

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH , NEW DELHI
ORIGINAL APPLICATION NO. 661OF 2024**

**IN THE MATTER OF:
TAMILNADU FLY ASH BRICKS AND BLOCKS MANUFACTURERS
ASSOCIATION**

.....APPLICANT

VS.

UNION OF INDIA & ORS.

.....RESPONDENT(S)

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Place: New Delhi

Date: 14-01-2025

Filed By:

(BIHU SHARMA)

Advocate for Respondent No.1
D-85 (LGF)
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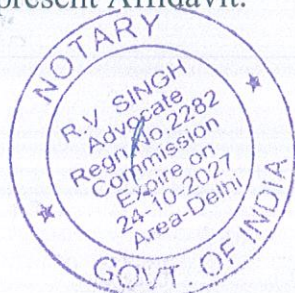
**COUNTER AFFIDAVIT ON BEHALF OF MINISTRY OF
ENVIRONMENT, FOREST & CLIMATE CHANGE i.e., RESPONDENT
NO.1**

MOST RESPECTFULLY SHOWETH:

I, Nallamulu Subrahmanyam of aged about 38 years, S/o Shri Narasimha Rao currently working as Scientist- 'E' in the Ministry of Environment, Forest & Climate Change, having office at Jor Bagh, New Delhi-110003 do hereby solemnly affirm and state as under:

1. That I am duly authorized and competent to swear the present reply affidavit on behalf of Ministry of Environment, Forest & Climate Change and well conversant with the facts and circumstances of the present case and thus competent to swear the present Affidavit.

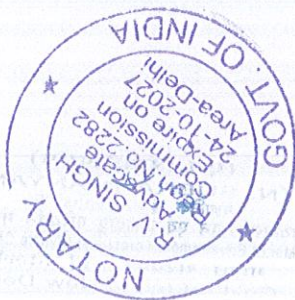
N. Subrahmanyam



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2. It is submitted at the very outset that the Respondent No. 1 denies each averment and/or submission made in the petition which is contrary to and inconsistent with the averments made and facts stated in the present reply. It is submitted that the nothing stated in the petition may be deemed to have been admitted by the Respondent No. 1 unless and until the same is explicitly admitted in the present affidavit.

3. That the Answering Respondent, has published the Notification on Utilization of ash from coal and lignite based Thermal Power Plants (hereinafter referred to as TPPs) *vide* S.O. 5481(E) dated 31.12.2021 to achieve 100% utilization by coal and lignite based TPPs. This notification supersedes the Fly ash notification, 1999 S.O. 763(E) dated 14.09.1999 and the subsequent amendments thereof. Copy of the Notification is annexed herein as **ANNEXURE R1/I**. The Notification S.O. 5481 (E) dated 31.12.2021, has been further amended *vide* S.O. 6169 (E) dated 30.12.2022. Copy of the Notification S.O. 6169 (E) dated 30.12.2022 is annexed herein as **ANNEXURE R1/II**.



N. Subrahmanyam

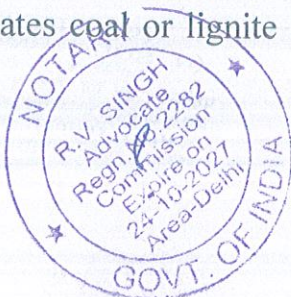
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4. It is respectfully submitted that the Ash Utilisation Notification 2021 (hereinafter referred to as 'the Notification'), vests the primary responsibility on the coal and lignite based TPPs to achieve 100% utilization of ash through prescribed eco-friendly purposes and in accordance with prescribed timelines.

5. That, clause (2) of Para A of the Notification, prescribes the following eco-friendly purposes for utilization of ash by TPPs, including utilization of fly ash in ash based products;

- i. Fly ash based products viz. bricks, blocks, tiles, fibre cement sheets, pipes, boards, panels;
- ii. Cement manufacturing, ready mix concrete;
- iii. Construction of road and fly over embankment, Ash and Geo-polymer based construction material;
- iv. Construction of dam;
- v. Filling up of low lying area;
- vi. Filling of mine voids;
- vii. Manufacturing of sintered or cold bonded ash aggregate;
- viii. Agriculture in a controlled manner based on soil testing;
- ix. Construction of shoreline protection structures in coastal districts
- x. Export of ash to other countries;
- xi. Any other eco-friendly purpose as notified from time to time.

6. It is humbly submitted that, clause (4) of Para A of the Notification mandates coal or lignite based TPPs for 100 % utilization of ash in a prescribed



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compliance cycle of three to five years. The relevant clause (4) of Para A is quoted herein below:

“(4) Every coal or lignite based thermal power plant shall be responsible to utilise 100 per cent ash (fly ash and bottom ash) generated during that year, however, in no case shall utilisation fall below 80 per cent in any year, and the thermal power plant shall achieve average ash utilisation of 100 per cent in a three years cycle:

Provided that the three years cycle applicable for the first time is extendable by one year for the thermal power plants where ash utilisation is in the range of 60-80 per cent, and two years where ash utilisation is below 60 per cent and for the purpose of calculation of percentage of ash utilisation, the percentage quantity of utilisation in the year 2021- 2022 shall be taken into account as per the table below:

Utilisation percentages of thermal power plants	First compliance Cycle to meet 100 per cent utilisation	Second compliance cycle onwards, to meet 100 per cent utilisation
>80 per cent	3 years	3 years
60-80 per cent	4 years	3 years
<60 per cent	5 years	3 years

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Provided further that the minimum utilisation percentage of 80 per cent shall not be applicable to the first year and first two years of the first compliance cycle for the thermal power plants under the utilization category of 60-80 per cent and <60 per cent, respectively.

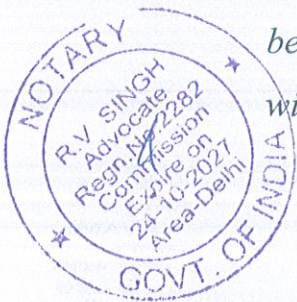
Provided also that 20per cent of ash generated in the final year of compliance cycle may be carried forward to the next cycle which shall be utilised in the next three years cycle along with the ash generated during that cycle.

Provided also that new thermal power plants commissioned on or after the date of publication of this notification shall follow the first compliance cycle similar to the compliance cycle specified for thermal power plants having utilisation per cent. less than 60 per cent. as specified in the table.

Note: The utilisation targets as per the applicable compliance cycle shall commence from 1st April, 2022.”

7. It is humbly submitted that, as per clause (6) of Para A of the Notification, in order to allow TPPs for temporary storage of ash, operation of two to four ash ponds have been permitted to TPPs. However, the ash stored in the ash ponds is to be utilized as per prescribed timelines provided in the notification. The relevant clause (6) of Para A is quoted herein below:

“(6) Any new as well as operational thermal power plant may be permitted operational ash pond or dyke for temporary storage of ash within an area of 0.1 hectare per Mega Watt (MW). Technical



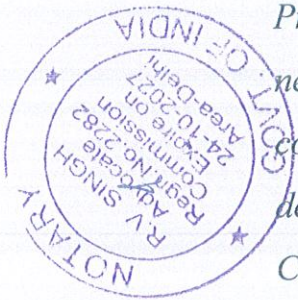
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specifications of operational as well as stabilised and reclaimed ash ponds or dykes shall be as per the guidelines of the Central Pollution Control Board (CPCB) made in consultation with the Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the operational as well as stabilised and reclaimed ash pond or dyke on its safety, environment pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt, etc. and shall be put in place within three months from the date of publication of this notification:

Provided that up to two operational ash ponds or dykes for thermal power plants commissioned before 31st December, 2021, having installed capacity less than or equal to 1600 MW, and up to four operational ash ponds or dykes for thermal power plants having installed capacity more than 1600 MW, having multiple lagoons, within the specified area from the existing ash ponds or dykes, may be designated with clear demarcation along with coordinates, and shall inform to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 31st March, 2023:

Provided further that one ash pond or dyke shall be permitted in case of new thermal power plants or expansion of existing thermal power plants commissioned on or after 31st December, 2021, which shall inform the details of demarcation along with coordinates to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board



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(SPCB) or Pollution Control Committee (PCC) within 3 months from the date of commissioning of thermal power plant or by 31st March, 2023, whichever is later:

Provided also that coal and lignite based thermal power plants shall not be allowed to further establish or designate any new operational ash pond or dyke:

Provided also that specification of 0.1 hectare per Mega Watt (MW) of an operational ash pond or dyke shall not be applicable for the thermal power plants commissioned before 03rd November, 2009."

8. It is humbly submitted that, Central Pollution Control Board (hereinafter referred to as 'CPCB'), has issued Guidelines on Design, Construction, O&M and Annual Certification of Coal Ash Ponds. The copy of the guidelines is attached as **Annexure-R1/III.**

9. It is humbly submitted that, as per clause (1) of Para C of the Notification, in case of non-utilization of ash, Environment Compensation is imposed on TPPs.

The relevant clause (1) Para C is quoted herein below:



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“(1) In the first two years of a three years cycle, if the coal or lignite based thermal power plant (including captive or co-generating stations or both) has not achieved at least 80 per cent ash (fly ash and bottom ash) utilisation, then such non-compliant thermal power plants shall be imposed with an environmental compensation of Rs. 1000 per ton on unutilised ash during the end of financial year based on the annual reports submitted and if it is unable to utilise 100 per cent of ash in the third year of the three years cycle, it shall be liable to pay an environmental compensation of Rs. 1000 per ton on the unutilised quantity on which environmental compensation has not been imposed earlier:

Provided that the environmental compensation shall be estimated and imposed at the end of last year of the first compliance cycle as per the various utilisation categories as mentioned in sub-paragraph (4) of Para A.”

10. It is humbly submitted that, as per clause (1) of Para E of the Notification, CPCB, State Pollution Control Boards (hereinafter referred to as ‘SPCB’) or Pollution Control Committee (hereinafter referred to as ‘PCC’) shall be enforcing and monitoring authority for ensuring compliance of the provisions of the notification. The relevant clause (1) of Para E is quoted herein below:

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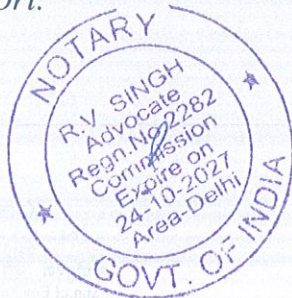
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“(1) The Central Pollution Control Board (CPCB) and the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be the enforcing and monitoring authority for ensuring compliance of the provisions and shall monitor the utilisation of ash on quarterly basis. Central Pollution Control Board shall develop a portal for the purpose within six months of date of publication of the notification. The concerned District Magistrate shall have concurrent jurisdiction for enforcement and monitoring of the provisions of this notification.”

11. It is humbly submitted that, as per clause (5) of Para E of the Notification, a compliance audit for ash disposal by TPPs and the user agency is mandated. The relevant clause (5) of Para E is quoted herein below:

“(5) The compliance audit for ash disposal by the thermal power plants and the user agency shall be conducted by auditors, authorised by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report.”



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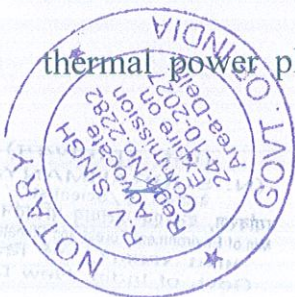
12. It is humbly submitted, that Central Pollution Control Board vide Office Memorandum dated 09.09.2024 has authorized auditors to undertake the compliance audit for ash disposal by the coal or lignite based TPPs. The copy of the Office Memorandum dated 09.09.2024, is attached as **Annexure-R1/IV**.

13. It is humbly submitted that, the Notification, S.O. 5481 (E) dated 31.12.2021, has been further amended *vide* S.O. 05 (E) dated 01.01.2024, on requests received from the Ministry of Power and other stakeholders regarding the implementation of the provisions outlined in the notification. That it was expedient to amend certain provisions of the said notification to promote use of ash for eco-friendly purposes, including use of ash in ash-based products manufactured by micro and small enterprises engaged in ash-based product manufacturing. Copy of the Notification S.O. 05 (E) dated 01.01.2024 is annexed herein as **ANNEXURE R1/V**.

14. It is humbly submitted that, in order to encourage use of ash in ash based products, all building construction projects located within 300 km radius of thermal power plants have been mandated to use ash bricks, tiled, sintered ash

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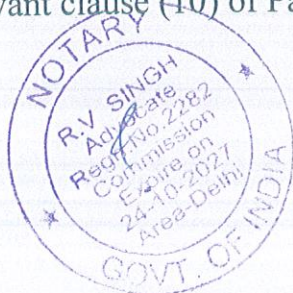


aggregate or other ash based products. The relevant clause (8) Para B is quoted herein below:

“All building construction projects (Central, State and Local authorities, Govt. undertakings, other Govt. agencies and all private agencies) located within a radius of 300 kms from a coal or lignite based thermal power plant shall use ash bricks, tiles, sintered ash aggregate or other ash based products, provided these are made available at prices not more than the price mentioned in the Schedule of Rates as specified by the Central Public Works Department (CPWD) or Public Works Department (PWD) of the State concerned or price of alternative products, if not mentioned in the Schedule of Rates.

