URV indicates that the capital cost of the dam is too high to be recovered from the sale of water for irrigation and the capital cost needs to be grant funded.

It is therefore recommended that the capital cost of the proposed Foxwood Dam project be funded by National Treasury as enabling infrastructure to support the development of the proposed irrigation scheme and to stimulate economic activity and job creation. The URV calculated over the life of the dam, excluding the capital cost, but using the annual maintenance and operation costs, results in a value of R0.60 per cubic metre. The funding required for establishing the irrigation scheme may be repaid over time when the scheme becomes financially profitable.

During the implementation of the project, the price of water must be determined in accordance with the National Water Pricing Strategy and allow for a full review of water allocation within the Koonap River catchment.

5) SOCIO-ECONOMIC BENEFITS

The economic impact of construction and operation of the proposed Foxwood Dam was evaluated over a ten year period (four years of construction and six years of operation). The impact of operation and construction on the Gross Domestic Product (GDP) over this period is estimated at R2 305 million. The peak employment during this period is estimated at 1 160 direct employment opportunities during the third year of construction. Sustainable employment opportunities within the Raymond Mhlaba (previously Nxuba) Local Municipality area are expected to increase to 15 per annum required for operating the dam and associated infrastructure.

The main sustainable economic impact of the proposed Foxwood Dam project will be provided by the irrigation scheme. The financial output from the development of

1 250 hectares of irrigation was evaluated, using averaged data from all crop types and individual farm sizes of 20 hectares. The annual impact on the GDP, when the scheme is fully operational, is estimated at R503 million. The potential export earnings from the fully developed scheme, if half of the produce is exported, is estimated at R150 million per annum.

Agriculture is responsible for 37% of employment in the Raymond Mhlaba Local Municipality area, but there has been a 16.5% reduction in employment in agriculture from 2001 to 2011. The development of the proposed 1 250 hectare irrigation scheme can reverse this negative trend and create new employment. The scheme has the potential to create a total of 1 930 direct employment opportunities, and a further 725 indirect and induced employment opportunities during operation phase. The annual wages earned by farm workers, when the scheme is fully developed, is estimated at R41.8 million.

6) OPERATIONAL REQUIREMENTS

The most important operational requirement for the proposed irrigation scheme is to acquire the use of the land identified for irrigation development. This land along the Koonap River, downstream of the proposed Foxwood Dam site, needs to be combined from separate farms that are currently owned by private individuals who are themselves successful farmers. The land (13 000 hectares) would have to be acquired by the State or the current land owners could become partners in the envisaged development. A long term sustainable and mutually acceptable contractual arrangement needs to be agreed between the State, the landowners and local communities in order for the proposed irrigation scheme to operate successfully.

7) IMPLEMENTATION ARRANGEMENTS

An appropriately mandated and resourced Implementing Agent is required to provide leadership and management for the successful development of the irrigation scheme. It will be important for that Implementing Agent to fully focus on the socio-economic development of the area and to be available to commit resources to the project for a long period. The emerging farmers will be reliant on the Implementing Agent to provide training and technical support, as well as structured financing and marketing services for a period of at least 10 years.

After consultation it has been concluded that the Eastern Cape Rural Development Agency (ECRDA) is well placed to fulfil the role of Implementing Agent for the irrigation scheme. The availability of the Agency to undertake this responsibility has not been confirmed. The viability of the irrigation scheme will be dependent on the commitment by government of the necessary financial and other resources for a period of 10 years or until the project is self-sustaining.

Consultation with the national Department of Agriculture, Forestry and Fisheries as well as the provincial Department of Rural Development and Agrarian Reform (DRDAR) has taken place throughout this feasibility study. However it is imperative that a thorough and in-depth feasibility study is carried out for the proposed irrigation scheme as part of the implementation phase. The proposed feasibility study, to be undertaken by DRDAR, should address the institutional arrangements related to establishment and operation of the scheme.

B. SUMMARY OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The Department of Water and Sanitation recently completed an Environmental Impact Assessment (EIA) in terms of Section 110 of the National Water Act, 1998 (Act No. 36

of 1998) and in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). Authorisation was granted for the proposed Foxwood Dam project by the Department of Environmental Affairs on 28 April 2016 in terms of the Environmental Impact Assessment Regulations, 2014.

