

**ROTHERHAM BOROUGH COUNCIL**

<b>1. Meeting:</b>	<b>Cabinet</b>
<b>2. Date:</b>	<b>18<sup>th</sup> June 2014</b>
<b>3. Title:</b>	<b>Firsby Reservoir. Ward 14 Silverwood</b>
<b>4. Directorate:</b>	<b>Environment and Development Services</b>

## **5. Summary**

To seek approval for a range of further works at Firsby Reservoir following on from the urgent works in December 2012.

## **6. Recommendations**

That:

- i. Approval is given for Firsby Reservoir to be retained in its current form (subject to any required minor works) and certification to be sought to have the reservoir 'discontinued' under the Reservoirs Act 1975.**
- ii. Approval is given for the appointment of a Qualified Civil Engineer to formally approve the further works required for the 'discontinuance' of the reservoir.**
- iii. Approval is given for the minor works required and for a range of mitigation works associated with the discontinuance and for works to improve access, to remove silt from the reservoir, and other minor associated works.**
- iv. Approval is given for a maximum of £125,000 of expenditure to fund items i) to iii) above. The associated borrowing costs of £25,000 of this expenditure to be met by the Service, using the identified savings, and the associated borrowing costs of up to £100,000 expenditure to be met corporately.**
- v. A further report be brought to Cabinet should early contractor involvement indicate any significance variance in the estimated cost of the further works becomes apparent.**

## **7. Background, Proposals and Details**

### **Background.**

Firsby Reservoir is actually two connected reservoirs, one significantly larger than the other, and had been under exceptional inspection and observation since concerns over the dam's integrity were raised late in 2011.

On Monday 8<sup>th</sup> October subsidence was found in the dam crest. Subsequent emergency pumping and the creation of a notch in the main dam, protected by concrete on its base and sides were undertaken in poor weather conditions primarily during November 2012.

Due to the expiration of dates set down in the 2011/12 section 10 report (under the Reservoirs Act 1975) for completion of 'matters in the interest of safety' and the possibility of notices and/or enforcement action by the Environment Agency in respect of this report, a new section 10 report was called for. This superseded the previous report and therefore prevented any enforcement action or notices, and gave an initial insight into any further works that would be required to supplement these interim emergency works.

The reduced water level of the reservoir took its capacity to below 25,000 m<sup>3</sup> and by virtue of such, the reservoir can be considered for 'discontinuance'. This means that it can be removed from the Register of Large Raised Reservoirs and not subject to inspection under the Reservoirs Act 1975 or enforcement by EA. This will yield savings of approximately £1,500 in inspection fees and charges – approximately 30% of the annual inspection cost, which will be used to part fund the borrowing costs in relation to the required capital expenditure. Discontinuance could be certified in essentially in its current form (with the smaller lake effectively dry and therefore only one lake remaining) or could be in the form of further works to remove completely the dams and lake(s).

The new section 10 report (2013) outlines the two options available to the Council, namely discontinuance and rehabilitation. Options for rehabilitation include a complete rebuild of the main dam, or a lesser scheme aimed at removal of the connection between the main dam and the smaller dam, such that the smaller dam can be allowed to refill. Should either rehabilitation scheme be implemented, then previous recommendations in respect of 'matters in the interest of safety' are repeated in the new section 10 report, namely the spillway chute needs to be refurbished and the disused valve chamber in filled or refurbished. Other significant works would clearly be required to achieve the rehabilitation, whatever its form. Rebuilding the main dam returns the site to its previous form with maximum potential for wildlife. The discontinuance option facilitated by the interim emergency works but retaining a water body is likely to require further smaller scale works to the areas of the main dam showing seepage holes and depressions previously and leaves the reservoir in essentially its current form.

## Details

During 2013 the reservoir has continued to spill over the new lowered spillway. The extensive drying out of the reservoir in previous years has not been seen, presumably due to the reservoir water level now being below the level of the seepage holes previously observed. The reservoir now has a volume of approximately  $\frac{1}{4}$  and a water area of  $\frac{1}{2}$  of that before the emergency works. These levels therefore appear sustainable. The site's Local Nature Reserve status declaration is linked to the presence of open water. A discontinuance that involves the complete removal of the water body is therefore not recommended; this is also likely to be more expensive than a discontinuance in the form of 'retaining what has already been achieved' following the emergency works.

