water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

ENQUIRIES: Z Makhathini
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REFERENCE:

MINISTER OF WATER AND SANITATION

KLIPFONTEIN KRANTZ SECTION CANAL: 5 STONEY GATES NOT WORKING IN EASTERN CAPE

1. PURPOSE

1.1 To provide the Minister with responses to the email from DA Shadow Minister of Water and Sanitation, Leon Basson, MP on the status of Klipfontein Krantz Canal impact on the drought conditions in Eastern Cape.

1.2 To request Minister's signature on the attached letter, should Minister agree with the content

2. BACKGROUND AND DISCUSSION

2.1 The email request dated 06 March 2018 from the DA Shadow Minister of Water and Sanitation bears reference. (**Annexure A**).

2.2 The DA Shadow Minister of Water and Sanitation requested conditional status of the infrastructure and its readiness to support bulk water supply to the towns of Nelson Mandela bay and lower Sundays. The infrastructure includes:

- Lower Sundays River Canal
- Darlington dam

2.3 LOWER SUNDAYS

2.3.1 The lower Sundays Government Water Works (LSRWU) was constructed nearly 5 decades ago and conveys water originating from Orange River transfer system to primarily support agricultural water users and the Nelson Mandela Bay Metro. It's a system of abstraction weirs, tunnels, conveyance canals, pipelines and balancing dams.

2.3.2 One of the main canals of the systems which conveys 40% of the Nelson Mandela Bay Metropolitan municipality failed suddenly on 17 May 2017 at a point where it is supported by an earth embankment.

2.3.3 Immediately temporary repairs of the conveyance alone were reinstated by repairing the failed section by plastic geo-membrane within a week. The repair methodology had to be temporal as users and municipality were running dry in a period of 14 days and the full major repairs were being estimated to take over six (6) months.

2.3.4 The temporal repairs are stable, however, reoccurrence of same failure mode of it being washed away in flood like conditions poses a moderate risk.

2.3.5 The Lower Sundays canal is currently under major permanent repairs with works targeted to finish December 2018. Estimated value of work is R25million.

2.3.6 The scope of work for the permanent repairs involves construction of the embankment and the concrete lining of the canal. The construction of the embankment requires importation of approximately 18 000m^3 of material. This gives a long duration of works of over six months.

2.3.7 The status of the canal is operational, stable and under control. The canal is being monitored weekly with controls in place should flood like conditions occur.

2.4 DARLINGTON DAM

2.4.1 Darlington dam is a Category three (3) Dam located on the Sundays River, some 35 km north west of the town of Kirkwood in the Eastern Cape Province. The catchment is large (approximately 16 700Km^3) and the dam functions primarily as storage for irrigation, industrial and domestic use. The dam was completed in 1922 and subsequently raised in 1935 and again in 1952.

2.4.2 The Dam is in an average condition and stable state. Only the mechanical and electrical equipment are in a poor state.

2.4.3 The mechanical and electrical components do not pose danger as the dam is being monitored and dam levels controlled so as to eliminate risk of dam failure. The full maintenance plan from our Dam Evaluation done in 2016 and condition is attached as **Annexure B**.

2.4.4 The reported components of the dam, the 2 Flood gates, 5 Stoney Gates and only 4 sleeve requires replacement which can only be done with the dam being fully rehabilitated and isolated.

2.4.5 The Dam is targeted for a full rehabilitation starting 2018 and is under assessment and scoping. Construction works are expected end of year.

2.4.6 The rehabilitation of the dam does not stop or interfere with day to day maintenance and monitoring controls put in place.

2.4.7 The water leaks reported were repaired timeously two months ago by plugging as the major repairs can only be done during rehabilitation when the major equipment is isolated.

3 IMPLICATIONS

3.1 Personnel

None

3.2 Financial

The total repair works of Lower Sundays is R25million and budget has been made available.

The Darlington Dam repairs require over R150million over two MTEF. Budget has not been confirmed.

