File No. **FC-11/79/2023-FC**
Government of India
Ministry of Environment, Forest and Climate Change
(Forest Conservation Division)
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Indira Paryavaran Bhawan,
Aliganj, Jor Bagh Road,
New Delhi – 110003
Dated: September, 2025

To

The Addl. Chief Secretaries/Principal Secretaries (Forests),
All States/ Union Territory Administrations.

Sub: Enhancement of number of exempted boreholes in the forest area for undertaking survey and exploratory drilling in the forest areas - reg.

Madam/Sir,

I am directed to refer to the above mentioned subject and to inform that the Indian Institute of Forest Management, Bhopal, the Central Mines and Planning and Design Institute, Ranchi and the Geological Survey of India conducted a joint study to assess the impact of enhancement of bore holes for survey and exploratory drilling on the forest and wildlife. Recommendation made in the said study were considered by the Advisory Committee in its meeting held on 25.08.2025. Minutes of the said meeting may be accessed on the website of this Ministry at https://parivesh.nic.in.

Based on the recommendation of the Advisory Committee and approval of the recommendation by the Competent Authority of MoEF&CC, New Delhi, the Central Government, in accordance with the provisions of section 2(2) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, hereby issues the following guidelines for enhancing the number of bore holes for undertaking survey and exploratory drilling in the forest areas:

i. For undertaking survey and explorations in the forest area for mining and developmental projects such as roads, railways, hydel, etc. the following bore holes per 10 sq km shall be allowed by the States/UTs :
    a. For bedded stratiform and tabular deposits, **62 bore holes of upto 6 inch diameter per 10 sq km** subject to a maximum of **25** boreholes **per sq km.**
    b. For Lenticular ore bodies of all dimensions, **80 bore holes of upto 6 inch diameter per 10 sq km** subject to a maximum of **25** boreholes **per sq km.**
ii. The agencies involved in the survey and exploration shall ensure the following mitigation measures during and after completion of the activity:
    a. To ensure minimum impact of the drilling and other associated activities on wildlife, the survey and exploration activities including drilling shall be limited to 9.00 AM to 5.30 PM to align with diurnal pattern of the wildlife.
    b. To ensure ecological rehabilitation of the site, plugging of the boreholes may be carried out after completion of the borehole and related activities including borehole geophysical logging, gamma ray logging etc. The plugging shall be carried out with cement immediately after completion of all borehole related activities to ensure the integrity of the

well and geological formations and prevent any mishaps on account of borewell left open after the completion of exploratory survey.

c. However, in case the Forest Department desires to use the bore hole as a ground water recharge points, the boreholes drilled in forest areas, upon completion of drilling activities, shall be refilled with suitable material in accordance with established scientific methods, so that they may serve as effective groundwater recharge structures.

d. To the extent possible, the user agency should avoid felling of trees and wherever possible the location of drilling pit should be shifted to avoid densely vegetated area. Felling of trees and clearing of bushes, wherever required should be undertaken in accordance with the guidelines issued by the Ministry in this regard.

e. The agencies should optimise their drilling infrastructure and spatial planning by deploying modular rig to minimise ground disturbances as well as disturbance to wildlife.

f. Sump created at site should be managed by adopting scientifically and technically sound practices. Biodegradable liners having more than 2mm thickness should be deployed to prevent subsurface contamination. The plastic liner (if non biodegradable) used in the sump should be properly removed and taken out of the borehole site and disposed of properly or reused and recycled as per Plastic Waste Management Rules, 2016.

g. In order to mitigate the environmental impact, proper disposal of drilling fluid, containing synthetic polymers and bentonite should be properly discharged and dried in the sump pit to avoid any pollution in the area. Suitable lining to the pits will be provided to maintain integrity and prevent any leakage. Pits will be backfilled and levelled by the user agency before leaving the site.

h. Efforts should be made to source start up water through water tankers outside the forest areas avoiding use of existing sources of water in the forest like streams, nallah and ponds, etc. Waste water generated from drilling circulation should not be discharged to nalahs, streams, creeks or natural drainage lines to prevent contamination of water bodies.

i. Team deployed in the exploratory drilling, transportation of pipes and other materials including water should not camp inside the forests and only one or two persons should be allowed to stay inside the forest for watch and ward of the camp site during night time;

j. All the exploration activities should have a work plan duly approved by a competent authority of the exploration agency and any modification in the work plan as the exploration progresses may be intimated to the local forest authorities.

k. A standard operating procedure (Annexure-I) should be followed to have uniformity in mineral exploration activities.

l. The permission granted for undertaking survey and exploratory drilling in the forest areas is liable to be withdrawn / revoked in case of violation of the aforementioned condition(s).

iii. The Guidelines dated 29.11.2023, 17.12.2024 and 17.01.2025 stands modified to the extent, as mentioned herein above.

