

I/272282/2023

No. 48-5297/2021 (FCA)

H.P. Forest Department

From Nodal Officer-cum-APCCF (FCA),
O/o Pr.CCF, H.P, Shimla-1.

To

The Assistant Inspector General of Forests,
Govt. of India, Ministry of Environment, Forest & Climate change,
(Forest Conservation Division) Indira Paryavaran Bhawan,
Aliganj, Jor Bagh Road, New Delhi-11003.

Dated Shimla-1, the

Subject: **Proposal for seeking prior approval of the Central Government under FCA, 1980 for non forestry user of 211.8427 hectare of forest land for the construction of Dugar 500 MW Hydro Electric Project in favour of NHPC, under Pangti Forest Division Distt. Chamba Himachal Pradesh. (Online No. FP/HP/HYD/123533/2021).**

Sir,

Kindly refer to GoI, MOEF and CC letter No. 8-15/2022-FC dated 26.06.2023 on the subject cited above.

2. The point wise observation raised vide above referred communication is attended as under:-

1. The status of 04 CA sites namely Phindpar and Rogi falls under Demarcated Protected Forests notified vide notification No. 3.3.74/74-SF (part II) dated Shimla, the 15th October,1976 under sub-section (3) of section 29 of the Indian Forest Act, 1927 (copy enclosed). Whereas according to working plan of Pangti Forest Division Killar Dhar-1 and Killar Dhar-2 falls under Gahars and Dharas (copy enclosed), which is Un-Demarcated Protected Forests (UPF).
2. User agency has submitted that NOC for mining activities of the project has been obtained form Mining Department vide letter dated 28.10.2023 (copy uploaded on the portal). For meeting the requirement of coarse and fine aggregates, three rock quarry sites such as Dugar Rock Quarries (DRQ) have been identified and marked as DRQ-01 (Quarry site 1:- Upstream of Punto Hasku Bridge), DRQ-2 (Quarry site2:- Downstream of Punto/Hasku Bridge), and DRQ-6 (Quarry site 3:- Near village Dharwas) and two River shoal deposits/Barrow area (FAS-01 Near Tail Race Outfall and FAS-02 Tail end of Reservoir near Findru village are proposed for quarrying of construction materials. For this purpose, total of 8.625 ha. Quarry area and 3.880 ha. Borrow area have been proposed for diversion of forest land under this forest proposal. The EIA/EMP studies had been carried out by independent Environment consultant and landscaping restoration plan of quarry area has been proposed under EMP. The EIA/EMP study was appraised/ examined by Expert Appraisal Committee (EAC) OF MoEF&CC, New Delhi in meeting held on 29-08-2022, where-in EAC has recommended for grant of Environment Clearance. For approval of Mining Plan of above quarry sites and Barrow areas from Government of Himachal Pradesh on-line mining application has been submitted by project to Geological wing, Department of Industries, Govt. of HP. After examination of the proposal, State Geologist vide letter dated 29.09.2022 has framed a Committee comprising of officer from Forest, PWD, IPH, HPSPCB and Mining under the Chairmanship of

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- SDM, Pangri for Joint Inspection. The Joint Inspection for approval of mining plan has been done by the Committee on 02.06.2023; therefore, approval of Mining Plan of above quarry sites and Borrow areas from Government of Himachal Pradesh is under progress and will be submitted as soon as approval has been obtained from competent authority.
3. The mitigation plan for restoration of quarry sites has been proposed under EIA/EMP study. After excavation of the required material, these quarry sites will be restored using various engineering, bioengineering and biological measures. The copy of Mitigation and Restoration measures proposed in EMP is enclosed as Annexure-II. The EIA/EMP report was appraised/examined Expert Appraisal Committee (EAC) of MoEF&CC, New Delhi in meeting held on 29.08.2022. Where-in EAC has recommended for grant of Environment Clearance. Hence, Mitigation plan will be implemented to avoid the adverse impact on ecology and environment of the area due to mining.
 4. In this regard CCF Chamba has reported that the counting of saplings/poles of girth size 0-30cm (0-10 cm DBH) will take time approximately one -two months and he undertaken that counting of these sapling will be carried out and shall be submitted well before stage-II approval. The large-sized trees of Girth Class 121-150 cm and > 150 cm have been recorded in part-II and properly filled as per category of Girth Class on Parivesh portal. Under taking of DFO Pangri is uploaded on point No. 24 Part –II.
 5. The Cost Benefit ration of the project has been revised & enclosed as Annexure-IV and same has been uploaded on Parivesh portal.
 6. The cost of the project has been rectified to Rs. 398734 lac as per CEA, Ministry of Power's letter No. CEA-SY-25-44/3/2020-PAC Division/74-115 dated 26.04.2020 on Parivesh portal.
 7. Needful has been done according to revised rated of NPV prescribed vide letter dated 06.01.2022 and same has also been uploaded on Parivesh portal as additional information.
 8. Pangri area is habitant of unique endemic tree species of Pinus geradina and Corylus spp. Plantation of these unique endemic species will be encouraged under Compensatory Afforestation Plan, Catchment Area Treatment Plan, Green belt development plan etc. which are proposed with appropriate financial provision under Environment Management Plan of the project.
 9. It is intimated by CF Chamba that due to hearing in Hon'ble Court at Chamba, the site was not inspected with IRO Shimla. However, concerned Forest Guard was present during the site inspection.