The site has developed naturally over the summer of 2013 and the new shoreline areas have been colonised by vegetation.

## Proposals

It is proposed therefore that the site is discontinued in its current form. This option is the least expensive in terms of capital expenditure and has minimal ecological impact. In considering what mitigating ecological works need to be included to bring the site back into a good ecological status, the site recovery indicates that wetland planting is not necessary. However, a range of other measures are proposed, linked to a greater or lesser extent to the lowered water level following the emergency works, and conversely to a greater or lesser extent to lack of recent maintenance, but all helping to reassure users of the site of Council's continued commitment to the site as well as minimise ecological impact. These include:

- Scalping of the shoreline of the larger lake to create opportunities for wading birds.
- Importing large boulders to the downstream area of the new spillway to help protect the spillway sides and the receiving watercourse, and also to prevent quad bikes and similar from damaging the spillway sides and gaining general access to the site.
- Eradication of self set willows from around both reservoirs and the dams.
- Removing developing scrub on acid grassland below the small dam which will assist with future access to the dam crest.
- Thin developing alder and oak on the water body margins and at the upstream areas of the site where the watercourses enter.
- Hedgerow management especially along footpaths
- Screening especially along north eastern edge of larger reservoir to lessen disturbance to loafing wildfowl, particularly Teal, in winter.

The above measures together with associated management in the long term will create a new ecological mosaic of habitats that will support a good range of bird species and other wildlife. Despite a small number of breeding bird species likely to be lost due to the reduction in open water area, the new layout will support existing and new species.

Discontinuance of the reservoir in this form will mean that health and safety legislation in respect of open water bodies will still need to be complied with. The majority of the structures associated with the reservoirs will also be retained and will need to be maintained (in regard to the bridges) and kept visible with restricted public access (in regard to spillway and channel walls with drops behind).

## **Other Matters Requiring Action or Consideration**

### Access Issues.

Access to a field to the south of the small reservoir via the connecting channel bridge is claimed by the owners of Reservoir Cottage, the cottage being adjacent to the site. This is being checked by estates and legal officers but is believed to have foundation. Alternative access is available via the stock entrance on Garden Lane, the small reservoir dam structure, and the spillway bridge. This route will need to be supplemented by some minor earthworks to ensure its usability for farm vehicles in future.

### Conisborough Conduit and Related Issues.

The Conisborough Conduit drains land to the east of the reservoir site and previously flowed through the two dams and then into the 'High Level Conduit' linking Firsby Reservoir to Thrybergh Reservoir. This latter conduit is affected by back falls due to mining subsidence.

The Conisborough Conduit through the dams was lost as part of the emergency works; flows were diverted via an existing alternative channel direct to Firsby Reservoir. This has helped to ensure the water levels in Firsby have been maintained.

The contribution of the High Level Conduit (HLC) to Thrybergh Reservoir is uncertain. Thrybergh's catchment is small and has in recent years suffered from lack of inflow causing reducing water levels. Inflow from the HLC has been very sporadic and only occurred at time of exceptional rainfall. The Conisborough Conduit contribution to the flow in the HLC has now been lost. The other contributor is the unnamed watercourse inflowing to the smaller reservoir at Firsby; this can be diverted by hand at the head of the reservoir to the HLC. Much of this control structure has been buried beneath silt, but was partially re-exposed during the emergency works and utilised in order to reduce the inflow to the reservoir and therefore the pumping required. Some inflow to Thrybergh Reservoir was witnessed.

It is therefore considered prudent to remove the silt from around this structure and undertake any associated works required to ensure that this control structure is re-established. This will offer control over this stream flow should Thrybergh Reservoir require supplemental inflow at times of low rainfall.

A further supplement to flows to Thrybergh Reservoir to replace the loss of the Conisborough Conduit is the provision of a new grip to the rear of Gulling Wood Drive in Thrybergh. This area currently suffers flooding from run off from adjacent land around the former Silverwood Siding belonging to Network Rail. Network Rail have indicated agreement in principle to the provision of this grip, which will link to

Silverwood Brook and then on to Thrybergh Reservoir. Small capital works of the kind envisaged will solve both the flooding problems and supplement Thrybergh Reservoir in flows and therefore water levels, and are therefore considered worthwhile.