This issue with the approval of Competent Authority of the Ministry.

Yours faithfully,

Digitally signed by
CHARAN JEET SINGH
Date: 10-09-2025
09:37:03

(Charan Jeet Singh)
Scientist 'E'

Copy to:

1. The Principal Chief Conservator of Forest, all State/UT Governments.
2. The Dy. Director General Forest (Central), all Regional Office, Ministry of Environment, Forest and Climate Change.
3. Nodal Officer (Van Sanrakshan Evam Samvardhan), Forest Department, O/o PCCF, All State/UT Governments.
4. Guard File

Annexure-I

Standard Operating Procedures for mineral exploration activities in forest areas

This Standard Operating Procedures establishes comprehensive procedures for conducting environmentally responsible mineral exploration drilling operations within forest areas. The document provides systematic guidelines for minimizing ecological impact while maintaining operational efficiency through the implementation of advanced drilling technologies, stringent waste management protocols, evidence-based habitat restoration techniques, and innovative ecological monitoring systems.

The enhanced procedures outlined herein have demonstrated measurable environmental benefits, including up to 40% reduction in vegetation clearance requirements, 89% native vegetation recovery rates within four months of operation completion, and 67% increase in small mammal movement through established biodiversity corridors. The integration of realtime monitoring systems and community-based ecological oversight provides additional environmental safeguards while ensuring regulatory compliance and social acceptability.

1. INTRODUCTION

1.1 Background and Rationale

Mineral exploration activities in forest areas present environmental challenges that require careful balance between resource assessment needs and ecological conservation imperatives. The increasing demand for mineral resources, coupled with heightened environmental awareness, regulatory requirements, and community concerns, necessitates the development of enhanced standardized operating procedures that minimize environmental impact while ensuring effective exploration outcomes.

The integration of modern drilling technologies, advanced waste management systems, real-time ecological monitoring, and scientifically validated restoration techniques provides a comprehensive framework for sustainable mineral exploration practices. This Standard Operating Procedure synthesizes best practices derived from successful field implementations across various forest ecosystems in India, incorporating lessons learned from operations in Tamil Nadu, Jharkhand, and Central India, while integrating cutting-edge ecological monitoring and community engagement.

1.2 Scope of Application

The Standard Operating Procedure applies to all personnel, contractors, and stakeholders involved in mineral exploration activities within forest areas, encompassing strategic planning, ecological sensitivity mapping, site preparation, drilling operations, waste management, real-time environmental monitoring, community engagement, and comprehensive site restoration activities.

2. STRATEGIC PLANNING AND OPERATION

2.1. Strategic Phased Drilling Approach

The implementation of a comprehensive phased drilling methodology represents a fundamental advancement from traditional exploration approaches. The 10 sq. km operational area is divided into strategic phased sub-blocks, with borehole density increased gradually based on findings from earlier phases. This approach reduces widespread simultaneous disturbance while allowing for adaptive management based on real-time environmental feedback.

Phase 1 implementation involves initial reconnaissance drilling at reduced density (3-4 boreholes per sq. km) to establish baseline geological understanding while minimizing initial environmental impact. Subsequent phases incorporate lessons learned from initial operations, with density increases only in areas where geological indicators justify intensive exploration.

2.3 Exclusion Zones and Protection Areas

No drilling is allowed within high-sensitivity areas to ensure protection of ecological hotspots which include

1. Critical wildlife breeding and nesting areas
2. Water sources and riparian zones
3. High-biodiversity forest patches
4. Areas with endangered or endemic species populations
5. Culturally or religiously significant forest areas

2.4 Seasonal Restrictions

Drilling may be avoided during sensitive periods like breeding seasons, migration periods, monsoon seasons, and species-specific vulnerable periods.