That the Central Public Works Department and Public Works Department of the State concerned shall publish the Schedule of Rates specified within six months from the 1st January, 2024.”

15. It is humbly submitted that, as per clause (10) of Para B of the Notification, local authorities are required to make provisions, in their respective, building bye-laws and other relevant regulations to use ash and ash based products in construction of buildings, roads, embankments or for any other related construction activity. The relevant clause (10) of Para B is quoted herein below:



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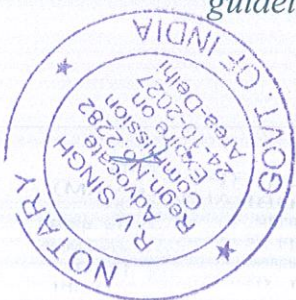
“(10) All local authorities shall make provisions in their respective building bye-laws and other relevant regulations for the use of ash and ash-based products, such as bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre cement sheets, pipes, boards, panels in construction of buildings, roads, embankments or for any other related construction activity.”

16. It is humbly submitted that, Para D clause (4) of the Notification, mandates coal or lignite based thermal power plants to reserve certain percentage of ash for supply to all micro and small enterprises engaged in ash based product manufacturing namely, bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre cement sheets, pipes, boards, panels. The relevant para has been reproduced herein below:

“(4) The coal or lignite based thermal power plants, while utilising ash under this notification shall reserve certain percentage of ash for supply to all micro and small enterprises engaged in ash-based product manufacturing namely, bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre cement sheets, pipes, boards, panels for sale at concessional price or through limited auction in accordance with the guidelines issued by the Central Government in the Ministry of Power.”

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17. It is further submitted that, in compliance to the directions dt. 18.01.2022 passed by the Hon'ble National Green Tribunal in OA no. 164 of 2018 titled as Ashwani Kumar Dubey vs. UOI & Ors, the Fly Ash Management and Utilization Mission was constituted vide MoEF&CC order dt. 09.03.2022. The Mission held its first meeting on 24.11.2022. Thereafter, various meetings were convened on 31.01.2023, 01.05.2023 and 04.07.2023, 19.10.2023 and 31.01.2024, 26.06.2024 and 23.12.2024, respectively. The minutes of aforesaid meetings held by the Mission are uploaded on the website of the Ministry and the copies of the same are hereby enclosed as **Annexure – R-1/VI (colly)**.

18. That in view of the above, it is most humbly prayed that this Hon'ble Tribunal may kindly pass such order(s) as may be deemed fit and proper in the facts and circumstances of the case.

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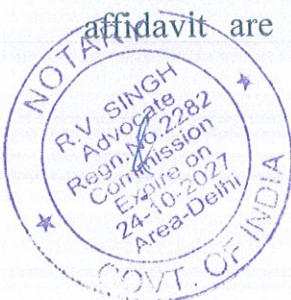
DEPONENT

VERIFICATION

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Verified at **13 JAN 2025** on this day of January, 2025 that the contents of the above

affidavit are true and correct to my knowledge and as per official records



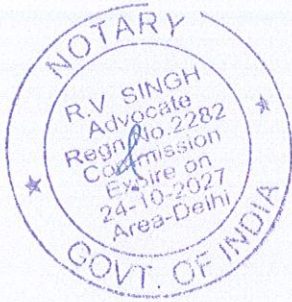
maintained in the routine course of business. No part of the above affidavit is false and no material has been concealed therefrom.

I Identified the deponent/executant who has signed in my presence

N. Subrahmanyam

DEPONENT

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solemnly affirmed before me, read over & explained to the deponent.

[Signature]
Notary Public, DELHI

13 JAN 2025

(पंजीकृत - 150)
(MAYRAH...)
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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

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NEW DELHI, FRIDAY, DECEMBER 31, 2021/PAUSHA 10, 1943

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 31 दिसम्बर, 2021

का.आ. 5481(अ).—केन्द्रीय सरकार ने भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना सं. का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 द्वारा कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से तीन सौ किलोमीटर के विनिर्दिष्ट व्यास के भीतर ईंटों के विनिर्माण के लिए उपजाऊ मिट्टी के उत्खनन को प्रतिबंधित करने के लिए और भवन निर्माण सामग्री के विनिर्माण में और संनिर्माण क्रियाकलाप में फ्लाई-राख के उपयोग को बढ़ावा देने के लिए निदेश जारी किए हैं;

और, प्रदूषणकर्ता भुगतान सिद्धांत (पीपीपी) के आधार पर, ऐसा करके कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों द्वारा फ्लाई-राख का 100 प्रतिशत उपयोग सुनिश्चित करते हुए और फ्लाई-राख प्रबंधन प्रणाली की संधारणीयता के लिए पूर्वोक्त अधिसूचना को और अधिक प्रभावकारी ढंग से कार्यान्वित करने हेतु, केंद्रीय सरकार ने मौजूदा अधिसूचना की समीक्षा की;

और प्रदूषणकर्ता भुगतान सिद्धांत के आधार पर पर्यावरणीय प्रतिकर निर्धारित किए जाने की आवश्यकता है;

और, विनिर्माण को बढ़ावा देकर तथा निर्माण कार्य के क्षेत्र में राख आधारित उत्पादों तथा भवन निर्माण सामग्रियों के प्रयोग को अनिवार्य करके उपजाऊ मिट्टी को संरक्षित करने की आवश्यकता है;

और, सड़क बनाने, सड़क एवं फ्लाई ओवर के रेलिंग बनाने, तटरेखा की सुरक्षा का उपाय करने, अनुमोदित परियोजनाओं के निचले क्षेत्रों को भरने, खनित स्थलों को फिर से भरने में मिट्टी की सामग्रियों से भरने के विकल्प के रूप में राख उपयोग को बढ़ावा देकर उपजाऊ मिट्टी और प्राकृतिक संसाधनों को संरक्षित करने की आवश्यकता है;

और, पर्यावरण को सुरक्षित करना तथा कोयला अथवा लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित फ्लाई राख के निक्षेपण तथा निपटान की रोकथाम करना आवश्यक है;

और, उक्त अधिसूचना में जो 'राख' शब्द का प्रयोग किया गया है उसमें कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित फ्लाई-राख और बॉटम-राख दोनों शामिल हैं;

और, केंद्रीय सरकार प्रदूषणकर्ता भुगतान सिद्धांत के आधार पर, पर्यावरणीय प्रतिकर की प्रणाली सहित राख के उपयोग के लिए एक व्यापक ढांचा लाना चाहती है;

अतः पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत सरकार के पर्यावरण एवं वन मंत्रालय की अधिसूचना जो का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 द्वारा भारत के राजपत्र, असाधारण भाग II, खंड 3, उप खंड (i) में प्रकाशित का अधिक्रमण करते हुए, कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों द्वारा राख के उपयोग के संबंध में प्रारूप अधिसूचना जो सा.का.नि. 285 (अ) तारीख 22 अप्रैल, 2021 द्वारा भारत के राजपत्र, असाधारण, भाग-2, धारा 3, उप धारा (i) में प्रकाशित की गई थी जिसमें उन सभी व्यक्तियों से जिनका इससे प्रभावित होना सामान्य है उस तारीख से, जिसको उक्त प्रारूप उपबंधों की शासकीय राजपत्र में अंतर्विष्ट प्रतियां जनता को उपलब्ध करा दी गई थी, साठ दिनों के अवसान से पूर्व आक्षेप और सुझाव आमंत्रित किए गए थे।

और उक्त प्रारूप अधिसूचना के संबंध में उससे संभावित तौर पर प्रभावित होने वाले सभी व्यक्तियों से प्राप्त आक्षेपों और सुझावों पर केंद्रीय सरकार द्वारा सम्यक रूप से विचार कर लिया गया है;

अतः पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए और अधिसूचना का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 का उन बातों के सिवाय अधिकृत करते हुए जिन्हें ऐसे अधिक्रमण से पूर्व किया गया है या करने का लोप किया गया है, केंद्रीय सरकार कोयलों या लिग्नाइट आधारित ताप विद्युत संयंत्रों से राख के उपयोग के संबंध में निम्नलिखित अधिसूचना जारी करती है, जो इस अधिसूचना के प्रकाशन की तिथि से प्रवृत्त होगी, अर्थात्

क. फ्लाई-राख और बॉटम-राख का निपटान करने हेतु ताप विद्युत संयंत्रों (टीपीपी) के उत्तरदायित्व.-

(1) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र (जिनमें कैप्टिव और/या सह-उत्पादन केंद्र शामिल हैं या दोनों) की यह प्राथमिक जिम्मेदारी होगी कि वह अपने द्वारा सृजित राख (फ्लाई-राख और बॉटम-राख) का उप पैरा (2) में दिए गए पारि-अनुकूल तरीके से 100 प्रतिशत उपयोग सुनिश्चित करे;

(2) कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित राख का उपयोग केवल निम्नलिखित पारि-अनुकूल प्रयोजनों के लिए किया जाएगा, अर्थात्:-

- (i) फ्लाई राख पर आधारित उत्पाद अर्थात्: ईट ब्लॉक टाइल, फाइबर सीमेंट शीट, पाइप, बोर्ड, पैनल का विनिर्माण;
- (ii) सीमेंट विनिर्माण, रेडी-मिक्स कंक्रीट;

- (iii) सड़क निर्माण और फ्लाई-ओवर के रेलिंग का निर्माण, राख और जिओ-पॉलीमर आधारित निर्माण सामग्री;
- (iv) बांध का निर्माण;
- (v) निचले क्षेत्र को भरना;
- (vi) खनन कार्य से रिक्त हुए स्थान को भरना;
- (vii) सिंटेड या शीत-बद्ध राख संचय का विनिर्माण;
- (viii) मृदा परीक्षण के आधार पर नियंत्रित तरीके से कृषि;
- (ix) तटीय जिलों में तटरेखा संरक्षण संरचनाओं का निर्माण;
- (x) अन्य देशों को राख का निर्यात;
- (xi) समय-समय पर यथाधिसूचित किसी अन्य पारि-अनुकूल प्रयोजन के लिए।
- (3) अध्यक्ष, केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति गठित की जाएगी जिसमें पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफसीसी), विद्युत मंत्रालय, खान मंत्रालय, कोयला मंत्रालय, सड़क परिवहन और राजमार्ग मंत्रालय, कृषि अनुसंधान एवं शिक्षा विभाग, सड़क कांग्रेस संस्थान तथा राष्ट्रीय सीमेंट एवं भवन सामग्री परिषद के प्रतिनिधियों को सदस्यों के रूप में शामिल किया जाएगा, जिसका प्रयोजन राख के उपयोग के पारि-अनुकूल तौर-तरीकों की जांच करना, उनकी समीक्षा एवं अनुशंसा करना तथा प्रौद्योगिकीय विकासों तथा पणधारी से प्राप्त अनुरोधों के आधार पर उप-पैरा (2) में यथोल्लिखित ऐसे तौर-तरीकों की सूची में समिति द्वारा सुझाए गए तौर-तरीकों को शामिल करना या किसी तौर-तरीके को सूची से हटाना या उसमें संशोधन करना है। जब भी इस प्रयोजन के लिए अपेक्षित हो, यह समिति राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति, ताप विद्युत संयंत्र और खानों के प्रचालकों को आमंत्रित कर सकती है। इस समिति सिफारिश के आधार पर, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय ऐसे पारि-अनुकूल प्रयोजन प्रकाशित करेगा।
- (4) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र उस वर्ष के दौरान सृजित राख (फ्लाई-राख और बॉटम-राख) का 100 प्रतिशत उपयोग करने हेतु उत्तरदायी होगा; तथापि, किसी भी स्थिति में, किसी वर्ष में राख का उपयोग 80 प्रतिशत से नीचे नहीं होगा और साथ ही, उस ताप विद्युत संयंत्र को तीन वर्ष की अवधि में 100 प्रतिशत औसत राख के उपयोग का लक्ष्य प्राप्त करना होगा :

परंतु, यह और कि पहली बार के लिए लागू तीन वर्ष के चक्र को ऐसे ताप विद्युत संयंत्रों, जहां राख का उपयोग 60-80 प्रतिशत के बीच होता है, एक वर्ष के लिए और ऐसे संयंत्रों, जहां राख का उपयोग 60 प्रतिशत से कम है, दो वर्ष के लिए बढ़ाया जा सकता है, और राख के उपयोग की प्रतिशतता की गणना के प्रयोजन के लिए वर्ष 2021-2022 में उपयोग की प्रतिशत प्रमात्रा को नीचे दी गई तालिका के अनुसार ध्यान में रखा जाएगा:

तापीय विद्युत संयंत्रों के उपयोग की प्रतिशतता	100 प्रतिशत उपयोगिता प्राप्त करने के लिए प्रथम अनुपालन चक्र	100 प्रतिशत उपयोगिता प्राप्त करने के लिए द्वितीय अनुपालन चक्र
>80 प्रतिशत	3 वर्ष	3 वर्ष
60-80 प्रतिशत	4 वर्ष	3 वर्ष
<60 प्रतिशत	5 वर्ष	3 वर्ष

परन्तु, ताप विद्युत संयंत्रों के लिए 80 प्रतिशत न्यूनतम उपयोग प्रतिशतता, क्रमशः 60-80 प्रतिशत और <60 प्रतिशत की उपयोगिता की श्रेणी के तहत आने वाले ताप विद्युत संयंत्रों के लिए प्रथम अनुपालन चक्र के पहले वर्ष और पहले दो वर्षों पर लागू नहीं होगी।

परन्तु, अनुपालन चक्र के अंतिम वर्ष में सृजित 20 प्रतिशत राख को अगले चक्र में भी ले जाया जाएगा जिसका उपयोग उस अनुपालन चक्र के दौरान सृजित राख के साथ अगले तीन वर्षों में किया जाएगा।

- (5) अप्रयुक्त संचित राख अर्थात् लीगेसी राख, जिसका इस अधिसूचना के प्रकाशन से पहले भंडारण किया गया है, को ताप विद्युत संयंत्र (टीपीपी) द्वारा इस रीति से क्रमिक रूप से उपयोग में लाया जाएगा, कि लीगेसी राख को इस अधिसूचना के प्रकाशन की तिथि से दस वर्षों के भीतर पूरी तरह उपयोग कर लिया जाएगा और यह उस विशिष्ट वर्ष के चालू संचालनों के माध्यम से राख उत्सर्जन के लिए निर्धारित उपयोग लक्ष्यों से अतिरिक्त होगा।

परन्तु, निम्नलिखित प्रतिशतताओं में यथा उल्लिखित लीगेसी राख की न्यूनतम मात्रा का उपयोग तास्थानी वर्ष के दौरान कर लिया जाएगा और लीगेसी राख की न्यूनतम मात्रा की ताप विद्युत संयंत्र की संस्थापित क्षमता के अनुसार वार्षिक राख उत्सर्जन के आधार पर की जानी है।

प्रकाशन की तिथि से वर्ष	पहला	दूसरा	तीसरा-दसवां
लीगेसी राख का उपयोग (वार्षिक राख की प्रतिशतता)	कम से कम 20 प्रतिशत	कम से कम 35 प्रतिशत	कम से कम 50 प्रतिशत

परन्तु, यह और कि लीगेसी राख का उपयोग वहां अपेक्षित नहीं है, जहां राख के तालाब या डाइक स्थिर हो गए हैं और हरित पट्टी के निर्माण या पौध रोपण से पुनरुद्धार किया गया है और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड इस संबंध में प्रमाणित करेगा। किसी राख तालाब या डाइक के स्थिरीकरण और भूमि-उद्धार का कार्य, जिसमें केन्द्रीय प्रदूषण नियंत्रण बोर्ड या राज्य प्रदूषण नियंत्रण बोर्ड द्वारा प्रमाणन शामिल है, इस अधिसूचना के प्रकाशन की तारीख से एक वर्ष के भीतर किया जाएगा। अन्य सभी राख के कुंड या डाइक में शेष बचे राख का उपयोग ऊपर उल्लिखित समय-सीमाओं के अनुसार क्रमिक रूप से किया जाएगा।

टिप्पण: राख के उपयोग के लक्ष्यों को हासिल करने के लिए उप पैरा (4) और (5) के अधीन दायित्व 01 अप्रैल, 2022 की तारीख से लागू होंगे।

- (6) किसी भी नए तापीय विद्युत संयंत्र (टीपीपी) में 0.1 हेक्टेयर प्रति मेगावाट (एमडब्ल्यू) क्षेत्रफल के साथ आपातकालीन या अस्थायी राख कुंड की अनुमति दी जा सकती है। राख के तालाब या डाइकों का तकनीकी विनिर्देश, केन्द्रीय विद्युत प्राधिकरण (सीईए) के परामर्श से केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा बनाए गए दिशानिर्देशों के अनुसार होगा और ये दिशानिर्देश राख के कुंड या डाइक के संबंध में इसकी सुरक्षा, पर्यावरणीय प्रदूषण, उपलब्ध प्रमात्रा, निपटान का तरीका, निपटान में जल की खपत या संरक्षण, राख जल पुनर्चक्रण और ग्रीन बेल्ट आदि के वार्षिक प्रमाणन के लिए कार्यविधि भी निर्धारित करेंगे और इस अधिसूचना के प्रकाशन की तारीख से तीन महीनों के भीतर प्रस्तुत किए जाएंगे।
- (7) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र यह सुनिश्चित करेगा कि राख की लदाई, उतराई, ढुलाई, भंडारण और निपटान पर्यावरणीय दृष्टि से अनुकूल रीति से किया गया है और वायु और जल प्रदूषण की रोकथाम के लिए सभी ऐहितयात किए गए हैं और इस संबंध में स्थिति की सूचना इस अधिसूचना में संलग्न अनुबंध में संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को दी जाएगी।
- (8) प्रत्येक कोयला या लिग्नाइट आधारित तापीय विद्युत संयंत्र, संस्थापित क्षमता पर आधारित राख के कम से कम 16 घंटों के भंडारण के लिए समर्पित शुष्क फ्लाई राख साइलोस प्रतिष्ठापित करेगा, जिनके पास पृथक पहुंच मार्ग होंगे, जिससे कि राख पहुंचाने के कार्य को सुगम बनाया जा सके। इसकी सूचना संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को उपाबंध में दी जाएगी और केन्द्रीय प्रदूषण नियंत्रण

बोर्ड (सीपीसीबी) या राज्य केन्द्रीय प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति द्वारा समय-समय पर निरीक्षण किया जाएगा।

- (9) प्रत्येक कोयला या लिग्नाईट आधारित तापीय विद्युत संयंत्र (जिसके अंतर्गत कैप्टिव या सह उत्पादन केन्द्र भी है या दोनों), वास्तविक उपयोगकर्ता (उपयोगकर्ताओं) के हित के लिए केन्द्रीय प्रदूषण नियंत्रण बोर्ड के वेब पोर्टल या मोबाईल फोन एप्प का लिंक उपलब्ध कराकर ताप विद्युत संयंत्र के पास राख की उपलब्धता के वास्तविक आंकड़े प्रदान करेगा।
- (10) राख के 100 प्रतिशत उपयोग का वैधानिक दायित्व, जहां भी लागू हो, विधि में बदलाव के रूप में माना जाएगा।

ख. राख के उपयोग के प्रयोजनार्थ, उत्तरवर्ती उप पैराग्राफ लागू होंगे :-

- (1) ऐसे सभी अभिकरण (सरकारी, अर्द्धसरकारी और निजी), जो सड़क बिछाने, सड़क और फ्लाई ओवर के किनारों, तटीय जिलों में तटरेखा की सुरक्षा संरचनाओं और लिग्नाईट या कोयला आधारित ताप विद्युत संयंत्र से 300 किमी के भीतर बांधों जैसे निर्माण संबंधी कार्यकलापों में लगे हुए हैं, इन कार्यकलापों में अनिवार्य रूप से राख का उपयोग करेंगे :

परंतु इसको परियोजना स्थल पर निशुल्क पहुंचाया जाए और परिवहन लागत, ऐसे कोयला या लिग्नाईट आधारित ताप विद्युत संयंत्रों द्वारा वहन की जाए।

परंतु यह और कि ताप विद्युत संयंत्र पारस्परिक सहमत हुई शर्तों के अनुसार राख की लागत और परिवहन के लिए शुल्क ले सकता है उस मामले में जहां ताप विद्युत संयंत्र अन्य माध्यम से राख का निपटान करने में समर्थ है और ये अभिकरण इसके लिए प्रार्थना कर सकते हैं और बिना लागत और बिना परिवहन शुल्क के राख उपलब्ध कराने के प्रावधान तभी लागू होंगे यदि उसके लिए ताप विद्युत संयंत्र उस निर्माण अभिकरण को नोटिस जारी करता है।

- (2) उक्त कार्यकलापों में राख का उपयोग भारतीय मानक ब्यूरो, भारतीय रोड कांग्रेस, केन्द्रीय भवन अनुसंधान संस्थान, रूडकी, केन्द्रीय सड़क अनुसंधान संस्थान, दिल्ली, केन्द्रीय लोक निर्माण विभाग, राज्य लोक निर्माण विभागों और अन्य केन्द्रीय और राज्य सरकार के अभिकरणों द्वारा निर्धारित किए गए विनिर्देशों और दिशानिर्देशों के अनुसार किया जाएगा।

- (3) तापीय विद्युत संयंत्र की 300 किलोमीटर की परिधि के भीतर अवस्थित सभी खानों के लिए विस्तारित उत्पादक उत्तरदायित्व (ईपीआर) के तहत खुली आवर्त खानों में राख का पृष्ठ भंडारण करना या अधिक भार के ढेरों के साथ राख का मिश्रण करना बाध्यकारी होगा। सभी खान के स्वामी या प्रचालक (चाहे सरकारी, सार्वजनिक और निजी क्षेत्र के हो) कोयला या लिग्नाईट आधारित तापीय विद्युत संयंत्रों से तीन सौ किलोमीटर (सड़क द्वारा) के भीतर, महानिदेशक, खान सुरक्षा (डीजीएमएस) के दिशानिर्देशों के अनुसार ओवर बर्डन के बाह्य निक्षेप खान की बैकफिलिंग अथवा स्टोर्विंग (प्रचालित या छोड़ी गई खानों, जैसा भी मामला हो) के लिए उपयोग की गई सामग्रियों के भार-दर-भार के आधार पर कम से कम 25 प्रतिशत राख को मिश्रित करने के लिए उपाय करेंगे :

परंतु ऐसे तापीय विद्युत केन्द्र निःशुल्क राख प्रदान करके और परिवहन की लागत को वहन करके या पारस्परिक सहमत हुई शर्तों पर लिए गए निर्णय के अनुसार लागत या परिवहन व्यवस्था करके राख की अपेक्षित मात्रा की उपलब्धता को सुकर बनायेंगे और खानों के खाली स्थानों और ढेरों में अधिकभार के साथ राख को मिश्रित करना, सृजित अधिभार के लिए इस अधिसूचना के प्रकाशन की तिथि से लागू होगा और उक्त कार्यकलापों में राख का उपयोग, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक खान सुरक्षा और भारतीय खदान ब्यूरो द्वारा निर्धारित दिशानिर्देशों के अनुसार किया जाएगा।

स्पष्टीकरण .- इस उप-पैरा के प्रयोजन के लिए यह भी स्पष्ट किया जाता है कि लागत मुक्त राख और निःशुल्क परिवहन के उपबंध केवल तभी लागू होंगे यदि ताप विद्युत संयंत्र इसके लिए खान मालिक को नोटिस देते हैं और अधिभार वाले ढेर के साथ मिश्रित करने और खान में खाली स्थान को भरने के लिए राख के 25 प्रतिशत हिस्से के उपयोग का अधिदेश तब तक लागू नहीं होगा जब तक कि ताप विद्युत संयंत्र द्वारा खान मालिक को नोटिस न दिया गया हो।