Yours faithfully,

Encls. As above.

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vi. The State has mentioned in the CA scheme, that the Root stock is there in the proposed CA areas, however, the density is less due to grazing pressure. How the govt. Intends to mitigate the grazing pressure for proposed CA plantations is therefore required to be submitted.
Reply: Observation pertains to DFO, Pangi.

Annexure-I

vii. The Muck dumping (8.5797 ha) and the job facility area (7 ha) can be taken on non-forest land. The justification for proposing the same on Forest land may be submitted.

Reply: Muck dumping site involves 8.5797 ha forest land and job facility area involve 7.08 ha forest land as per requirement of the Project. The total land required for the construction of project is 220.62 ha. Out of which 211.84 ha is Forest land and the remaining 8.78 ha is Non-Forest land. As per requirement, a single patch of 8.5797 ha forest land has been identified and found suitable for temporarily disposal of muck, and 7.08 ha forest land has been identified and found suitable for temporarily job facility area (like batching plant, pre-fabrication yard etc). Both the temporarily muck dumping site and job facility area will be handed over back to the State Forest Department after completion of construction activities. After the completion of dumping activity, proper restoration plan with Biological and Engineering measures will be implemented for restoration of the dumping area. A suitable restoration plan has been proposed under the EMP for muck dumping site (copy enclosed from page No. 248 to 255). After the completion of work from job facility area, proper restoration plan with Biological and Engineering measures will be implemented for restoration of the job facility area. A suitable restoration plan has also been proposed under the landscaping and restoration plan of EMP Plan.

As per forest proposal of Part-I (D), Justification for locating the Project in Forest land and details of alternatives has been examined. Based on the investigation done on the three alternatives and considering all the Engineering and Environmental considerations it was decided to develop the project at this site, which has least probability of increase in area of medium geological risk.

Considering all the components / parameters of land requirement and design aspects of the Project, CEA has issued Technical Concurrence vide letter No. CEA-SY-25-44/3/2020-PAC Division dated 26-04-2022 (Copy enclosed from page No. 240 to 246).

The possibility of locating muck dumping site and job facility area in Private land / Non-Forest land in nearby area has been examined/explored in consultation with Officials of Pangi Forest Division and after carefully examine the possibility of muck dumping site and job facility area, it was found that No Private land / Non-Forest land is available in nearby area which is suitable for disposal of muck and job facility area. The area available in



एनएचपीसी लिमिटेड
(भारत सरकार का उद्यम)
NHPC Limited
(A Govt. of India Enterprise)
ISO-9001:14001 & IS 18001 Certified Company

डुगर जल विद्युत परियोजना (500 MW)
Dugar HE Project (500 MW)
डुज, किल्लार (पंगी), चंबा (हि.प्र.) 176123
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Private land / Non-Forest land is very far distance from project area and steep sloppy which is not possible to fulfil the requirement of dumping site and job facility area.

In view of above, it is requested to kindly consider identified single patch of 8.5797 ha forest land for muck dumping site and 7.08 ha forest land for job facility area as per forest proposal. Hope the above replies will satisfy the respective observations and after doing the needful action is re-submitted for approval of the competent authority.