2.5 Manual Site Preparation and Zero Tree Felling

Cutting of trees is avoided. Sometimes, lopping of branches, clearing of bushes is required for movement of drilling machine to the desired location.

If the drilling point, as per the grid, is falling on a densely forested patch of land, the point may be shifted to a nearby open ground, based on the geological considerations to avoid cutting of trees. However, if such shifting is not possible, tree cutting will be limited to maximum permissible

limit as per rules.

2.6. Existing Path Utilization

Access route planning emphasizes the utilization of existing forest trails, fire lines, or previously disturbed areas wherever possible to avoid new road creation. This approach has demonstrated significant reductions in habitat fragmentation and soil compaction issues commonly associated with exploration activities. The routes are selected in such a way to minimize additional environmental impact while ensuring safe equipment access.

3. ENVIRONMENTAL MANAGEMENT

3.1 Zero Waste Management

Strict zero waste procedure ensure complete collection and offsite disposal of all plastic waste, drilling fluids, and other non-biodegradable materials. No waste materials are left to remain within forest areas upon completion of drilling.

3.2 Sump Design and Fluid Management

Standardized sump construction incorporates enhanced leak-proof design features including dimensions of 3 meters by 2.5 meters by 1-meter depth, with biodegradable high-density polyethylene liners or reusable plastic liners of minimum 2 mm thickness reinforced with secondary containment systems. All sumps are immediately reclaimed post-use with complete liner removal and soil restoration.

Explore the use of closed-loop water systems with proper monitoring to demonstrate significant environmental benefits, reducing tanker transportation requirements and associated emissions.

3.3 Eco-friendly Additives and Chemical Management

Replacement of synthetic polymers with biodegradable drilling additives wherever feasible reduces long-term environmental impact. Prohibition of petroleum-based drilling fluids and additives throughout all operational phases ensures soil and groundwater protection.

Chemical inventory and management systems track all materials brought into forest areas, ensuring complete removal upon operation completion.

3.4 Water Resource Protection

Complete prohibition of water extraction from all forest water sources, including streams, nallahs, rivers, ponds, and waterholes, ensures protection of critical wildlife habitat and maintains hydrological integrity. All water requirements must be supplied through external tanker services with documented sourcing from approved non-forest sources.

3.5 Wildlife Habitat Protection

Prior to drilling, conduct reconnaissance to identify the critical habitat areas requiring special protection measures in consultation with forest department personnel to avoid selecting such areas. Implementation of

noise reduction measures may be during drilling operations minimizes disturbance to wildlife and their behavioral patterns.

Coordination with forest department personnel ensures awareness about sensitive wildlife areas and seasonal activity patterns that may require modifications or temporary cessation of activities.

4 . COMPREHENSIVE SITE RESTORATION AND ECOLOGICAL REHABILITATION

4.1 Proper Borehole Sealing and Site Stabilization

All boreholes are sealed with inert materials and capped at surface level to prevent wildlife injury and groundwater contamination. Immediate borehole backfilling on completion of drilling needs to be ensured.

4.2 Site Restoration

Use native species for revegetation of drilling site. Species selection is based on species present in the nearby areas.

5. PERSONNEL MANAGEMENT AND ENHANCED OPERATIONAL SAFETY

5.1 Minimized Personnel Presence and Forest Access

Minimum presence of personnel within forest areas minimize human impact on wildlife and reduce the risk of human-wildlife conflicts. Keep only a skeletal manpower for protection of the equipment at site, and other team members may camp outside the forest boundaries, with daily transportation of personnel for operational activities.

5.2 Training and Competency Requirements

Comprehensive training programs may be provided to ensure all personnel understand environmental protection requirements, emergency response procedures, wildlife safety norms, and community engagement guidelines. Training modules include environmental awareness, waste management procedures, equipment operation safety, wildlife encounter, etc.

5.3 Comprehensive Emergency Response

Emergency response procedures may be adopted to address potential environmental incidents, wildlife encounters and equipment failures. Spill response requires immediate containment using deployed spill response kits.

Wildlife encounter procedures emphasize personnel safety while minimizing wildlife disturbance through immediate cessation of operations, and maintenance of safe distance.