**Methodology for re-excavation of Rivers and Khals manually or by mechanical equipment for HFM&LI Project.**

1. The Khals which are to be dredged and excavated should be demarcated to the lines shown on the drawing. The work should be done as per design and specification mentioned in the tender document. Initially Centerline alignment of khalsshould be fixed by the field office, Consultant and the contractor.

2. Pre-work and post workof the khal/river should be taken jointly by the field office, Consultant and the Contractor with the following equipment. a) DGPS, b)Total station, c) Level Machine.

3. Spoils should be spreaded layer by layer keeping minimum 10m from the bank line of the khal. There should be some gaps between the spreadedspoil so that drainage facilities are not disturbed. No haphazard deposition of excavated earth will be allowed.

4. Bailing out of water should be done with low lift pump, shallow pump & mud pump. No excavation of earth will be allowed without bailing out of water.

5. Excavation of earth should be executed in dry bed condition.

6. No part work of the excavation/re-excavation of khal shall be accepted by the project authority. The excavation/re-excavation work will be accepted only after completion to its full design section.

7. The contractor should own or hire the following equipment's which will be used for re-excavation of khal/river (a) Long Boom Excavator (0.7m3)-1no for each 2-3km reach, (b) Dredger -18 inch (c)Low lift pump (2hp) (d) Shallow tube-well pump(2hp), (e) Mud pump (3cusec),

8. Every sequence of re-excavation work should be recorded by video with date and time for future record.

9. The cutting chart should be prepared by the contractor and it should be accepted by field office as well as consultant. The cutting chart should be available at site during inspection.

10. Excavation work shall be done from outfall (D/S) of the river/khal towards the off-take (U/S).

11. A smooth transition shall be provided between the excavated section of the river/khal and the existing section.

12.A smooth transition 1:50 shall be provided at point where design bed width or bed level changes.

13. BM/TBM pillar established by IWM (as mentioned in the drawing) should be used as reference for survey of this excavation work.

14. After completion of the work cross dams should be cleared for continuous channel flow.

15. As built drawing of the re-excavation work should be submitted by the contractor before submission of the final bill.

16. All instructions and specifications mentioned in the approved drawing should be followed strictly.

17. To protect the environment of the project areas from any potential adverse impacts, the contractor must take mitigation measures in compliance with the Environmental Management Plan (EMP) during contract implementation period (Pre-construction and construction stage). EMP is annexed with the tender document.

18. The Project Director reserves the right for the inclusion of any other points in the methodology if required for the smooth execution of works.