धन्यवाद

Encl.: उपरोक्त अनुसार।

भवदीय,

(शशी कान्त)

महा प्रबंधक (प्रमुख),
डुगर जल विद्युत परियोजना

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NHPC OFFICE COMPLEX, SECTOR-33, FAIDABAD-121003 (HARYANA)
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Section 10.2.5

MUCK MANAGEMENT PLAN

10.2.5 MUCK MANAGEMENT PLAN

The excavation for construction of the project would generate about 3,70,880 cum of soil and 9,23,970 cum of rock. About 60% of rock excavated is expected to be used for producing coarse and fine aggregate for concrete production and as fillings for developing areas for construction facilities, etc. The total quantity of excavated common soil and balance quantity of rock excavated would have to be disposed of at designated muck disposal areas. Thus, considering swell factors 0.63 for rock and 0.80 for common soil, as adopted from CWC Guidelines, and redeposit compaction factor of 83%, the total muck disposal to be disposed of is about **716676 Cum** (see Table 10.19).

Table 10.19: Total quantity of muck to be disposed off

S. No.	Particulars	Soil	Rock
1	Total Excavation (Cum)	370880	923970
2	Less Used in Production of Aggregates (Cum)		553962
3	Balance To be Deposited (Cum)	378412	369308
4	Swell Factor, S	0.80	0.63
5	Re Deposition Factor, R	0.83	0.83
6	Quantity of Re deposits of Muck, (Q / S) x R, (Cum)	392602	486549
7	Balance Muck for Disposal at Muck Disposal Sites, cum	392602	324074
	Total muck to be disposed of (Cum)	716676	

Muck dumping plan involves selection of muck disposal site/s based upon environmentally sustainable guidelines, adopting suitable dumping methodology right from loading and transportation of muck from the excavation sites through 20T Rear Dumpers, management of dumping sites, providing protection measures at dumping sites, and monitoring of muck disposal process to ensure minimum spillage during transportation, dumping, and compaction, and then finally rehabilitation of dumping sites through revegetation.

10.2.5.1 Criteria for Selection of Dumping Site

The following points were considered and followed for finalization of the area to be used as a dumping site:

- The dumping site was selected as close as possible to the project area to avoid long-distance transport of muck.
- Standard distance between each dumping site and from the High Flood Level is maintained as per condition of Standard ToR, issued by MoEF&CC for Hydro Electric projects.
- The site is free from active landslides or creep and care has been taken that the site does not have a possibility of toe erosion and slope instability.

- The dumping site is either at a higher level than the flood level or is away from the river course so that the possibility of muck falling into the river is avoided.
- No active channel or stream is flowing through the dumping site.
- The site is far away from human settlement areas.

Keeping the above requirement, one muck disposal site has been identified downstream of the proposed powerhouse with a total area of 8.58 ha and capacity has been worked as 8,75,000 cum which is much more than the total quantity of muck to be disposed of (refer to **Figure 10.10**).

The area identified for dumping is planned on the banks of the nearest drainage and away from river HFL. The identified area is mostly gradually sloping near the riverbank. The drainage side bank of the area will be properly protected and stabilized with Gabions/ Retaining Walls of suitably designed sections (refer to **Figure 10.11**).

10.2.5.2 Preparation of Muck Dumping Site


The muck that needs disposal would be piled at ϕ (angle of repose) between 30° and 36° at the proposed dumping sites. For this, the slopes would be broken up by creating benches across the slope. This will be done to provide stability to the slopes and to provide ample space for planting trees, which would further help in holding and consolidating the material stacked at different sites. The description regarding the stabilization of the stacked material along the proposed roads has been discussed in the following paragraphs.

The dumping of muck shall be done in stages by allowing it to consolidate/settle through the monsoon, compacting the dumped muck with Bulldozer movement. The zoning of the dump will be done judiciously to ensure the stability of the 30° slope under all superimposed conditions.

10.2.5.3 Methodology of Dumping

The main objectives of the process of muck dumping and restoration of the muck disposal site are:

- to protect and control soil erosion.
- to create greenery in and around the muck disposal area.
- to improve and develop the site into a recreational site, if feasible.
- to ensure maximum utilization of muck for construction purposes.
- to develop the muck disposal sites/ dumping yards to blend with the surrounding landscape; and
- to minimize damages due to the spillage of muck in the project area.


