

15/10/2016

## UNRESOLVED ISSUES THE NOTHERN COLLECTOR TUNNEL

These are the issues that the [Saveaberdarivers.org](http://saveaberdarivers.org) Community Group considers to be unresolved and why the construction of the NCT project should not have started or be proceeding now. The community group consists of farmers, business people and professionals from Murang'a County.

All the issues have been identified from **ESIA EIA-1188** and the Murang'a County "**Report of the Technical Committee on Northern Collector Tunnel Project**", *hereinafter shortened as Murang'a Technical Report or TR.*

All the issues are technical and easy to validate by reviewing the available ESIA, Technical reports and the NEMA license appeal documents. **We urge those with a genuine desire to understand why these issues are so dear to county residents to study ESIA- EIA-1188 and the Murang'a Technical Report. Both reports are available from: <http://saveaberdarivers.org/>**

We recognize that other groups may have similar or different issues. We urge County leaders not to mix technical, and environmental issues with political or governance issues. Construction of the tunnel should stand on its merits. While other issues such whether AWSB should compensate the county for the water or provision of water to county residents are important, they should not be used to justify construction of the tunnel if the technical and environmental issues are not resolvable.

### UNRESOLVED ISSUES:

1. To fulfill the World bank (WB) funding and the Kenya government environmental requirements, a consultant was engaged by AWSB to prepare the ESIA. **ESIA- EIA-1188** was approved and released by AWSB on 4<sup>th</sup> November 2014, as an authentic document for public review and comments.
2. **ESIA item 7.3.5**, we quote, "Studies have shown that tunnels can lead to drying up of springs and streams leading to severe socio-economic and ecological effects. ...". This finding was reconfirmed on Murang'a Technical Report **Item A.3.3.f**.
3. **ESIA item 7.6.1**, conveyed the message that rivers downstream would potentially be having zero flow or near-zero flow. Zero flow may mean dry river beds. This was reconfirmed by the Murang'a Technical Report **Item A.3.3.b and d**.
4. The AWSB disregarded its own EISA report as illustrated by the following:
  - I. There is possibility of creation of water conflict to downstream water users as a result of reduced water flows, as observed by WRMA's Upper Tana sub-

regional manager. Refer to Appendix VI-II: **Stakeholder consultation forms and notes to meetings, WRMA stakeholder consultation guide page 3.**

- II. Paragraph 6.2.1 of the ESIA report, according to the Murang'a County WRMA, Service Water officer, the Irati River is "tapped". Based on this information, the AWSB should not be withdrawing water from the Irati River.
5. The ESIA author stated that they did not have sufficient, hydro-geological data along the tunnel alignment. Drawings appended on the ESIA had a clear disclaimer stamped, **"Provisional pending geo-technical investigation"**, confirming that the soil/ rock structure along the tunnel alignment had not been studied, at the start of construction. Therefore, aquifer or underground water information along the tunnel profile unknown to the tunnel designer or the contractor.
6. AWSB should carry Geo-technical investigation and map existing aquifers along the tunnel profile, before extending the tunnel. They should take **ESIA EIA1188** item 7.3.5 regarding drying up of streams and rivers seriously.
7. We are concerned about impacts of excavating an 11.8 kilometer 3 meter diameter tunnel in a terrain which has loose "easily eroded soils" and potential for "landslides" without Geo-technical, hydrogeological studies, and confirmation of impacts to underground aquifers, streams. **Refer to Murang'a government County TR, page 70, under the ESIA disclaimer titled "Limitations of the Design"**.
8. We note the concern expressed by the ESIA author, about potential leakages in the concrete lining of the tunnel. Our concern is how ruptured aquifer would be sealed in a large concrete lined tunnel that is prone to water leakage.
9. We have noticed from the videos that have been released in the last two weeks that there is a lot of water in the tunnel, which demonstrates the validity of Item 6. Uninterrupted, this water feeds streams that people depend on. Progressively, that bleeding of aquifers destroys the grounds capacity to hold water for streams.
10. The **ESIA- EIA - 1188** consultant recommended use of a Tunnel Boring Machine (TBM), but we understand that the tunnel is being excavated with less exact methods.
11. We understand that explosives might be used during tunneling. When explosives are used to blast through the hard rocks along the tunnel, large irregular cavities are created. How will the contractor seal the large voids/spaces between the tunnel wall and the large irregular cavity created by explosives? Will these large unsealed cavities create alternative underground drainage routes that will damage aquifers permanently?