3.3 Legal

None

3.4 Communication

None

4. OTHER COMPONENTS CONSULTED

4.1 The Chief Directorate: Infrastructure Operations and Maintenance was consulted.

5. RECOMMENDATIONS

5.1 The Minister note the responses to the email from DA Shadow Minister of Water and Sanitation, Leon Basson, MP on the status of Klipfontein Krantz Canal impact on the drought conditions in Eastern Cape.

5.2 The Minister signs the attached letter, should Minister agree with the content.

ACTING CHIEF DIRECTOR: STRATEGIC ASSET MANAGEMENT
DATE:

RECOMMENDATION(S) SUPPORTED/NOT SUPPORTED

DEPUTY DIRECTOR-GENERAL: NATIONAL WATER RESOURCES INFRASTRUCTURE
DATE:

RECOMMENDATION(S) SUPPORTED/NOT SUPPORTED

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RECOMMENDATION(S) SUPPORTED/NOT SUPPORTED

ACTING DIRECTOR-GENERAL
DATE:

COMMENTS:

MRS P TSHWETE, MP
DEPUTY MINISTER OF WATER AND SANITATION
DATE:

RECOMMENDATION IN 5.1 NOTED

RECOMMENDATION IN 5.1 LETTER SIGNED/ NOT SIGNED

NKWINTI GE (MP)
MINISTER OF WATER ANDSANITATION
DATE:

DARLINGTON DAM
DAM SAFETY INSPECTION OF MECHANICAL AND ELECTRICAL PLANT AND EQUIPMENT
SOUTHERN OPERATION – EASTERN CAPE REGION

The general condition, operation and maintenance of the mechanical and electrical plant and equipment were evaluated on 24 October 2016.

INSPECTION

There is no improvement on mechanical/electrical plant and equipment from the last dam safety inspection. The equipments are in poor condition. **It is recommended that refurbishment of mechanical/electrical equipment of Darlington Dam will be included under Dam safety rehabilitation programme.**

RECOMMENDATIONS

The following recommendations are made with regard to the maintenance of the equipment.

Levels of Priority:	Priority
Rectify as soon as possible	1
Rectify within two years	2
Rectify within five years	3
Rectify as soon as opportune	4

1. CRANE

1.1.	The design of the brakes on the crane long travel must be investigated and improved to ensure effective operation.	3
1.2.	The electrical control cabinets must be moved to a more accessible position.	3
1.3.	The top limit of the hoist must be changed to ensure required operational conditions.	2
1.4.	The access to the cross travel limits must be improved or the limits moved to a more suitable location.	3
1.5.	The wire rope and sheave wheel must be cleaned and lubricated with the pressurised lubrication system to prevent corrosion.	1
1.6.	The sheave wheel must be corrosion protected to prevent further corrosion.	2
1.7.	The crane must be cleaned and the bird droppings removed and kept clean. It is suggested that the opening for the wire rope be closed with wire mesh, leaving only sufficient space for the rope to pass through.	1
1.8.	The crane must be serviced, maintained and exercised regularly, in accordance with the requirements of the OHS Act as described in the departmental log books and to ensure that the crane will be operational when required.	1
1.9.	The control system is faulty and must be checked.	1
1.10.	The electrical box on the crane is tied with the rope. It must be fixed.	2
1.11.	The cabinet for the crane pendant is missing. New cabinet shall be installed.	2
1.12.	The crane is out of order and could not be tested.	1

2. SERVICE GATE

2.1.	The service gate must be subjected to a through commissioning inspection, at which the Sub-Directorate: Mechanical Engineering Services is represented, before acceptance of the installation.	2
2.2.	The condition of the under water sections of gate rails and screen guides must be established and if necessary replaced by divers or when the dam is at the lowest water level. The corroded rail guides should be replaced with a stainless steel guide arrangement.	3
2.3.	The need for replacing the sealing strips on the upper breast plate i.e. If the dam is to be operated at a higher water level must be established and implemented.	3