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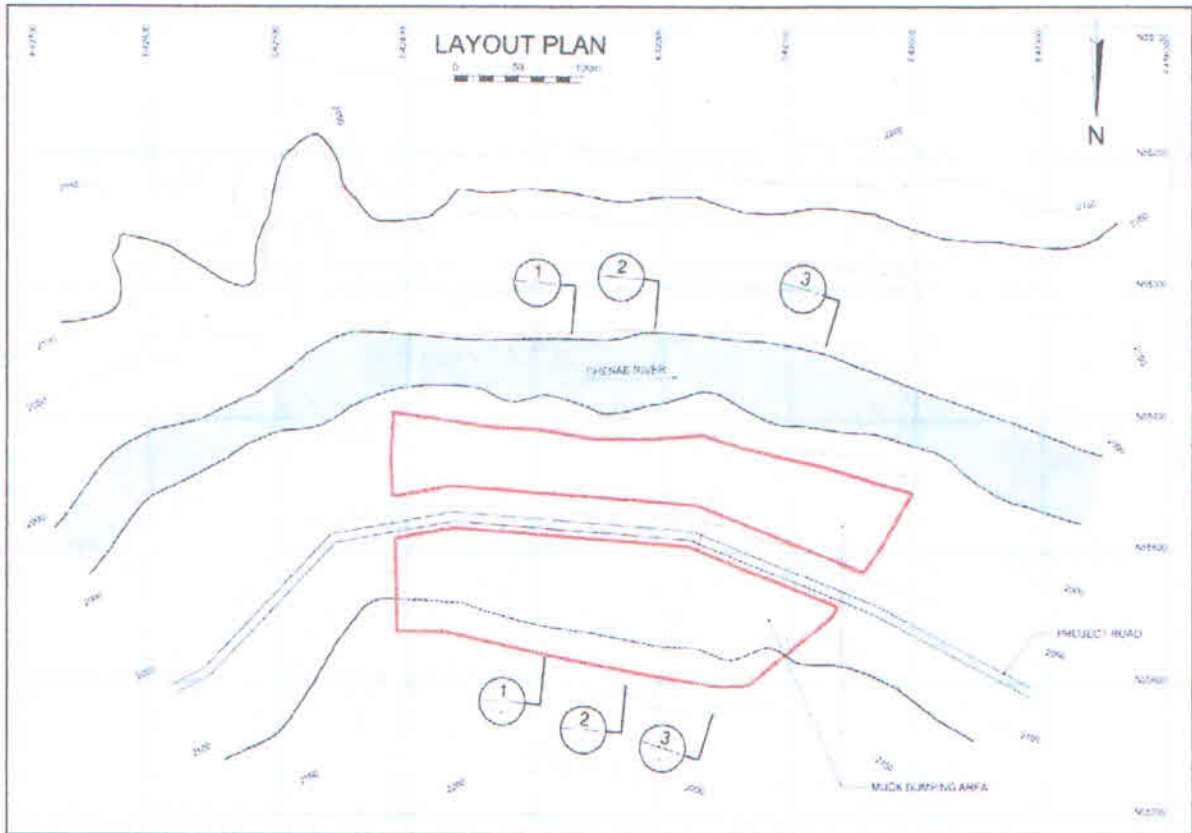


Figure 10.10: Layout of Muck Disposal area

(Signature)
General Manager
Dugar Hydro Electric Project
Nagwan, Dist. Mandi (H.P.)-173121