- (5) (i) सभी खान मालिकों को खान में खाली स्थानों में राख को समायोजित करने के लिए खान बंद योजना (प्रगामी और अंतिम) तैयार करनी होगी और खान में खाली स्थानों में राख के निपटान और अधिभार वाले ढेर के साथ राख को मिश्रित करने के लिए खान योजनाओं को संबंधित प्राधिकारी अनुमोदित करेगा। पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय द्वारा ताप विद्युत संयंत्रों और कोयला खदानों की पर्यावरणीय मंजूरी की अपेक्षा से छूट देने के साथ-साथ ऐसे निपटान के लिए अपनाए जाने वाले दिशानिर्देशों के संबंध में तारीख 28 अगस्त, 2019 को दिशानिर्देश जारी किए गए।
- (ii) मंत्रालय, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक, खान सुरक्षा (डीजीएमएस) और भारतीय खान ब्यूरो (आईबीएम) के साथ परामर्श करके, खानों में खाली स्थानों में राख के निपटान करने तथा अधिभार वाले ढेरों में इसे मिश्रित करना सुगम बनाने के लिए समय-समय पर आगे भी दिशानिर्देश जारी कर सकता है और यह खान मालिकों की जिम्मेदारी होगी कि वे ऐसी खानों को अभिज्ञात करने की तिथि से एक वर्ष के भीतर विभिन्न विनियामक प्राधिकरणों द्वारा जारी की गई अनुमतियों में आवश्यक संशोधन या परिवर्तन प्राप्त करेंगे।
- (6) (i) पर्यावरणीय प्रदूषण के संदर्भ में सुरक्षा, व्यवहार्यता (आर्थिक व्यवहार्यता नहीं) और पहलुओं की जांच सहित राख से खान में खाली स्थान को वापस भरने/अधिभार वाले ढेर के साथ राख को मिश्रित करने के लिए खानों की पहचान करने के लिए पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, विद्युत मंत्रालय, खान मंत्रालय, कोयला मंत्रालय, महानिदेशक खान सुरक्षा और भारतीय खान ब्यूरो से प्रतिनिधियों को शामिल करते हुए अध्यक्ष, केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति का गठन किया जाएगा और यह समिति पणधारी मंत्रालयों या विभागों के लिए अभिज्ञात खानों (भूमिगत और खुली, दोनों) के संबंध में तैयार की गई तिमाही रिपोर्टों को अद्यतन करेगी और यह समिति, इस अधिसूचना के प्रकाशन के तुरंत पश्चात उपयुक्त खानों की पहचान करना आरंभ करेगी।
- (ii) ताप विद्युत संयंत्र या खानें, उपरोक्त अनुसार अधिदेशित उपयोग लक्ष्यों को पूरा करने के लिए उपर्युक्त समिति द्वारा पहचान किए जाने तक राख के निपटान हेतु प्रतीक्षा नहीं करेंगी।
- (7) राख से निचले क्षेत्र को भरने का कार्य, अनुमोदित परियोजनाओं के लिए राज्य प्रदूषण नियंत्रण बोर्ड की पूर्व अनुमति से और केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्धारित दिशा-निर्देशों के अनुसार किया जाएगा और राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति द्वारा अनुमोदित स्थलों, अवस्थान, क्षेत्र और अनुमत मात्रा को अपनी वेबसाइट पर प्रतिवर्ष प्रकाशित किया जाएगा।
- (8) केन्द्रीय प्रदूषण नियंत्रण बोर्ड, संगत पणधारी के साथ मिलकर, राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा अनुमति प्रदान करने के लिए समयबद्ध ऑनलाइन आवेदन प्रक्रिया प्रस्तुत करने के साथ-साथ इस अधिसूचना के अधीन परिकल्पित सभी प्रकार के कार्यकलापों के लिए एक वर्ष के भीतर दिशानिर्देश प्रस्तुत करेगा।
- (9) कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र से तीन सौ किलोमीटर के दायरे में स्थित सभी भवन निर्माण परियोजनाएं (केंद्रीय, राज्य और स्थानीय प्राधिकरणों सरकारी उपक्रमों, अन्य सरकारी अभिकरणों तथा सभी निजी अभिकरणों) राख की ईटों, टाईल्स, धातुमल राख अथवा अन्य राख आधारित उत्पादों का उपयोग करेंगी बशर्ते कि वे वैकल्पिक उत्पादों की कीमत से अधिक कीमत पर उपलब्ध न हो।
- (10) राख आधारित उत्पादों के विनिर्माण और ऐसे उत्पादों में राख के उपयोग में भारतीय मानक ब्यूरो, भारतीय सड़क कांग्रेस और केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्धारित विनिर्देशों और दिशानिर्देशों की अनुपालना होगी।
- ग. गैर-अनुपालन के लिए पर्यावरणीय प्रतिकर .-**
- (1) तीन वर्ष के चक्र के प्रथम दो वर्षों में, यदि कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र (कैप्टिव और/ या सह-उत्पादक स्टेशनों या दोनों सहित) ने कम-से-कम 80 प्रतिशत राख (फ्लाई-राख और बॉटम-राख) उपयोग नहीं की है तो ऐसे गैर-अनुपालन ताप विद्युत संयंत्रों पर प्रस्तुत की गई वार्षिक रिपोर्टों के आधार पर वित्तीय वर्ष के

अंत में अप्रयुक्त राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि यह तीन वर्ष के चक्र के तीसरे वर्ष में 100 प्रतिशत राख का उपयोग करने में असमर्थ रहता है, तो वह अप्रयुक्त मात्रा पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर के भुगतान का पात्र होगा, जिस पर पहले पर्यावरणीय प्रतिकर नहीं लगायी गयी है।

परंतु पर्यावरणीय प्रतिकर को पैरा क के उप-पैरा (4) में उल्लिखित विभिन्न उपयोगी श्रेणियों के अनुसार प्रथम अनुपालन चक्र के अंतिम वर्ष के अंत में अनुमान लगाया जाएगा और अधिरोपित किया जाएगा।

- (2) अधिकारियों द्वारा एकत्रित पर्यावरणीय प्रतिकर को केन्द्रीय प्रदूषण नियंत्रण बोर्ड के निर्दिष्ट खाते में जमा किया जाएगा।
- (3) लैगोसी राख के मामले में, यदि कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र (कैप्टिव या सह-उत्पादक स्टेशनों या दोनों सहित) ने स्थापित क्षमता पर आधारित उत्पन्न राख का कम-से-कम 20 प्रतिशत (प्रथम वर्ष के लिए), 35 प्रतिशत (द्वितीय वर्ष के लिए), 50 प्रतिशत (तीसरे से दसवें वर्ष तक) उपयोग के बराबर लक्ष्य प्राप्त नहीं किया है तो उस वित्तीय वर्ष के दौरान अप्रयुक्त लैगोसी राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि 10 वर्ष के अंत में लैगोसी राख का उपयोग नहीं किया जाता है तो 1000 रुपए प्रति टन की दर से शेष अप्रयुक्त मात्रा पर पर्यावरणीय प्रतिकर लगाया जाएगा जिस पर पहले पर्यावरणीय प्रतिकर नहीं लगाया गया है।
- (4) अधिकृत खरीददारों या उपभोक्ता अभिकरणों तक राख भेजने की जिम्मेदारी परिवाहकों या वाहन मालिक की जिम्मेदारी है और यदि इसका अनुपालन नहीं किया जाता है, तो अनधिकृत उपयोगकर्ताओं अथवा गैर-अधिकृत उपयोगकर्ताओं को ऐसी मात्रा गलत तरीके से वितरित करने पर 1500 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगायी, इसके अतिरिक्त राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा गैर अनुपालनकर्ता परिवाहकों पर अभियोजन लागू होगा।
- (5) इस अधिसूचना के पैरा ख में विहित पर्यावरण अनुकूल तरीके में राख के उपयोग की जिम्मेदारी खरीददार या उपभोगकर्ता एजेंसियों की है और ऐसा नहीं करने पर केन्द्रीय प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा 1500 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा।
- (6) यदि उपयोगकर्ता अधिकरण पैरा ख के अधीन निर्धारित सीमा तक अथवा पैरा घ के उप-पैरा (1) के अधीन, दिए गए नोटिस के माध्यम से सूचित की गई सीमा, इनमें से जो भी कम हो, तक राख का उपयोग नहीं करती है, वे अतिरिक्त राख की मात्रा का 1500 रुपए प्रति टन की दर से भुगतान करने के लिए उत्तरदायी होंगी।
परंतु भवन निर्माण के संबंध में पर्यावरणीय प्रतिकर निर्मित क्षेत्र के 75 रुपये प्रति वर्ग फीट की दर से वसूल किया जाएगा।
- (7) (i) ताप विद्युत संयंत्रों अन्य बकायादारों से केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा लगायी गई का पर्यावरणीय प्रतिकर उपयोग अप्रयुक्त राख के सुरक्षित निपटान हेतु किया जाएगा और राख आधारित उत्पादों सहित राख के उपयोग के संबंध में और अधिक अनुसंधान करने के लिए भी निधि का उपयोग किया जा सकता है।
(ii) अप्रयुक्त मात्रा पर लगाए गए पर्यावरणीय प्रतिकर के पश्चात भी राख के उपयोग का उत्तरदायित्व ताप विद्युत संयंत्रों की होगी और यदि पश्चातवती चक्रों में पर्यावरणीय प्रतिकर लगाने के पश्चात ताप विद्युत संयंत्र, किसी विशेष चक्र की राख के उपयोग के लक्ष्य को प्राप्त करता है तो अगले चक्र के दौरान अप्रयुक्त मात्रा पर एकत्र की गई पर्यावरणीय प्रतिकर में 10 प्रतिशत कटौती के पश्चात उक्त रकम ताप विद्युत संयंत्र को वापस कर दी जाएगी और पश्चातवती चक्रों में राख के उपयोग के मामले में एकत्र की गई पर्यावरणीय प्रतिकर की 20 प्रतिशत, 30 प्रतिशत और उसी क्रम में कटौती की जानी है।

घ. राख या राख आधारित उत्पादों की आपूर्ति हेतु प्रक्रिया .-

- (1) ताप विद्युत संयंत्रों के स्वामी अथवा राख की ईंटों या टाईल्स या धातुमल आधारित राख के विनिर्माता उन व्यक्तियों या अभिकरणों को लिखित सूचना देंगे जो बिक्री या परिवहन या दोनों के लिए प्रस्तुत राख या राख आधारित उत्पादों के उपयोग के लिए उत्तरदायी हैं।
- (2) ऐसे व्यक्ति या उपयोगकर्ता अभिकरणों जिन्हें ताप विद्युत संयंत्रों के स्वामी द्वारा या राख की ईंटों या टाईल्स या धातुमल आधारित राख के उत्पादकों द्वारा सूचना दी गई है, यदि वे पहले ही राख या राख उत्पादों के उपयोग के प्रयोजन से अन्य अभिकरणों के साथ जुड़े हुए हैं, यदि वे किसी भी राख/राख उत्पादों का उपयोग नहीं कर सकते हैं अथवा कम मात्रा का उपयोग कर सकते हैं, तदनुसार ताप विद्युत संयंत्र को सूचित करेंगे।

ड. प्रवर्तन, निगरानी, लेखा परीक्षा और प्रतिवेदन करना

- (1) केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी), उपबंधों के अनुपालना सुनिश्चित करने के लिए प्रवर्तन और निगरानी प्राधिकरण होंगे। सीपीसीबी या एसपीसीबी या पीसीसी तिमाही आधार पर राख के उपयोग की निगरानी करेंगे और सीपीसीबी इस प्रयोजन के लिए अधिसूचना की प्रकाशन की तारीख से छः माह के भीतर एक पोर्टल विकसित करेगा। संबंधित जिला अधिकारी के पास इस अधिसूचना के उपबंधों को लागू करने और निगरानी करने के लिए समवर्ती अधिकारिता होगी।
- (2) (i) ताप विद्युत संयंत्र, राख उत्सर्जन और उपयोग से संबंधित मासिक सूचना वेब पोर्टल पर अगले महीने की 5 तारीख तक अपलोड करेगा। कोयला या लिग्नाइट आधारित ताप ऊर्जा संयंत्रों द्वारा केंद्रीय प्रदूषण नियंत्रण बोर्ड, संबंधित राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति (पीसीसी), केंद्रीय विद्युत प्राधिकरण (सीईए) और पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय के संबंधित एकीकृत क्षेत्रीय कार्यालयों को इस अधिसूचना के उपबंधों के अनुपालन संबंधी सूचना उपलब्ध कराते हुए वार्षिक कार्यान्वयन रिपोर्ट प्रत्येक वर्ष (1 अप्रैल से 31 मार्च तक की अवधि के लिए) अप्रैल माह के 30वें दिन तक प्रस्तुत की जाएगी। सीपीसीबी और सीईए द्वारा सभी ताप विद्युत संयंत्रों द्वारा प्रस्तुत वार्षिक रिपोर्टों का समेकन किया जाएगा और उसे पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को 31 मई तक प्रस्तुत किया जाएगा।
- (ii) सभी अन्य उपयोगकर्ता अधिकरण पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय या राज्य स्तरीय पर्यावरण प्रभाव आकलन प्राधिकरण (एसईआईएए) द्वारा जारी पर्यावरणीय मंजूरी (ईसी) अथवा राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा जारी संचालन की सहमति (सीटीओ), जो भी लागू हो, की अनुपालना रिपोर्ट में इस अधिसूचना में आज्ञापकता के अनुसार राख के उपभोग या उपयोग या निस्तारण तथा राख आधारित उत्पादों के उपयोग संबंधी सूचना प्रस्तुत करेंगे। केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) या राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) अधिसूचना के उपबंधों के प्रभावी कार्यान्वयन की समीक्षा करने हेतु ताप विद्युत संयंत्रों के अतिरिक्त अन्य सभी अधिकरणों की राख उपयोग की वार्षिक रिपोर्ट प्रकाशित करेंगे।
- (3) इस अधिसूचना के उपबंधों की निगरानी और कार्यान्वयन के प्रयोजन के लिए केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति का गठन किया जाएगा जिसके सदस्य विद्युत मंत्रालय, कोयला मंत्रालय, खनन मंत्रालय, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, सड़क परिवहन और राजमार्ग मंत्रालय और भारी उद्यम विभाग से होने के साथ-साथ समिति के अध्यक्ष द्वारा नामित किए जाने वाले कोई संबंधित पणधारी होंगे। यह समिति संगत पणधारी को आमंत्रित कर सकती है। यह समिति इस अधिसूचना के उपबंधों के प्रभावी और दक्ष कार्यान्वयन के लिए सिफारिशें कर सकती है। यह समिति छः माह में कम से कम एक बार एक बैठक करेगी और वार्षिक कार्यान्वयन रिपोर्टों की समीक्षा करेगी और यह समिति, इस अधिसूचना द्वारा आज्ञापक किए गए अनुसार छः महीनों में कम से कम एक बार संगत पणधारी (को) को आमंत्रित करके राख के उपयोग की निगरानी करने के लिए पणधारी से साथ परामर्शदात्री बैठकें आयोजित करेगी। यह समिति पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफसीसी) को छः मासिक रिपोर्ट प्रस्तुत करेगी।