One appeal was lodged within the prescribed period, which dealt with the movement of livestock that will be affected by the inundation of road MR00639. The investigation of this appeal resulted in an application for amendment of the Authorisation to include an additional condition that was agreed with the appellant (Amendment 12). An amended authorisation was issued by the Department of Environmental Affairs on 17 November 2016.

The environmental authorisation stipulates commencement of construction within a period of five (5) years from the date of authorisation. This means that the authorisation will lapse if the activity does not commence by 16 November 2021, or as subsequently revised.

Conditions of environmental authorisation must be observed both during construction and operation. To this end, an independent Environmental Control Officer, reporting to the Department of Environmental Affairs, must be appointed to monitor compliance with conditions of authorisation during construction.

The findings of the eight specialist studies conducted during the EIA are summarised in the following sections.

1) TERRESTRIAL ECOLOGICAL IMPACT ASSESSMENT

The impact on vegetation in the study area is mostly due to cultivation (historical and current) and livestock. The riparian habitat of the Koonap River is relatively intact and the same applies to the Mankazana River. One threatened plant species was observed on site, namely Haemanthus deformis and only three species of conservation importance were noted. It is recommended that during implementation a botanist be appointed to perform a final walk-through of the proposed Foxwood dam site to identify more sensitive plant species, and assist in identifying areas that require protection.

There is low mammalian species diversity, which may be due to degradation of habitat in the study area due to anthropogenic impacts such as grazing. Rivers represent important habitat for many species, including three stork species, ducks, geese and a variety of other water birds. The reptile assessments indicate that the remaining patches of grasslands, bushveld, rocky areas and riparian vegetation are of high importance to reptiles. There were no reptile species recorded that are of conservation importance.

During the construction phase a concerted effort shall be made to prevent the loss of red data, protected and endangered fauna and flora species that will be affected by the project, through a search, rescue and relocation plan. The proposed Foxwood Dam and its associated infrastructure do not fall in any of the threatened ecosystems, protected areas, Critical Biodiversity Areas 1, ecological corridors and habitat containing threatened species, or areas identified as containing irreplaceable biodiversity by a national or provincial management authority for protected areas. No unique features and special habitats were recorded on site. The distribution ranges of those species found are also not considered to be endemic to the project area and therefore biodiversity offsets are not required.

2) AQUATIC IMPACT ASSESSMENT

The overall ecological status of the watercourses surveyed in the proposed project area is a C-category, which translates to a system considered to be moderately modified. Water quality and in-stream habitat conditions were considered good. Taxa known to be intolerant of degraded habitat and water quality conditions were noted to be present in relatively high abundance. The ecological importance and sensitivity of the system remains within a High category.

The wetland areas within the proposed project area are all considered to be artificial impoundments (off channel farm storage dams) and wetland habitat that has been induced through seepage from unlined irrigation canals. A full wetland survey, detailing the overall ecological integrity, was therefore not warranted.

3) AGRICULTURAL IMPACT ASSESSMENT

Six farms will be affected by the proposed Foxwood Dam basin, with a total of 455 hectares that will be inundated and lost for farming. In addition the farmers will also lose irrigation infrastructure, such as pumps and pipelines. The agricultural land under permanent irrigation is considered as high potential.

The proposed Foxwood Dam will have a positive impact on irrigation downstream of the dam, but the development will impact the six landowners in the basin negatively, to varying degrees. The area is arid with high summer temperatures where the farmers depend on irrigation and deep fertile alluvial soils for their livelihood. The development of the dam will influence their income to the degree that the small farms will no longer be viable. While some mitigation is possible, acquiring the properties affected by the dam basin and consolidating the unaffected portions with adjoining properties may be the only option.

4) HERITAGE IMPACT ASSESSMENT

The area is not part of any known cultural landscape. A survey of aerial photographs, covering the footprint of the proposed Foxwood Dam, located various historical features or structures that need additional investigation by means of a systematic ground survey during implementation of this project. These structures include two bridges over the Koonap River, a bridge over the Mankazana River, a weir built in 1901, an old pump house adjacent to the weir, and three farmsteads with outbuildings. The three farmsteads are older than 60 years and one also has graves on the site. The three bridges may also be older than 60 years and need to be assessed by a heritage specialist.

During implementation of the proposed Foxwood Dam a second phase heritage impact assessment needs to be carried out. This assessment should include a paleontological impact assessment by an accredited palaeontologist and an archaeological impact assessment by an accredited archaeologist.