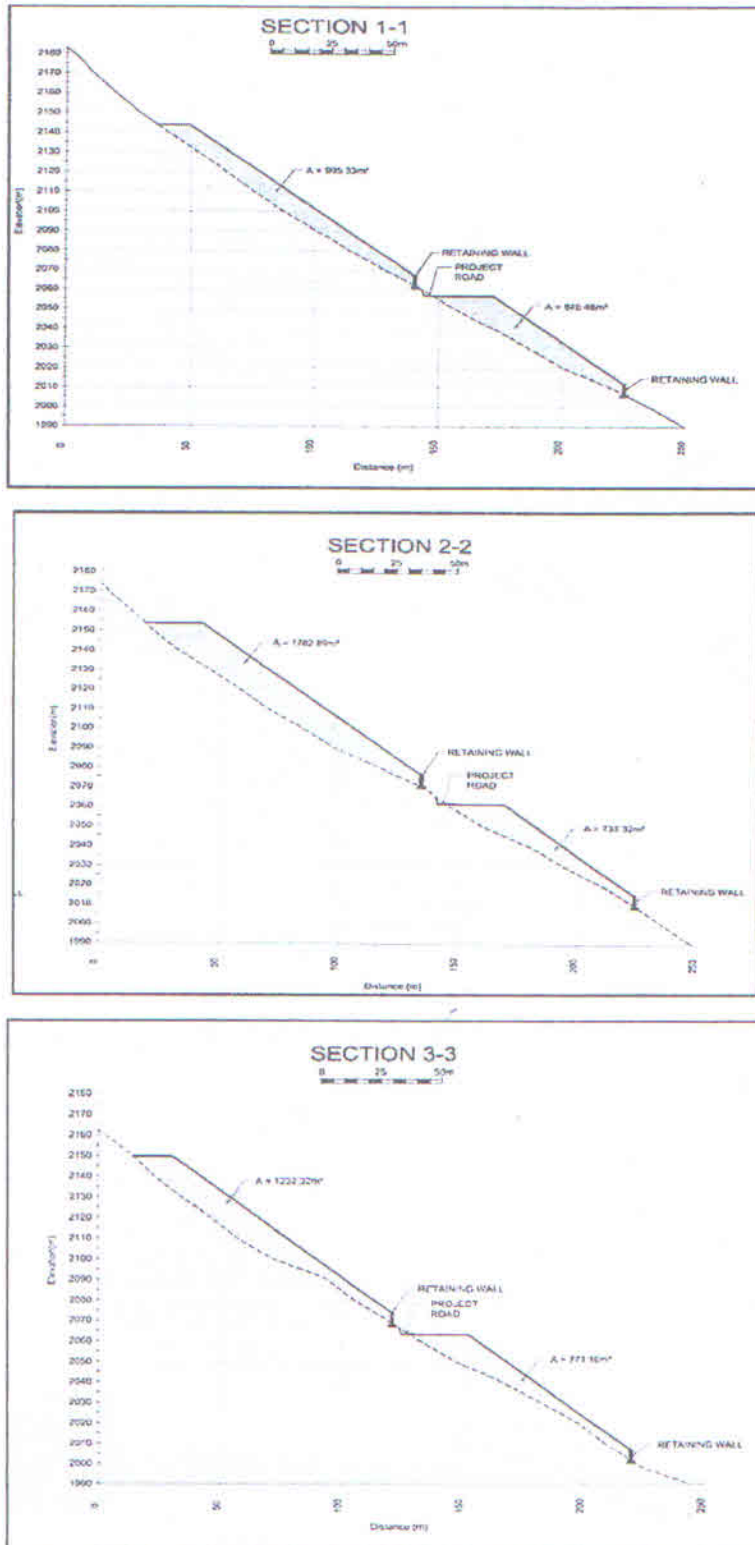


Figure 10.11: Sections of muck disposal area

Signature
 General Manager
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 NHPC Ltd., Mandi (H.P.)-175121

10.2.5.3.1 Transportation of Muck

The generated muck will be carried in dumper trucks covered with heavy-duty tarpaulin properly tied to the vehicle in line with international best practices. All precautionary measures will be followed during the dumping of muck. All dumpers will be well maintained to avoid any chances of loose material/soil falling during the transportation. All routes will be periodically wetted with the help of sprinklers before the movement of dump trucks. Dumping would be avoided during the high-speed wind, so that suspended particulate matter (PM₁₀ and PM_{2.5}) levels could be kept under check. For this SPM levels need to be monitored during transportation. Further, dumping will be avoided if there is heavy traffic in the area. After the dumping, the surface of dumps will be sprayed with water with the help of sprinklers and then compacted.

The cycle time of 20T Rear Dumpers for loading and transportation of muck is given below.

Cycle time of 20 T Rear Dumper is as follows:

Activity	Time taken (min.)
Spotting time	1.0
Loading time	6.7
Transportation @ 20 kmph for 3.5 km	10.5
Unloading	1.0
Return @ 25 kmph	8.4
Total	27.6

Based upon the varying cycle time of 20T Rear Dumpers at different excavation sites and their distance from the disposal site appropriate pollution management will be devised. The Standard practices of pollution abatement and control will be enforced through the contractor.