- (4) ताप विद्युत संयंत्रों और राख के उपयोगकर्ताओं या राख आधारित उत्पादों के विनिर्माताओं के बीच के विवाद का समाधान करने के प्रयोजन से राज्य सरकारें या संघ राज्यक्षेत्र की सरकारें इस अधिसूचना के प्रकाशन की तारीख से तीन माह के भीतर राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) की अध्यक्षता में एक समिति का गठन करेंगी जिसमें विद्युत विभाग के प्रतिनिधि और एक प्रतिनिधि उस विभाग का होगा, जो विवाद वाले संबंधित अभिकरण का कार्य देख रहे हैं।
- (5) केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) द्वारा प्राधिकृत लेखा परीक्षकों द्वारा ताप विद्युत संयंत्रों और उपयोगकर्ता अभिकरणों द्वारा किए गए राख के निपटान की अनुपालन लेखा परीक्षा संचालित की जाएगी और लेखा परीक्षा की रिपोर्ट प्रत्येक वर्ष 30 नवम्बर तक केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को प्रस्तुत की जाएगी। केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) लेखा परीक्षा की रिपोर्ट प्राप्त होने के पंद्रह दिनों के भीतर अनुपालन न करने वाले ताप विद्युत संयंत्रों के विरुद्ध कार्रवाई प्रारंभ करेंगे।

[फा. सं. एचएसएम-9/1/2019-एचएसएम]

नरेश पाल गंगवार, संयुक्त सचिव

उपाबंध

31 मई तक अथवा उससे पहले प्रस्तुत की जाने वाली राख संबंधी उपबंधों की अनुपालन रिपोर्ट (01 अप्रैल से 31 मार्च की अवधि के लिए)।

क्र.सं.	ब्यौरा	
1.	विद्युत संयंत्र का नाम	
2.	कंपनी का नाम	
3.	जिला	
4.	राज्य	
5.	पत्राचार के लिए डाक का पता :	
6.	ई-मेल :	
7.	विद्युत संयंत्र की संस्थापित क्षमता (मेगा वॉट) :	
8.	संयंत्र लोड फैक्टर (पीएलएफ) :	
9.	उत्पादित यूनिटों की संख्या (एमडब्ल्यूएच) :	
10.	विद्युत संयंत्र के अंतर्गत कुल क्षेत्र (हेक्टेयर) (राख कुंडों के अधीन क्षेत्र सहित) :	
11.	रिपोर्टिंग की अवधि के दौरान कोयला खपत की मात्रा (प्रति वर्ष मीट्रिक टन) :	
12.	औसत राख सामग्री प्रतिशतता में (%) :	
13.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख की मात्रा (प्रति वर्ष मीट्रिक टन) : फ्लाई राख (प्रति वर्ष मीट्रिक टन) : बॉटम राख (प्रति वर्ष मीट्रिक टन) :	
14.	ड्राई फ्लाई राख भंडारण गड्ढा (गड्ढों) की क्षमता (मीट्रिक टन) :	
15.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख के उपयोग का ब्यौरा: (क) रिपोर्टिंग की अवधि के दौरान वर्तमान में उपयोग की गई राख की	

	<p>कुल मात्रा (एमटीपीए) :</p> <p>(ख) उपयोग की गई फ्लाई राख की मात्रा (एमटीपीए) :</p> <ol style="list-style-type: none"> i. फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड/पैनल) : ii. सीमेंट विनिर्माण : iii. रेडी मिक्स कंक्रीट : iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : vi. सड़कों, सड़क और फ्लाई ओवर के पुशतों का निर्माण : vii. बांधों का निर्माण : viii. निम्न भू-क्षेत्र का भराव : ix. खनिज क्षेत्रों का भराव : x. अधिभार वाले डम्पों में उपयोग : xi. कृषि : xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : xiii. अन्य देशों को राख का निर्यात : xiv. अन्य (कृपया विनिर्दिष्ट करें) : <p>(ग) उपयोग किए गए तल के राख की मात्रा (एमटीपीए) :</p> <ol style="list-style-type: none"> i. फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड या पैनल) : ii. सीमेंट विनिर्माण : iii. रेडी मिक्स कंक्रीट : iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : vi. सड़कों, सड़क और फ्लाईओवर के पुशतों का निर्माण : vii. बांधों का निर्माण : viii. निम्न भू-क्षेत्र का भराव : ix. खनिज क्षेत्रों का भराव : x. अधिभार वाले डम्पों में उपयोग : xi. कृषि : xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : xiii. अन्य देशों को राख का निर्यात : xiv. अन्य (कृपया विनिर्दिष्ट करें) : <p>रिपोर्टिंग की अवधि के दौरान वर्तमान में अप्रयुक्त राख की कुल मात्रा (एमटीपीए) :</p>	
16.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख का प्रतिशतता उपयोग (%) :	
17.	<p>राख कुंडों में राख के निपटान का ब्यौरा</p> <p>क) तारीख 31 मार्च तक (रिपोर्टिंग की अवधि को छोड़कर) राख कुण्ड (कुण्डों) में निपटान किए गए राख की कुल मात्रा (मीट्रिक टन):</p>	

	<p>ख) रिपोर्टिंग की अवधि के दौरान राख कुण्ड (कुण्डों) में निपटान किए गए राख की मात्रा (मीट्रिक टन):</p> <p>ग) रिपोर्टिंग की अवधि के दौरान राख कुण्डों में गारा निस्सरण हेतु खपत हुए जल की कुल मात्रा (मी³):</p> <p>घ) राख कुण्डों की कुल संख्या:</p> <p>(i) सक्रिय:</p> <p>(ii) खाली किए गए (पुनः भरा जाना है)</p> <p>(iii) पुनः भरे गए:</p> <p>ड.) राख कुण्डों के अधीन कुल क्षेत्र (हेक्टेयर):</p>	
18.	<p>अलग-अलग राख कुण्ड का ब्यौरा</p> <p>राख कुण्ड 1,2 आदि (यदि राख कुण्डों की संख्या एक से अधिक हो, तो कृपया निम्नलिखित ब्यौरा अलग से उपलब्ध कराएं)</p> <p>क) स्थिति: निर्माणाधीन या सक्रिय या खाली किया गया या पुनः भरा गया</p> <p>ख) राख कुण्ड में राख का निपटान शुरू करने की तारीख/महीना/वर्ष या महीना/वर्ष):</p> <p>ग) राख कुण्ड की क्षमता पूर्ण किए जाने के पश्चात् उसमें राख निपटान रोकने की तारीख</p> <p>(तारीख/महीना/वर्ष या महीना/वर्ष):</p> <p>(सक्रिय राख कुण्डों के लिए लागू नहीं)</p> <p>ग) क्षेत्र (हेक्टेयर):</p> <p>घ) डाइक की ऊंचाई (मी.):</p> <p>घ) आयतन (मी³):</p> <p>ड.) तारीख 31 मार्च तक निपटान किए गए राख की मात्रा (मीट्रिक टन):</p> <p>च) उपलब्ध आयतन का प्रतिशत (%) और आगे निपटान किए जा सकने वाले राख की मात्रा (मीट्रिक टन):</p> <p>छ) राख कुण्ड के भरे जाने की अनुमानित अवधि (वर्षों और महीनों की संख्या):</p> <p>ड.) निर्देशांक (अक्षांश और देशान्तर):</p> <p>(कृपया न्यूनतम 4 निर्देशांकों को विनिर्दिष्ट करें)</p> <p>ज) राख कुण्ड में की गई लाइनिंग का प्रकार: एचडीपीई लाइनिंग या एलडीपीई लाइनिंग या क्ले लाइनिंग या कोई लाइनिंग नहीं</p> <p>छ) निपटान की विधि: शुष्क निपटान या नम गारा (नम गारा के मामले में कृपया विनिर्दिष्ट करें कि क्या एचसीएसडी या एमसीएसडी या एलसीएसडी है)</p> <p>ज) राख का अनुपात: गारा मिश्रण में जल (1:___):</p> <p>झ) संस्थापित और कार्यशील राख जल पुनर्चक्रण प्रणाली (एडब्ल्यूआरएस): हां या नहीं</p> <p>ञ) जमीन के अंदर या जल निकाय में राख कुण्ड से निस्सरित अपशिष्ट जल की मात्रा (मी³):</p> <p>ट) डाइक की स्थिरता का अध्ययन कराए जाने की पिछली तारीख और उस संगठन का नाम जिसने अध्ययन किया:</p> <p>ठ) लेखा-परीक्षा किए जाने की पिछली तारीख और उस संगठन का नाम जिसने लेखा-परीक्षा की:</p>	
19.	<p>उपयोग किए गए पुराने राख की मात्रा (एमटीपीए):</p> <p>i. फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर</p>	

	सीमेंट शीट या पाइप या बोर्ड या पैनल):			
	ii. सीमेंट विनिर्माण:			
	iii. रेडी मिक्स कंक्रीट:			
	iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री:			
	v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण:			
	vi. सड़कों, सड़क और फ्लाई ओवर के पुशतों का निर्माण:			
	vii. बांधों का निर्माण:			
	viii. निम्न भू-क्षेत्र का भराव:			
	ix. खनिज क्षेत्रों का भराव:			
	x. अधिभार वाले डम्पों में उपयोग:			
	xi. कृषि:			
	xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण:			
	xiii. अन्य देशों को राख का निर्यात			
	xiv. अन्य (कृपया विनिर्दिष्ट करें):			
20.	सार :			
	व्यौरा	सृजित मात्रा (एमटीपी)	उपयोग की गई मात्रा (एमटीपी) और (%)	शेष मात्रा (एमटीपी)
	रिपोर्टिंग की अवधि के दौरान राख			
	पुरानी राख			
	कुल			
21.	कोई अन्य सूचना : वार्षिक अनुपालन रिपोर्ट, और विद्युत संयंत्रों और राख कुण्डों की शेष फाइलों की सॉफ्ट कॉपी ई-मेल:- moefcc- coalash@gov.in पर भेजी जाए।			
22.	प्राधिकृत हस्ताक्षरकर्ता के हस्ताक्षर			

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 31st December, 2021

S.O. 5481(E).—Whereas by notification of the Government of India in the erstwhile Ministry of Environment and Forests *vide* S.O.763 (E), dated the 14th September, 1999, as amended from time to time, the Central Government, issued directions for restricting the excavation of top soil for manufacturing of bricks and promoting the utilisation of fly ash in the manufacturing of building materials and in construction activity within a specified radius of three hundred kilometres from the coal or lignite based thermal power plants;

And whereas, to implement the aforesaid notification more effectively based on the polluter pays principle (PPP) thereby ensuring 100 per cent utilisation of fly ash by the coal or lignite based thermal power plants and for the sustainability of the fly ash management system, the Central Government reviewed the existing notification; and whereas environmental compensation needs to be introduced based on the polluter pays principle;

And whereas, there is a need to conserve top soil by promoting manufacture and mandating use of ash based products and building materials in the construction sector;

And whereas, there is a need to conserve top soil and natural resources by promoting utilisation of ash in road laying, road and flyover embankments, shoreline protection measures, low lying areas of approved projects, backfilling of mines, as an alternative for filling of earthen materials;

And whereas, it is necessary to protect the environment and prevent the dumping and disposal of fly ash discharged from coal or lignite based thermal power plants on land;

And whereas, in the said notification the phrase 'ash', has been used which includes both fly ash as well as bottom ash generated from the Coal or Lignite based thermal power plants;

And whereas, the Central Government intends to bring out a comprehensive framework for ash utilisation including system of environmental compensation based on polluter pays principle;

And whereas, a draft notification on ash utilisation by coal or lignite thermal power plants in supersession of the notification of the Government of India, Ministry of Environment and Forests published in the Gazette of India, Extra Ordinary part II, section 3, sub-section (i) *vide* S.O.763 (E), dated the 14th September, 1999, by notification in exercise of the powers conferred under sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, was published in the Gazette of India, Extraordinary, Part II, section 3, sub-section (i), *vide* G.S.R. 285(E), dated the 22nd April, 2021 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of sixty days from the date on which copies of the Gazette containing the said draft provisions were made available to the public;