3. CREST GATES

3.1.	The degree of closure of the gates must be established and the gates lowered further, if possible, to improve the sealing of the bottom seal. If this does not solve the problem the sealing of the gate must be achieved with the aid of temporary sealing material. The side seals must be similarly improved. The leakage is causing accelerated corrosion and deterioration of the existing gates.	1
3.2.	The gates are in a poor condition and can not be considered to be reliable and available for opening at short notice. The need for the gates must be finally established and the system dealt with accordingly.	1
3.3.	The roller cages of the gates damaged by corrosion must be repaired and protected.	3
3.4.	The present method of replacing the gates with the spare gate must be clarified and the procedure documented. The method is a difficult, cumbersome and dangerous procedure.	3
3.5.	The gates on the higher level must be raised to a position above the high flood level.	2
3.6.	The spare gate must be repaired and made available in order that the other gates can be maintained.	3
3.7.	The gates must as such be removed, replaced or refurbished in such way that the dam can be considered to be safe and will not be damaged by gate failing in installed positions.	3
3.8.	If the gates are going to be retained the electrification of the gate hoists must be investigated and implemented to enable acceptable operating conditions.	3
3.9.	The working conditions at the hoists must be improved to ensure the safety of the operational and maintenance staff.	3
3.10.	If the gates are to be retained they must be refurbished and the corrosion protection repaired as soon as possible to avoid further damage to the gates.	3

4. RIVER OUTLETS

4.1.	There are 6 river outlets at three different levels. The river outlet No.3 has been refurbished with a Corrocoat system.	
4.2.	The seals of the sleeve valves must be adjusted to stop the water leaks.	1
4.3.	The position indicators must be corrected.	1
4.4.	The cause of the pit marks on the sliding surface must be investigated in detail and monitored for corrosion products. When corrosion products are noticed the pits must be treated.	2
4.5.	The corroded areas on the sleeve valves as well as the backfill pipe work must be refurbished to stop the corrosion from developing further and causing dangerous conditions for the operators.	2

4.6.	The valves no.2 & 5 developed oil leak on the rams. They must be repaired as soon as possible.	2
4.7.	Operating and maintenance manuals must be produced and incorporated in the dam manuals.	2
4.8.	The blank flanges of the middle level outlets must be replaced as soon as the outlet pipes can be closed on the upstream side.	3
4.9.	The sleeve valve outlet floor must be drained to ensure dry conditions for the equipment.	2
4.10	Hydraulic power pack (remote control section) has developed an oil leak. The leak must be rectified as soon as possible.	1

5. GENERAL

5.1	The safety conditions on the upper platforms of the gate hoists must be improved by the installation of suitable three tier handrails or appropriate kick-plates.	3
5.2	The housing of the gate control equipment must be improved if the present gate systems are going to be retained.	3
5.3	The access to the top of the wall must be improved to improve the safety and to allow for larger equipment to be moved onto the wall.	3
5.4.	The handrails adjacent to the crest gate must be refitted.	1
5.5.	The entrance onto the wall has been filled with soil and the handrails have been removed from that section to allow for access of large equipment. The access to the top of the wall has not been reinstated to its original condition.	3
5.6	The electrical power cables on dam wall are loose and must be properly anchored to the wall	1
5.7.	The operators must be trained to be fully acquainted with the equipment in order that they can safely and with the necessary confidence operate the equipment.	2
5.8	Access to the river outlet is not safe and must be improved.	1

6. OPERATING AND MAINTENANCE PROCEDURES

6.1 It is considered to be the responsibility of the Operational Personnel to implement the use of and ensure adherence to the procedures specified in the Logbooks and to inform the Maintenance Personnel of faults and maintenance procedures specified in the Logbooks.

6.2 Inspections by Competent Artisans must be done at regular intervals as also called for in the Logbooks to ensure reliability of the plant and equipment and to comply with the Occupational Health and Safety Act.

6.3 Provision is made in the Logbooks for Senior (Supervisory) Personnel to certify that the condition of the plant recorded in the Logbooks is a true reflection of the condition of the plant and equipment. This is essential to ensure that the plant and equipment is correctly operated and adequately maintained and complies with the Occupational Health and Safety Act at all times.

P PRAZAN
CHIEF ENGINEER
STRATEGIC ASSET MANAGEMENT
DATE: 09/11/2016

J KOLAROVIC
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