No development may proceed on the project footprint before these second phase studies are completed. The South African Heritage Resources Act, 1999 (Act No. 25 of 1999) states that operations exposing archaeological, historical or paleontological remains must cease immediately and the site must be evaluated by the provincial heritage agency.

5) *VISUAL IMPACT ASSESSMENT*

The two landscape types that occur in the project area of the proposed Foxwood Dam are Adelaide Agricultural and Adelaide Thicket Vegetation. Both landscape types have very similar topographical characteristics, but are distinguished due to the difference in land use.

The residents of the surrounding farms will be affected by the construction of the proposed Foxwood Dam and infrastructure due to their proximity to the site. Visual intrusion will increase as the project nears completion. Residents further than two kilometres radius may only be exposed to fragmented views of the construction phase and completed development, due to the topography that screens most of the site. The severity of visual impact for both stages of the development will be moderate.

Recreational users and tourists travelling on the local district roads will experience views of the site and the construction activity. The severity of visual impact will be low as the duration of views of the construction activities will be short.

6) *SOCIAL IMPACT ASSESSMENT*

The study area has a small population of 24 245 with only 8% of the population over age 20 having completed high school. Over 80% of the households earn in the low income bracket. The Raymond Mhlaba Local Municipality has a high level of access to basic services.

The project will result in a loss of arable land and income from agriculture as the dam is mostly located on privately-owned farms. The dam however also presents the opportunity to generate income. It is estimated that the irrigation opportunities downstream could generate approximately 1 930 direct sustainable jobs and stimulate up to R 503 million of Gross Domestic Product.

The proposed Foxwood Dam project will have both positive and negative impacts that include stimulation of the economy, relocation of dwellings and infrastructure, increased tourism opportunities, job creation and skills development, stimulation of small businesses and construction impacts. However the net effect of the proposed dam and irrigation scheme will be to provide a long term stimulus to the local economy by supporting the agricultural practices in the area and creating sustainable business and employment opportunities.

7) *CLIMATE CHANGE STUDY*

Climate change scenarios for the Eastern Cape suggest that the Province will experience an increase in the annual average temperature of two to five degrees Celsius. Although the area is likely to exhibit a pattern of drying, a higher frequency of flooding and drought extremes is projected under the unconstrained global emissions scenario. Long term adaptation strategy models suggest that the Eastern Cape is one of the areas which show the highest risks in extreme runoff related events.

With the successful implementation of recommended mitigation measures, the proposed Foxwood Dam project does not pose significant long-term impacts on climate change. Furthermore, through the incorporation of adaptation responses into the detailed design and operation manual, it is possible to ensure that the proposed Foxwood Dam will not be vulnerable to climate change.

8) TRAFFIC IMPACT ASSESSMENT

The road network in the area will be affected by inundation of portions of Route R344, a provincial gravel road linking Adelaide with Tarkastad, and MR00639, which is a provincial gravel road used to bypass Adelaide. The traffic study, conducted on 11 May 2014, assessed traffic volumes at six junctions near the proposed dam.

The closure of MR00639 affects an estimated 19 trips per day that would be diverted through Adelaide and result in an additional combined travel distance of approximately 160 km per day for road users. It was concluded that the additional cost to these vehicles over a 20 year period would be less than the cost to re-align MR00639 around the dam.

The roads affected during the construction period by haulage of significant volumes of material between the quarry and the dam wall would require continuous maintenance to ensure safe operating conditions. The impact of construction haulage operations can be minimised by scheduling this to occur during low traffic periods.

9) PUBLIC PARTICIPATION

Public participation was initiated as part of the technical feasibility study for the proposed Foxwood Dam, which included targeted engagement with an Agricultural Technical Working Group and a Stakeholder Forum. Various meetings were held with these parties to discuss the project and the outcomes fed into the EIA process.

The primary tasks undertaken as part of public participation during the Scoping phase included compiling a database of interested and affected parties, notifying the affected landowners of the project, announcing the project, distribution of the Background Information Document, convening public meetings and authorities meetings to present the drat reports, and maintenance of a Comments and Responses Report.