And, whereas all the objections and suggestions received from all persons likely to be affected thereby in respect of the said draft notification have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, and in supersession of the Notification S.O.763 (E), dated the 14th September, 1999 except as respect things done or omitted to be done before such supersession, the Central Government hereby issues the following notification on ash utilisation from coal or lignite thermal power plants which shall come into force on the date of the publication of this notification, namely:-

A. Responsibilities of thermal power plants to dispose fly ash and bottom ash.—

- (1) Every coal or lignite based thermal power plant (including captive or co-generating stations or both) shall be primarily responsible to ensure 100 per cent utilisation of ash (fly ash, and bottom ash) generated by it in an eco-friendly manner as given in sub-paragraph (2);
- (2) The ash generated from coal or lignite based thermal power plants shall be utilised only for the following eco-friendly purposes, namely:-
 - (i) Fly ash based products viz. bricks, blocks, tiles, fibre cement sheets, pipes, boards, panels;
 - (ii) Cement manufacturing, ready mix concrete;
 - (iii) Construction of road and fly over embankment, Ash and Geo-polymer based construction material;
 - (iv) Construction of dam;
 - (v) Filling up of low lying area;
 - (vi) Filling of mine voids;
 - (vii) Manufacturing of sintered or cold bonded ash aggregate;
 - (viii) Agriculture in a controlled manner based on soil testing;
 - (ix) Construction of shoreline protection structures in coastal districts;

- (x) Export of ash to other countries;
- (xi) Any other eco-friendly purpose as notified from time to time.
- (3) A committee shall be constituted under the chairmanship of Chairman, Central Pollution Control Board (CPCB) and having representatives from Ministry of Environment, Forest and Climate Change (MoEFCC), Ministry of Power, Ministry of Mines, Ministry of Coal, Ministry of Road Transport and Highways, Department of Agricultural Research and Education, Institute of Road Congress, National Council for Cement and Building Materials, to examine and review and recommend the eco-friendly ways of utilisation of ash and make inclusion or exclusion or modification in the list of such ways as mentioned in Sub-paragraph (2) based on technological developments and requests received from stakeholders. The committee may invite State Pollution Control Board or Pollution Control Committee, operators of thermal power plants and mines, cement plants and other stakeholders as and when required for this purpose. Based on the recommendations of the Committee, Ministry of Environment, Forest and Climate Change (MoEFCC) may publish such eco-friendly purpose.
- (4) Every coal or lignite based thermal power plant shall be responsible to utilise 100 per cent ash (fly ash and bottom ash) generated during that year, however, in no case shall utilisation fall below 80 per cent in any year, and the thermal power plant shall achieve average ash utilisation of 100 per cent in a three years cycle:

Provided that the three years cycle applicable for the first time is extendable by one year for the thermal power plants where ash utilisation is in the range of 60-80 per cent, and two years where ash utilisation is below 60 per cent and for the purpose of calculation of percentage of ash utilisation, the percentage quantity of utilisation in the year 2021- 2022 shall be taken into account as per the table below:

Utilisation percentages of thermal power plants	First compliance Cycle to meet 100 per cent utilisation	Second compliance cycle onwards, to meet 100 per cent utilisation
>80 per cent	3 years	3 years
60-80 per cent	4 years	3 years
<60 per cent	5 years	3 years

Provided further that the minimum utilisation percentage of 80 per cent shall not be applicable to the first year and first two years of the first compliance cycle for the thermal power plants under the utilisation category of 60-80 per cent and <60 per cent, respectively.

Provided also that 20per cent of ash generated in the final year of compliance cycle may be carried forward to the next cycle which shall be utilised in the next three years cycle along with the ash generated during that cycle.

- (5) The unutilised accumulated ash i.e. legacy ash, which is stored before the publication of this notification, shall be utilised progressively by the thermal power plants in such a manner that the utilization of legacy ash shall be completed fully within ten years from the date of publication of this notification and this will be over and above the utilisation targets prescribed for ash generation through current operations of that particular year:

Provided that the minimum quantity of legacy ash in percentages as mentioned below shall be utilised during the corresponding year and the minimum quantity of legacy ash is to be calculated based on the annual ash generation as per installed capacity of thermal power plant.

Year from date of publication	1 st	2 nd	3 rd -10 th
Utilisation of legacy ash (in percentage of Annual ash)	At least 20 per cent	At least 35 per cent	At least 50 per cent

Provided further that the legacy ash utilisation shall not be required where ash pond or dyke has stabilised and the reclamation has taken place with greenbelt or plantation and the concerned State Pollution Control Board shall certify in this regard. Stabilisation and reclamation of an ash pond or dyke including certification by the Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be carried out within a year from the date of publication of this notification. The ash remaining in all other ash ponds or dykes shall be utilised in progressive manner as per the above mentioned timelines.

Note: The obligations under sub-paragraph (4) and (5) above for achieving the ash utilisation targets shall be applicable from 1st April, 2022.

- (6) Any new as well as operational thermal power plant may be permitted an emergency or temporary ash pond with an area of 0.1 hectare per Mega Watt (MW). Technical specifications of ash ponds or dykes shall be as per the guidelines of Central Pollution Control Board (CPCB) made in consultation with Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the ash pond or dyke on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and greenbelt, etc., and shall be put in place within three months from the date of publication of this notification.
- (7) Every coal or lignite based thermal power plant shall ensure that loading, unloading, transport, storage and disposal of ash is done in an environmentally sound manner and that all precautions to prevent air and water pollution are taken and status in this regard shall be reported to the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) in Annexure attached to this notification.
- (8) Every coal or lignite based thermal power plant shall install dedicated silos for storage of dry fly ash silos for at least sixteen hours of ash based on installed capacity and it shall be reported upon to the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) in the Annexure and shall be inspected by Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) from time to time.
- (9) Every coal or lignite based thermal power plant (including captive or co-generating stations or both) shall provide real time data on daily basis of availability of ash with Thermal Power Plant (TPP), by providing link to Central Pollution Control Board's web portal or mobile phone App for the benefit of actual user(s).
- (10) Statutory obligation of 100 per cent utilisation of ash shall be treated as a change in law, wherever applicable.

B. For the purpose of utilisation of ash, the subsequent sub-paras shall apply.—

- (1) All agencies (Government, Semi-government and Private) engaged in construction activities such as road laying, road and flyover embankments, shoreline protection structures in coastal districts and dams within 300 kms from the lignite or coal based thermal power plants shall mandatorily utilise ash in these activities:

Provided that it is delivered at the project site free of cost and transportation cost is borne by such coal or lignite based thermal power plants.

Provided further that thermal power plant may charge for ash cost and transportation as per mutually agreed terms, in case thermal power plant is able to dispose the ash through other means and those agencies makes a request for it and the provisions of ash free of cost and free transportation shall be applicable, if thermal power plant serves a notice on the construction agency for the same.

- (2) The utilisation of ash in the said activities shall be carried out in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Road Congress, Central Building Research Institute, Roorkee, Central Road Research Institute, Delhi, Central Public Works Department, State Public Works Departments and other Central and State Government Agencies.

- (3) It shall be obligatory on all mines located within 300 kilometres radius of thermal power plant, to undertake backfilling of ash in mine voids or mixing of ash with external Overburden dumps, under Extended Producer Responsibility (EPR). All mine owners or operators (Government, Public and Private Sector) within three hundred kilometres (by road) from coal or lignite based thermal power plants, shall undertake measures to mix at least 25 per cent of ash on weight to weight basis of the materials used for external dump of overburden, backfilling or stowing of mine (running or abandoned as the case may be) as per the guidelines of the Director General of Mines Safety (DGMS):

Provided that such thermal power stations shall facilitate the availability of required quantity of ash by delivering ash free of cost and bearing the cost of transportation or cost of transportation arrangement decided on mutually agreed terms and mixing of ash with overburden in mine voids and dumps shall be applicable for the overburden generated from the date of publication of this notification and the utilisation of ash in the said activities shall be carried out in accordance with guidelines laid down by the Central Pollution Control Board, Director General of Mines Safety and Indian Bureau of Mines.

Explanation.- For the purpose of this sub-paragraph, it is also clarified that the provisions of ash free of cost and free transportation shall be applicable, if thermal power plants serve a notice on the mine owner for the same and the mandate of using 25 per cent of ash for mixing with overburden dump and filling up of mine voids shall not be applicable unless a notice is served on the mine owner by thermal power plant.

- (4) (i) All mine owners shall get mine closure plans (progressive and final) to accommodate ash in the mine voids and the concerned authority shall approve mine plans for disposal of ash in mine voids and mixing of ash with overburden dumps. The Ministry of Environment, Forest and Climate Change (MoEFCC) has issued guidelines on 28th August, 2019 regarding exemption of requirement of Environmental Clearance of thermal power plants and coal mines along with the guidelines to be followed for such disposal.
- (ii) The Ministry in consultation with Central Pollution Control Board (CPCB), Director General of Mine Safety (DGMS) and Indian Bureau of Mines (IBM) may issue further guidelines time to time to facilitate ash disposal in mine voids and mixing with overburden dumps and it shall be the responsibility of mine owners to get the necessary amendments or modifications in the permissions issued by various regulatory authorities within one year from the date of identification of such mines.
- (5) (i) There shall be a committee headed by Chairperson, Central Pollution Control Board (CPCB) with representatives from Ministry of Environment, Forest and Climate Change, Ministry of Power, Ministry of Mines, Ministry of Coal, Director General of Mine Safety and Indian Bureau of Mines for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump including examination of safety, feasibility (not economic feasibility) and aspects of environmental contamination and the committee shall get updated quarterly reports prepared regarding identified mines (both underground and opencast) for the stakeholder Ministries or Departments and the committee shall start identifying the suitable mines immediately after the publication of this notification.
- (ii) Thermal power plants or mines shall not wait for disposal of ash till the identification is done by the above mentioned committee, to meet the utilisation targets mandated as above.
- (6) Filling of low lying areas with ash shall be carried out with prior permission of the State Pollution Control Board or Pollution Control Committee for approved projects, and in accordance with guidelines laid down by Central Pollution Control Board (CPCB) and the State Pollution Control Board or Pollution Control Committee (PCC) shall publish approved sites, location, area and permitted quantity annually on its website.
- (7) Central Pollution Control Board after engaging relevant stakeholders, shall put in place the guidelines within one year for all types of activities envisaged under this notification including putting in place time bound online application process for the grant permission by State Pollution Control Boards (SPCBs) or Pollution Control Committees (PCCs).

- (8) All building construction projects (Central, State and Local authorities, Govt. undertakings, other Govt. agencies and all private agencies) located within a radius of three hundred kilometres from a coal or lignite based thermal power plant shall use ash bricks, tiles, sintered ash aggregate or other ash based products, provided these are made available at prices not higher than the price of alternative products.
- (9) Manufacturing of ash based products and use of ash in such products shall be in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Road Congress, and Central Pollution Control Board.

C. Environmental compensation for non-compliance.—

- (1) In the first two years of a three years cycle, if the coal or lignite based thermal power plant (including captive or co-generating stations or both) has not achieved at least 80 per cent ash (fly ash and bottom ash) utilisation, then such non-compliant thermal power plants shall be imposed with an environmental compensation of Rs. 1000 per ton on unutilised ash during the end of financial year based on the annual reports submitted and if it is unable to utilise 100 per cent of ash in the third year of the three years cycle, it shall be liable to pay an environmental compensation of Rs. 1000 per ton on the unutilised quantity on which environmental compensation has not been imposed earlier:

Provided that the environmental compensation shall be estimated and imposed at the end of last year of the first compliance cycle as per the various utilisation categories as mentioned in sub-paragraph (4) of Para A.

- (2) Environmental compensation collected by the authorities shall be deposited in the designated account of Central Pollution Control Board.
- (3) In case of legacy ash, if the coal or lignite based thermal power plant (including captive or co-generating stations or both) has not achieved utilisation equivalent to at least 20 per cent (for the first year), 35 per cent (for the second year), 50 per cent (for third to tenth year) of ash generated based on installed capacity, an environmental compensation of Rs. 1000 per ton of unutilised legacy ash during that financial year shall be imposed and if the utilization of legacy ash is not completed at the end of 10 years, an environmental compensation of Rs.1000 per ton shall be imposed on the remaining unutilised quantity which has not been imposed earlier.
- (4) It shall be the responsibility of the transporters or vehicle owner to deliver ash to authorised purchaser or user agency and if it is not complied, then an environmental compensation of Rs. 1500 per ton on such quantity as mis-delivered to unauthorised users or non- delivered to authorised users will be imposed besides prosecution of such non-compliant transporters by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC).
- (5) It is the responsibility of the purchasers or user agencies to utilise ash in an eco-friendly manner as laid down at para B of this notification and if it is not complied, then an environmental compensation of Rs. 1500 per ton shall be imposed by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC).
- (6) If the user agencies do not utilise ash to the extent obligated under para B or the extent to which they have been intimated through Notice(s) served under sub-paragraph (1) of para D, whichever is lower, they shall be liable to pay Rs. 1500 per ton of ash for the quantity they fall short off:

Provided that the environmental compensation on building constructions shall be levied at Rs.75/- per square feet of built up area of construction.