For 716676 m³ of muck, about 72000 truck trips will be required for muck transportation from point of generation to disposal site. This will be done over a period of 4 years; therefore for 300 working days per annum, about 60 trips per day will be required for disposal of muck.

10.2.5.3.2 Retaining Walls/ Stone Filled Wire Crates

Suitable retaining walls shall be constructed prior to dumping of muck, and terraces would be developed to support the muck on a vertical slope and for optimum space utilization. Loose muck would be compacted layer-wise. The muck disposal area will be developed in a series of terraces with retention walls. The terraces of the muck disposal area will be ultimately covered with fertile soil, and suitable plant species will be planted adopting suitable biotechnological measures.

For stacking of dumped material, concrete reinforced retaining walls are proposed to be built before dumping any material onto the sites (refer to **Figure 10.10**). In addition, leveling would

also be done after dumping the material on every cycle and simultaneously improving the drainage of the disposal site.

All the approach roads from various project excavation sites to the dumping site will be constructed by employing the methodology recommended by Border Roads with minimal environmental damage. The methodology consists in developing the formation width is half cutting and half-filling, so that the materials obtained from cutting are utilised in filling. The excavation on the hillside will be done to get a stable slope for the materials encountered. At places breast wall, gabion walls shall be done in natural slope to retain filled material, particularly where there is the problem of retaining the hill slope.

A retaining wall and gabion structure shall be constructed to retain filled material. To minimize the environmental damage, construction materials like stones, sand, etc., required for the construction of the road will be obtained mostly from the excavated material. In the streams, box culverts will be provided to prevent the erosion of the Nala bed. In addition, stone/concrete work on the downstream area will also be provided at vulnerable places to minimize erosion. Catch water drains will be provided for slope stabilization and evacuation of runoff.

The total area for the dumping of muck is **8.58 ha** which can accommodate more than **8.75 lakh cum** though the estimated muck to be disposed of is **7.17 lakh cum**. At least two retaining walls are required to be built to accommodate the muck as a road traverse through the middle of the proposed dumping site. These retaining walls are proposed to be located at about 30.0m distance from the highest flood level. The total length of retaining walls proposed to be constructed along the river would be more than 1000 running meters. The height of these retaining walls including Mechanically Stabilized Earth (MSE) wall panels will be approximately 10 m.

The retaining wall shall comprise 100 m thick PCC M10 base, RR Masonry blocks embedded in cement concrete (M10), and pressure relief holes at an angle of 50 for 1000 cc of discharge/drain holes of 50 cm provided for drainage.

10.2.5.3.3 Compaction

Compaction is an engineering measure, which would reduce bulk density of the muck thereby optimizing the use of muck disposal area and would make it suitable for the plantation and other biological measures. The top surface would be leveled and graded to make the alternative use. The muck will be spread in layers of 500-700 mm thick layers. The top surface would be leveled and graded to make the alternative use. On top, a layer of soil would be spread to make the land suitable for plantation. The total cost for the process of compaction is **Rs. 50.00 lakh**.

The total financial outlay for the retaining walls and compaction is **Rs.605.27 lakh**, and the breakup is given in **Table 10.20**.


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debris, reinforcing soil, and increasing the infiltration capacity of the area. The area shall be maintained for a period of three years after plantation for ensuring survival of saplings. The estimated cost of biological measures is given in **Table 10.21**.

Table 10.21: Estimated Cost of biological measures


S. No.	Particulars	Quantity	Rate (in Rs.)	Amount (Rs. in lakh)
1	Rolling of Muck	Lump-sum		40.00
2	Pitting (size: 0.45 m x 0.45 m x 0.45 m)	8,500 pits	35.00/pit	2.98
3	Manure and soil filling in pits	8,500 pits	5.00/pit	0.42
4	Raising of plants (including nursery cost, manure, transport, etc.)	8,500 pits	25.00/plant	2.13
5	Fencing, maintenance, watering, transport, etc.	Lump-sum		20.00
	Total			65.53

10.2.5.4 Financial Outlay

The estimated cost of the muck management plan is **Rs. 670.80 lakh** (see **Table 10.22**).

Table 10.22: Financial outlay for the muck management plan

S. No.	Particulars	Amount (Rs. in lakh)
1	Engineering measures	605.27
2	Biological measures	65.53
	Total	670.80


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