12. What safety measures have been put in place to address potential water intrusions within the proposed tunnel, while using explosives to blast through rocks that separate various aquifers?
13. Since the water demand for the Metropolitan and county is elastic over time, and in order to make the project appear feasible, the AWSB has underestimated the current and long term domestic, industrial, recreational and environmental water needs of the County and ecosystems. This has been validated by the Murang'a County government TR. **Refer to Section a 3.3. for instance:**
- I. The County estimates that only 35% of the County population has access to water. The AWSB has asserted that 70% of the county population has access to water. The 40% difference works to the benefit of AWSB as it makes the county appear less needy and frees more water for the tunnel.
  - II. In order to maximize flow extraction from the rivers, the AWSB has used a static allocation formula and very low growth rate for the county residents, agriculture and industry. The AWSB has conveniently failed to recognize that as county residents achieve the 2030 Vision, life styles will change; small towns will become bigger cities, communities will require more water for agriculture and recreation. Already towns like Maragua, Kenol are experiencing rapid growth, without reliable water supply.
  - III. According to the Murang'a county TR, if the tunnel project is implemented, the County will run out of water by 2035.
  - IV. Equitable sharing of water would require the AWSB to develop a predictive model for all the Aberdare river basin, based on population growth, life style trends, climate change etc. The model would establish equitable guidelines for sharing the rivers between all users.
14. To overcome resistance from community and elected leaders, The AWSB has responded by categorizing the intended withdrawal from the rivers as “**flood flows.**” The Murang'a county Government TR stated that this categorization was “**technically flawed**” and “**misleading**”. This is because to the average person, flood flow has a very different meaning from its hydrological definition. In any case, the AWSB has designed the NCT to function at  $Q^{95}$  and not “flood flow”.
15. The Murang'a County government TR recommended that in order to mitigate the risk of “**low and zero flow**” downstream of the NCT intakes, the minimum reserve flow shall not be less than  $Q^{50}$ . This requirement implies that the AWSB should recalculate the flows delivered at  $Q^{50}$  (**will be far much less**) and establish if it is still cost effective to construct a tunnel to deliver a fraction of the original intended flow.

16. In a Consensus agreement between the County and WASB, the Board offered to withdraw  $Q^{80}$  flow for some rivers, contrary to the  $Q^{50}$  limit. In any case, the AWSB is still messaging that they will deliver 140,000 cubic meters per day, which implies that they will not modify the weir design to function at  $Q^{80}$ .
17. Based on monthly flows of the three rivers, the flow extraction regime that is described in ESIA **EIA-1188**, Section 4.11(ii) has a **contradiction or design flaw**, which makes us believe that the AWSB has no intention of implementing the operating structure that has been recommended in justification of the tunnel. The contradiction is – according to the AWSB the primary function of the NCT project is to deliver “**flood flow**” from the three rivers to the Thika dam. However, from operation records of the dam, the dam has a “steep” fill curve and fills rapidly from its current catchment and remains full until the rains cease. From the Murang’a County TR – “**Flood waters from the NCT is probably not very useful for the project as the dam fills in 1.5 months and spills for three months during the rainy season --- thereafter the scheme ( dam) is sustained by normal and base flows**”.
18. From 16, Introduction of additional flood flow from the NCT project has minimal impact on the ability of the Thika dam to alleviate water scarcity to the Nairobi Metropolitan (dam is full now, and still there consumers who have not had water for months).
19. Transmission and distribution of water in the Nairobi metropolitan is dependent on the current, inadequate transmission and distribution pipe network. The NCT project could only improve flow to the Nairobi Metropolitan during the dry months when inflow to the dam is from river(s) normal or base flows.
20. From 18, the need for water for the **downstream communities and the Nairobi Metropolitan is more urgent during the dry period**. According to the proposed Operating Structure, and in order to accommodate downstream flow requirements, the tunnel would be required to shut down during periods of low flows, or take extremely low volumes. This could be **4-6 months in a year** which raises the listed issues:
  - I. Is it cost effective to spend billions of shillings to construct a tunnel that moves flood flow from rivers to The Thika dam during the rainy season and then immediately spill (waste) the water due to the low “buffering” capacity of the dam? Note that spilled water is extremely valuable to downstream farmers. The seasonal flooding is a primary contributor of food security in the region since the flooded areas retain moisture for a long time and can be farmed even during the driest season. Wasting this flood water will increase poverty in Murang’a County.