#### Agricultural Land and Drainage Tribunal.

Prior to the emergency works at the end of 2012, claims were made Mr C Cooper regarding the situation to the main reservoir and its affect on flows in Firsby Brook and ultimately that this causes flooding to his land that adjoins the reservoir site. It was anticipated that the Firsby emergency works would alleviate – with time – this situation as the lower water level resulted in a larger differential head between the Firsby Brook where it entered the reservoir and the reservoir water level. Mr Cooper approached the tribunal through his solicitors and in response to the tribunal the Council has made them aware of other factors having an influence on the alleged flooding, most notably the local topography and the lack of evidence of any land drainage. However, the expert appointed by the tribunal has essentially found in favour of Mr Cooper and recommended *'that an order made for ditching works to be carried out.....into and extending through the silted area of Firsby Reservoir'*. The report continues that *'the creation and retention of the channel through the upper reaches of the reservoir will be difficult as the silts are very unstable. Some dewatering may be required and a channel (will need to be) formed using geo-textile to give bank stability'*.

The Council has been invited to make a response to the expert. The Council has accepted the report (which does also acknowledge the topography issues and that Mr Cooper's land may still flood) and has asked that time be allowed for the works be undertaken in the summer to reduce likely costs and ecological impact. The formal tribunal order is expected imminently.

The requirement for significant earthworks in the silted area - effectively an extensive marshland type of environment/habitat is clearly an additional complex element of engineering works and will require professional advice and appropriate contracting expertise although the lower water level achieved through the emergency works assists with both the complexity of the works and the access.

#### Qualified Civil Engineer (QCE)

The Council is required to appoint a Qualified Civil Engineer to oversee and certify either the discontinuance works (further smaller scale works to the areas of the main dam showing seepage holes and depressions previously) or the rehabilitation. The QCE has confirmed that any works to the upper reaches of the reservoir to recreate the ditch in the silted area are not part of his jurisdiction and do not require certification by the QCE.

## **8. Finance**

Expenditure on the elements above is extremely difficult in the absence of data on similar works and the uncertainties and risks of what is involved, e.g. depth and

stability of the silt in the marshy ground at the head of the reservoir. It is likely that works will have to be procured on a cost reimbursable basis.

Budget figures are as follows:

Appointment of QCE	£5,000
Discontinuance	£10,000 to £30,000
Discontinuance Mitigation	£10,000 to £20,000
Access improvements	£10,000 to £20,000
Railway Drainage	£5,000 to £10,000
High Level Conduit	£5,000 to £10,000
Tribunal Works	£10,000 to £30,000.

It is therefore proposed to seek up to an additional £125,000 to undertake the above works. The use of the Midlands highway Alliance (MHA) framework contract is being considered as a procurement option due to the emphasis on early contractor involvement and the uncertainty regarding the scope of the works that will ultimately be required. The borrowing costs associated with £25,000 of this expenditure will be met by the service using the identified £1,500 per annum savings. The remaining annual borrowing costs of £5,500 will be met corporately.

## **9. Risks and Uncertainties**

The discontinuance option chosen – ‘retain as existing’ incorporates the use of the emergency scheme completed at the end of 2012. These works were described as ‘limited lifespan’ but have not shown any deterioration in the 15 months since completion.

The further works are primarily earthworks and ground conditions for works and access are uncertain in many cases. Earthworks will be vulnerable to any extreme weather conditions. It is intended to reduce this to a minimum by undertaking the works in summer, which will also reduce the risk of any significant ecological impact.

The discontinuance works will be undertaken under the supervision of the All Reservoirs Panel Engineer and in line with the requirements of the Reservoirs Act 1975. Failure to undertake the discontinuance work will mean enforcement action by the Environment Agency.

## **10. Policy and Performance Agenda Implications**

The proposal seeks to ensure reservoir safety and allows the reservoir site to continue to act as a site safe for the public to visit, which contributes to the following Corporate Plan outcomes:-

- More people are physically active and have a healthy way of life
- People enjoy parks, green spaces, sports, leisure and cultural activities

## 11. Background Papers and Consultation

Minute number 51 of the Cabinet Member for Regeneration and development Services, 15<sup>th</sup> October 2012.

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