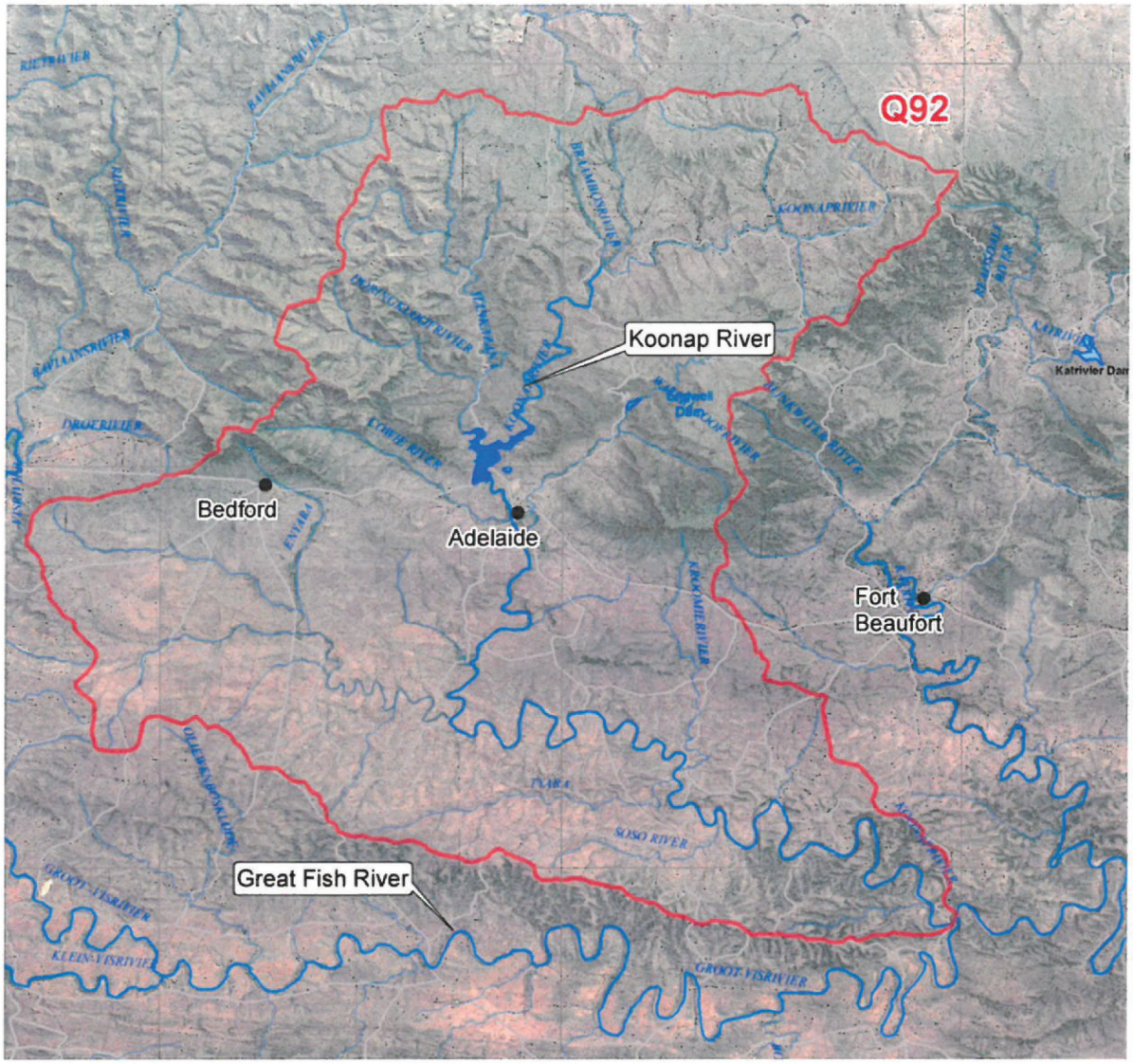
The draft Scoping and EIA reports were presented at public meetings and made available for public review at the library in Adelaide, Bedford and Bezuidenhoutsville, as well as at the Adelaide golf course. They were also made available to the relevant regulatory authorities and on the project website. Issues that were raised during public meetings, via emails and by post were recorded in the Issues and Responses Report, which was submitted to the Department of Environmental Affairs to inform the authorisation decision.

10) ENVIRONMENTAL MANAGEMENT PROGRAMME

An Environmental Management Programme (EMPr) was prepared and submitted together with the Environmental Impact Report for authorisation. The EMPr, which sets out environmental mitigation measures applicable during construction and operation, will be updated for approval by the Department of Environmental Affairs before implementation.

MRS N P MOKONYANE
MINISTER OF WATER AND SANITATION

DATE: 18.07.18



Proposed Foxwood Dam Location within Koonap River Catchment