- II. The rivers flood only for a short duration during the two rainy seasons. If the intention is to withdraw flood flow, the tunnels could be shut down for 4-6 months in a year when water is needed the most in the Nairobi Metropolitan. Does this make economic or environmental sense?
  - III. Our conclusion is that (1) the AWSB has not reviewed the tunnel option thoroughly or is using the ‘flood flow’ categorization as a ruse and the real intention is to target the normal river flows with no commitment to implement the Operating Structure. They can do this because the local community has no role in the design and operation of the tunnel after it is commissioned. The Murang’a County has Murang’a County *“Report of the Technical Committee on Northern Collector Tunnel Project”* identified this flaw in its report. **Refer to Section 2.2.2 (Reservoir hydrology at Thika Dam).**
21. AWSB should disclose whether the tunnel is designed with adjustable weirs which will reduce flow to the tunnel as the water needs of the County increase over time. Otherwise, static weirs will result in the county experiencing progressive flow reduction.

#### **OTHER ISSUES:**

1. The Murang’a County government TR clearly stated that the NCT project is not feasible as designed and significant conversation would be required between the AWSB, the County government and stakeholders.
  - I. The AWSB has ignored this recommendation and entered into a Consensus Agreement with the County.
  - II. The consensus Agreement hardly addresses the primary issues as described in ESIA EIA-1188 and the Murang’a County TR.
  - III. The original panel had 30 members. Only a few of the members have signed the Concensus Aagreement. Did the original panel accept the Consensus Agreement, which appears to have modified the TR.?
  - IV. We are also concerned whether some of those who have signed the agreement on behalf of the County and AWSB may have no authority to sign such a document, which would invalidate the agreement.

2. The appeal of the NEMA license that was issued to AWSB has progressed from the NEMA Appeal Board to the court of Appeal. **It is case # NAI.309/2015, Joseph Kuria Mwangi vs Athi Water Service Board & 2 others.** It was last heard on 31 May 2016. AWSB were given time to respond to the affidavit. This has not happened. So the matter is still pending in court.
3. Some county leaders have been quoted as saying that they have confidence in the project since it is funded by the World Bank and the WB does not fund bad projects. The AWSB also cited this reason in an affidavit for: **Joseph Kuria Mwangi vs Athi Water Service Board & 2 others.** After judgement, we sought clarification from WB to confirm that they have reviewed ESIA 1188 and accounted for all the negative impacts. In response, the WB has appointed an International Panel of experts (IPE) to review the project. Information regarding the IPE is available from the AWSB website.

As dedicated citizens, we recognize that water is a national asset and critical component for the achievement of 2030 Vision goals. We are very eager to support and contribute towards the improvement of water service delivery to the Nairobi Metropolitan. We have suggested that if the AWSB genuinely intends to skim flood flows from Aberdare Rivers and establish a dependable water source, they should consider building dams and treatment plants further downstream. Dams will benefit from an expanded catchment and not be subject to seasonal hydrological fluctuations. They will also eliminate most of severest impacts, including creating water deficit in Murang'a and other downstream Counties, which would stunt the achievement of V 2030 targets in the Counties.

Thanks for listening to us.

Sincerely,



Paul M. Kimani, PE, MASCE

On Behalf of: <http://saveaberdarerivers.org/>