- (7) (i) The environmental compensation collected by Central Pollution Control Board from the thermal power plants and other defaulters shall be used towards the safe disposal of the unutilised ash and the fund may also be utilised for advancing research on use of ash including ash based products.

(ii) The liability of ash utilisation shall be with thermal power plants even after imposition of environmental compensation on unutilised quantities and in case thermal power plant achieves the ash utilisation of any

particular cycle after imposition of environmental compensation in subsequent cycles, the said amount shall be returned to thermal power plant after deducting 10 per cent of the environmental compensation collected on the unutilised quantity during the next cycle and deduction of 20 per cent, 30 per cent, and so on, of the environmental compensation collected is to be made in case of utilisation of ash in subsequent cycles.

D. Procedure for supply of ash or ash based products.—

- (1) The owner of thermal power plants or manufacturers of ash bricks or tiles or sintered ash aggregate shall serve written notice to persons or agencies who are liable to utilise ash or ash based products, offering for sale, or transport or both.
- (2) Persons or user agencies who have been served notices by owner of thermal power plants or manufacturers of ash bricks or tiles or sintered ash aggregate, if they have already tied up with other agencies for the purpose of utilisation of ash or ash products, shall inform the thermal power plant accordingly, if they cannot use any ash or ash products or use reduced quantity.

E. Enforcement, Monitoring, Audit and Reporting.—

- (1) The Central Pollution Control Board (CPCB) and the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be the enforcing and monitoring authority for ensuring compliance of the provisions and shall monitor the utilisation of ash on quarterly basis. Central Pollution Control Board shall develop a portal for the purpose within six months of date of publication of the notification. The concerned District Magistrate shall have concurrent jurisdiction for enforcement and monitoring of the provisions of this notification.
- (2) (i) Thermal power plants shall upload monthly information regarding ash generation and utilisation by 5th of the next month on the web portal. Annual implementation report (for the period 1st April to 31st March) providing information about the compliance of provisions in this notification shall be submitted by the 30th day of April, every year to the Central Pollution Control Board, concerned State Pollution Control Board or Pollution Control Committee (PCC), Central Electricity Authority (CEA), and concerned Integrated Regional Office of Ministry of Environment, Forest and Climate Change by the coal or lignite based thermal power plants. Central Pollution Control Board and Central Electricity Authority shall compile the annual reports submitted by all the thermal power plants and submit to Ministry of Environment, Forest and Climate Change by 31st May.
 - (ii) All other user agencies shall submit consumption or utilisation or disposal of ash and use of ash based products as mandated in this notification in the compliance report of Environmental Clearance (EC) issued by Ministry of Environment, Forest and Climate Change or State Level Environment Impact Assessment Authority (SEIAA) or Consent to Operate (CTO) issued by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC), whichever is applicable. The Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall publish annual report of ash utilisation of all other agencies except thermal power plants to review the effective implementation of the provisions of the notification.
- (3) For the purpose of monitoring the implementation of the provisions of this notification, a committee shall be constituted under the Chairperson, Central Pollution Control Board (CPCB), with members from Ministry of Power, Ministry of Coal, Ministry of Mines, Ministry of Environment, Forest and Climate Change, Ministry Road Transportation and Highways, Department of Heavy Industry as well as any concerned stakeholder(s), to be nominated by the Chairman of the committee. The committee may make recommendations for effective and efficient implementation of the provisions of the notification. The committee shall meet at least once in six months and review annual implementation reports and the committee shall also hold stakeholder consultations for monitoring of ash utilisation as mandated by this notification by inviting relevant stakeholder(s) at least once in six months. The committee shall submit the six monthly report to Ministry of Environment, Forest and Climate Change (MoEFCC).

- (4) For the purpose of resolving disputes between thermal power plants and users of ash or manufacturer of ash based products, the State Governments or Union territory administration constitute a Committee within three months from the date of publication of this notification under the Chairman, State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) with representatives from Department of Power, and one representative from the Department which deals with the subject of concerned agency with which dispute is made.
- (5) The compliance audit for ash disposal by the thermal power plants and the user agency shall be conducted by auditors, authorised by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report.

[F. No. HSM-9/1/2019-HSM]

NARESH PAL GANGWAR, Jt. Secy.

AnnexureAsh Compliance Report (for the period 1st April-31st March) to be submitted on or before 31st May.

Sl. No.	Details	
1.	Name of Power Plant	
2.	Name of the company	
3.	District	
4.	State	
5.	Postal address for communication:	
6.	E-mail:	
7.	Power Plant installed capacity (MW):	
8.	Plant Load Factor (PLF):	
9.	No. of units generated (MWh):	
10.	Total area under power plant (ha): (including area under ash ponds)	
11.	Quantity of coal consumption during reporting period (Metric Tons per Annum):	
12.	Average ash content in percentage (per cent):	
13.	Quantity of current ash generation during reporting period (Metric Tons per Annum): Fly ash (Metric Tons per Annum): Bottom ash (Metric Tons per Annum):	
14.	Capacity of dry fly ash storage silo(s) (Metric Tons) :	
15.	Details of utilisation of current ash generated during reporting period (a) Total quantity of current ash utilised (MTPA) during reporting period: (b) Quantity of fly ash utilised (MTPA): (i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels) (ii) Cement manufacturing:	

	<ul style="list-style-type: none"> (iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and fly over embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts; (xiii) Export of ash to other countries: (xiv) Others (please specify): <p>(c) Quantity of bottom ash utilised (MTPA):</p> <ul style="list-style-type: none"> (i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): (ii) Cement manufacturing: (iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and flyover embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts: (xiii) Export of ash to other countries: (xiv) Others (please specify): <p>Total quantity of current ash unutilised (MTPA) during reporting period:</p>	
16.	Percentage utilisation of current ash generated during reporting period (per cent):	
17.	<p>Details of disposal of ash in ash ponds</p> <p>(a) Total quantity of ash disposed in ash pond(s) (Metric Tons) as on 31st March (excluding reporting period):</p> <p>(b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons):</p> <p>(c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m³):</p> <p>(d) Total number of ash ponds:</p> <ul style="list-style-type: none"> (i) Active: (ii) Exhausted (yet to be reclaimed): (iii) Reclaimed: <p>(e) total area under ash ponds (ha):</p>	
18.	<p>Individual ash pond details</p> <p><i>Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one)</i></p> <p>(a) Status: Under construction or Active or Exhausted or</p>	

	<p>Reclaimed</p> <p>(b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY):</p> <p>(c) Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds)</p> <p>(c) area (hectares):</p> <p>(d) dyke height (m):</p> <p>(d) volume (m³):</p> <p>(e) quantity of ash disposed as on 31st March (Metric Tons):</p> <p>(f) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons):</p> <p>(g) expected life of ash pond (number of years and months):</p> <p>(e) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates)</p> <p>(f) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining</p> <p>g) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD)</p> <p>(h) Ratio of ash: water in slurry mix (1:___):</p> <p>(i) Ash water recycling system (AWRS) installed and functioning: Yes or No</p> <p>(j) Quantity of wastewater from ash pond discharged into land or water body (m³):</p> <p>(k) Last date when the dyke stability study was conducted and name of the organisation who conducted the study:</p> <p>(l) Last date when the audit was conducted and name of the organisation who conducted the audit:</p>									
19.	<p>Quantity of legacy ash utilised (MTPA):</p> <ol style="list-style-type: none"> i. Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): ii. Cement manufacturing: iii. Ready mix concrete: iv. Ash and Geo-polymer based construction material: v. Manufacturing of sintered or cold bonded ash aggregate: vi. Construction of roads, road and flyover embankment: vii. Construction of dams: viii. Filling up of low lying area: ix. Filling of mine voids: x. Use in overburden dumps: xi. Agriculture: xii. Construction of shoreline protection structures in coastal districts; xiii. Export of ash to other countries: xiv. Others (please specify): 									
20.	<table border="1"> <tr> <td colspan="4" data-bbox="268 1935 1433 1980">Summary:</td> </tr> <tr> <td data-bbox="268 1980 568 2054">Details</td> <td data-bbox="568 1980 868 2054">Quantity generated (MTP)</td> <td data-bbox="868 1980 1152 2054">Quantity utilised (MTP) and (per cent)</td> <td data-bbox="1152 1980 1433 2054">Balance quantity (MTP)</td> </tr> </table>	Summary:				Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)	
Summary:										
Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)							

	Current ash during reporting period			
	Legacy ash			
	Total			
21.	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcc-coalash@gov.in			
22.	Signature of Authorised Signatory			



भारत का राजपत्र The Gazette of India

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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित
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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 30 दिसम्बर, 2022

का.आ. 6169(अ).—पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय में भारत सरकार ने पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए भारत के राजपत्र, असाधारण, भाग II, खंड 3 उप खंड (ii) का.आ. 5481(अ), तारीख 31 दिसंबर, 2021 द्वारा एक अधिसूचना जारी की थी (जिन्हें इसमें इसके पश्चात इसे राख के उपयोग से संबंधित अधिसूचना कहा गया है);

और, राख के उपयोग से संबंधित अधिसूचना के उपबंधों के कार्यान्वयन के संबंध में विद्युत मंत्रालय, ताप विद्युत संयंत्रों और विभिन्न हितधारकों से अनुरोध प्राप्त हुए हैं;

और, राख के उपयोग से संबंधित अधिसूचना के कार्यान्वयन में सुचारू परिवर्तन लाने हेतु उक्त अधिसूचना के कतिपय उपबंधों में संशोधन लाना उचित है;

अतः अब, केन्द्रीय सरकार पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (1), (2) और (4) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, जारी राख के उपयोग संबंधी अधिसूचना में निम्नलिखित संशोधन करती है, अर्थात्:-

जारी राख के उपयोग से संबंधित अधिसूचना में संशोधन –

1. पैरा क में, -

(i) उप पैरा क (4) में, तीसरे परंतुक के पश्चात निम्नलिखित परन्तुक अंतर्विष्ट किया जाएगा, अर्थात् :

“परन्तु, यह भी कि इस अधिसूचना के प्रकाशन की तारीख को अथवा उसके पश्चात् स्थापित नए ताप विद्युत संयंत्र सारणी में यथा विनिर्दिष्ट 60 प्रतिशत से कम ताप विद्युत संयंत्रों के लिए विनिर्दिष्ट अनुपालन चक्र के समान प्रथम अनुपालन चक्र का अनुसरण करेंगे।

टिप्पण : लागू अनुपालन चक्र के अनुसार उपयोग के लक्ष्य 1 अप्रैल, 2022 से प्रभावी होंगे।”

(ii) उप पैरा 5 में, -

(क) आरंभिक पैरा में, “इस अधिसूचना के प्रकाशन की तारीख” शब्दों के स्थान पर “1 अप्रैल, 2022” उक्त अक्षर और शब्द रखे जाएंगे;

(ख) दूसरे परंतुक में, -

(i) “हरित पट्टी या पौधरोपण” के पश्चात, “या उप पैरा (6) में यथा विनिर्दिष्ट केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) द्वारा जारी मार्गदर्शी सिद्धांतों के अनुसार सौर ऊर्जा संभव या पवन ऊर्जा संयंत्र” शब्द कोष्ठकों और अक्षरों को अंतःस्थापित किए जाएंगे;

(ii) “केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) या” शब्द कोष्ठक और अक्षर हटा दिया जाएगा।

(iii) “एक वर्ष” शब्दों के स्थान पर “तीन वर्ष” शब्दों को रखा जाएगा।

(iv) “इस अधिसूचना के प्रकाशन की तारीख” शब्दों के स्थान पर “1 अप्रैल, 2022” उक्त अक्षर और शब्द रखे जाएंगे;

(ग) दूसरे परंतुक के पश्चात निम्नलिखित उपलब्ध अंतःस्थापित किया जाएगा, अर्थात् :

“परंतु कि पैरा क (6) में यथाविनिर्दिष्ट राख के अस्थायी भंडारण हेतु अभिहित किए गए संचालित राख कुंड या डाइक के सिवाय सभी राख कुंडों या डाइक में संग्रहीत राख में पुरानी राख एकत्रित होगी और या तो इसे पुनःप्राप्त या स्थिर या उपयोग करना होगा।”

(iii) उप पैरा (6) के स्थान, उप पैरा रखा जाएगा, अर्थात्:

“(6) किसी भी नए और साथ ही चालू थर्मल पावर प्लांट को 0.1 हेक्टेयर प्रति मेगा वाट (मेगावाट) के क्षेत्र में राख के अस्थायी भंडारण के लिए परिचालन राख तालाब या डाइक की अनुमति दी जा सकती है। केन्द्रीय विद्युत प्राधिकरण के परामर्श से बनाए गए केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) के दिशा-निर्देशों के अनुसार परिचालन के साथ-साथ स्थिर और पुनः दावा किए गए राख तालाबों या बांधों की तकनीकी विशिष्टताओं के अनुसार होंगे और ये दिशानिर्देश वार्षिक प्रमाणन के लिए एक प्रक्रिया भी निर्धारित करेंगे। परिचालन के साथ-साथ राख तालाब या डाइक को उसकी सुरक्षा, पर्यावरण प्रदूषण, उपलब्ध मात्रा, निपटान के तरीके, पानी की खपत या निपटान में संरक्षण, राख जल पुनर्चक्रण और हरित पट्टी, आदि पर परिचालन के साथ-साथ स्थिर और पुनः प्राप्त किया जाएगा और इस अधिसूचना के प्रकाशन की तारीख से तीन महीने भीतर रखा जाएगा :

परंतु कि 31 दिसंबर, 2021 से पहले चालू किए गए ताप विद्युत संयंत्रों के लिए 1600 मेगावाट से कम या उसके बराबर स्थापित क्षमता वाले दो परिचालन राख तालाबों या डाइकों तक और 1600 से अधिक स्थापित क्षमता वाले ताप विद्युत संयंत्रों के लिए चार परिचालन राख तालाबों या बांधों तक MW, मौजूदा राख तालाबों या बांधों से निर्दिष्ट क्षेत्र के भीतर कई लैगून होने पर, निर्देशांक के साथ स्पष्ट सीमांकन के साथ नामित किया जा सकता है, और केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी)/प्रदूषण को सूचित करेगा। नियंत्रण समिति (पीसीसी) 31 मार्च, 2023 तक :

परंतु आगे कि नए थर्मल पावर प्लांट या मौजूदा थर्मल पावर प्लांट के विस्तार के मामले में केवल एक ऐश पॉड या डाइक की अनुमति दी जाएगी 31 दिसंबर, 2021 को या उसके बाद, जो केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी)/प्रदूषण नियंत्रण समिति (पीसीसी) को कमीशन की तारीख से 3 महीने के भीतर निर्देशांक के साथ सीमांकन के विवरण की सूचना देगा। थर्मल पावर प्लांट या 31 मार्च, 2023 तक, जो भी बाद में हो :

परंतु यह और कि कोयला और लिग्नाइट आधारित तापीय विद्युत संयंत्रों को आगे किसी भी नए कार्यशील राख कुंड या डाइक को स्थापित करने या नाम निर्दिष्ट करने की अनुमति नहीं दी जाएगी।

परंतु यह और कि कार्यशील राख कुंड या डाइक की 0.1 हे./मेगावॉट (एमडब्ल्यू) का विनिर्देशन तारीख 3 नवम्बर, 2009 से पूर्व चालू तापीय विद्युत संयंत्रों पर लागू नहीं होंगे।”

2. पैरा ख में, -

(i) उप पैरा (1) में, “300 कि.मी. के भीतर” शब्दों कोष्ठकों और आंकड़ों के स्थान पर “300 कि.मी. के रेडियस के भीतर” शब्द कोष्ठक और आंकड़े रखे जाएंगे।

(ii) उप पैरा (8) में, उच्चतर “वैकल्पिक उत्पादों के मूल्य से अधिक” शब्दों के स्थान पर “केन्द्रीय लोक कार्य विभाग (सीपीडब्ल्यूडी) या संबंधित लोक कार्य विभाग (पीडब्ल्यूडी) द्वारा विनिर्दिष्ट दरों की अनुसूची में उल्लिखित मूल्य या दरों की अनुसूची के अधीन निर्धारित न होने परल वैकल्पिक उत्पादों का मूल्य” शब्द रखे जाएंगे।

3. पैरा घ में, -

(i) उप पैरा (2) के स्थान, उप पैरा रखा जाएगा, अर्थात्:

“(2) जिन व्यक्तियों या उपयोगकर्ता या एजेंसियों को थर्मल पावर प्लांट के मालिक द्वारा नोटिस दिया गया है, अगर वे राख के उपयोग के उद्देश्य से पहले से ही अन्य एजेंसियों के साथ करार कर चुके हैं तो थर्मल पावर प्लांट को तदनुसार सूचित करेंगे और यदि वे उपयोग नहीं कर सकते हैं कोई राख या कम मात्रा का उपयोग कर सकता है।”

(ii) उप-पैरा (2) के पश्चात्, निम्नलिखित उप-पैरा अंतःस्थापित किया जाएगा, अर्थात्:

“(3) जिन व्यक्तियों या उपभोक्ता अभिकरणों को, यदि वे राख आधारित उत्पादों के उपयोग के उद्देश्य से अन्य अभिकरणों के साथ पहले से जुड़े हुए हैं, ऐश ब्रिक्स या टाइल्स या सिंटेड ऐश ऐग्रीगेट या अन्य राख आधारित उत्पादों के विनिर्माताओं के द्वारा नोटिस दिया गया है तो उन्हें ऐश ब्रिक्स या टाइल्स या सिंटेड ऐश ऐग्रीगेट या अन्य राख आधारित उत्पादों के विनिर्माताओं को सूचित करना होगा, तदनुसार, यदि वे राख आधारित उत्पादों का उपयोग नहीं कर सकते या कम प्रमात्रा में उपयोग कर सकते हैं।”

2. यह अधिसूचना राजपत्र में प्रकाशन की तारीख से प्रवृत्त होगी।

[फा. सं. एचएसएम - 9/1/2019- एचएसएम]

नरेश पाल गंगवार, अपर सचिव

टिप्पण: मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग-II, खंड 3, उप-खंड (ii) सं. एस 5481(अ) तारीख 31 दिसम्बर, 2021 के द्वारा में प्रकाशित की गई।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 30th December, 2022

S.O. 6169(E).—Whereas, the Government of India, Ministry of Environment, Forest and Climate Change, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, issued a notification published in the Gazette of India, Extraordinary, Part II, Section 3, sub-section (ii) *vide* S.O.5481(E), dated the 31st December, 2021 (herein after referred to as the ash utilisation notification);

And whereas, requests have been received from Ministry of Power, thermal power plants and various stakeholders regarding implementation of provisions of the ash utilisation notification;

And whereas, it is expedient to make amendments to certain provisions of the said notification to have smooth transitioning in implementation of the ash utilisation notification;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with of sub-rule (1), (2) and (4) of rule (5) of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following amendments in the ash utilisation notification namely:-

In the ash utilisation notification,-

(1) in paragraph A,-

(i) in sub-paragraph (4), after the third proviso, the following shall be inserted, namely,-

“Provided also that new thermal power plants commissioned on or after the date of publication of this notification shall follow the first compliance cycle similar to the compliance cycle specified for thermal power plants having utilisation per cent. less than 60 per cent. as specified in the table.

Note: The utilisation targets as per the applicable compliance cycle shall commence from 1st April, 2022.”.

(ii) in sub- paragraph (5),-

(a) in the opening paragraph, for the words “the date of publication of this notification”, the figures, letters and word “1st April, 2022” shall be substituted;

(b) in the second proviso, -

(i) after the words “green belt or plantation”, the words, brackets, letters and figure “or solar power plant or wind power plant as per the guidelines issued by the Central Pollution Control Board (CPCB) as specified in sub-para (6)” shall be inserted,

(ii) the words, brackets and letters “Central Pollution Control Board (CPCB) or” shall be deleted,

(iii) for the words “a year”, the words “three years” shall be substituted,

(iv) for the words “the date of publication of this notification”, the figures, letters and word “1st April, 2022” shall be substituted.

(c) after the second proviso, the following proviso shall be inserted, namely:

“Provided that ash stored in all ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash as specified in sub-para (6) shall constitute the legacy ash and either to be reclaimed or stabilised or utilised.”.

(iii) for sub- paragraph (6), the following sub-para shall be substituted, namely,-

“(6) Any new as well as operational thermal power plant may be permitted operational ash pond or dyke for temporary storage of ash within an area of 0.1 hectare per Mega Watt (MW). Technical specifications of operational as well as stabilised and reclaimed ash ponds or dykes shall be as per the guidelines of the Central Pollution Control Board (CPCB) made in consultation with the Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the operational as well as stabilised and reclaimed ash pond or dyke on its safety, environment pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt, etc. and shall be put in place within three months from the date of publication of this notification:

Provided that up to two operational ash ponds or dykes for thermal power plants commissioned before 31st December, 2021, having installed capacity less than or equal to 1600 MW, and up to four operational ash ponds or dykes for thermal power plants having installed capacity more than 1600 MW, having multiple lagoons, within the specified area from the existing ash ponds or dykes, may be designated with clear demarcation along with coordinates, and shall inform to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 31st March, 2023:

Provided further that one ash pond or dyke shall be permitted in case of new thermal power plants or expansion of existing thermal power plants commissioned on or after 31st December, 2021, which shall inform the details of demarcation along with coordinates to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) within 3 months from the date of commissioning of thermal power plant or by 31st March, 2023, whichever is later:

Provided also that coal and lignite based thermal power plants shall not be allowed to further establish or designate any new operational ash pond or dyke:

Provided also that specification of 0.1 hectare per Mega Watt (MW) of an operational ash pond or dyke shall not be applicable for the thermal power plants commissioned before 03rd November, 2009.”.

(2) in paragraph B,-

(i) in sub- paragraph (1), for the words, figures and letters “within 300 kms”, the words, figures and letters “within a radius of 300 kms” shall be substituted,

(ii) in sub- paragraph (8), for the words “higher than the price of alternative products”, the words, brackets and letters “more than the price mentioned in the Schedule of Rates as specified by Central Public Works Department (CPWD) or concerned Public Works Department (PWD) or price of alternative products, if not mentioned in the Schedule of Rates.” shall be substituted.

(3) in paragraph -D, -

(i) for sub- paragraph (2), the following sub- paragraph shall be substituted, namely,-

“(2) Persons or user agencies who have been served notice by owner of thermal power plants, if they have already tied up with other agencies for the purpose of utilisation of ash, shall inform the thermal power plant accordingly, and if they cannot use any ash or may use reduced quantity.”.

(ii) after sub- paragraph (2), the following sub-para shall be inserted, namely,-

“(3) Persons or user agencies who have been served notice by manufacturers of ash bricks or tiles or sintered ash aggregate or other ash based products, if they have already tied up with other agencies for the purpose of utilisation of ash based products, shall inform the manufacturer of ash bricks or tiles or sintered ash aggregate or other ash based products, accordingly, and if they cannot use ash based products, or may use reduced quantity.”.

2. This notification shall come into force on the date of its publication in the Official Gazette.

[F. No. HSM-9/1/2019-HSM]

NARESH PAL GANGWAR, Addl. Secy.

Note : The principal notification was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii), dated the 31st December, 2021, *vide* number S.O.5481 (E), dated the 31st December, 2021.

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Annexure-III



सत्यमेव जयते

**GUIDELINES ON DESIGN, CONSTRUCTION, O&M
and
ANNUAL CERTIFICATION
of
COAL ASH PONDS**

Central Pollution Control Board

Central Electricity Authority

**Ministry of Environment, Forest
and Climate Change
Government of India**

**Ministry of Power
Government of India**

June 2023



**विद्युत मंत्रालय
MINISTRY OF
POWER**



Ministry of Environment, Forest
and Climate Change



भारत 2023 INDIA
सर्वेभ्यो बृहन्मव्यक्तम्
ONE EARTH - ONE FAMILY - ONE FUTURE



LIFE
Lifestyle for
Environment

Issued by:**Central Pollution Control Board**

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Disclaimer

These guidelines have been prepared solely for the benefit of thermal power plants in India. No liability is accepted with respect to its use. This disclaimer shall apply notwithstanding that these guidelines may be used by other persons for any application.

Acknowledgement

CPCB and CEA extends thanks to all the power utilities and the thermal power stations for furnishing the data and information for bringing out these guidelines on ash ponds and their annual certification.

We are grateful to the Chairperson-CEA, Chairperson-CPCB, Member (Hydro)- CEA and Member Secretary-CPCB for the valuable support and guidance in preparation of these guidelines.

Acknowledgements and thanks are extended to the following contributors:

Sh. C.K.L. Das, Chief Engineer-CD Division, CEA

Sh. Gulshan Raj, Chief Engineer-CD Division, CEA (22.9.2022 to 8.5.2023)

Sh. Anil Jain, Chief Engineer-CD Division, CEA (1.7.2022 to 25.9.2022)

for overall direction, content identification.

Sh. Anuj Kanwal, Director, CD Division, CEA (21.3.2022 to 09.11.2022)

for compilation and editing of the Guidelines.

Sh. Nazimuddin, Sc F & Head, IPC-II Division, CPCB

for valuable comments and co-ordination.

Sh. Amit Kumar, Director, CD Division, CEA

Ms. Manisha, Sr. Manager-NTPC posted in CEA

for first hand compilation of the basic material for the Guidelines and overall co-ordination.

घनश्याम प्रसाद
अध्यक्ष तथा पदेन सचिव भारत सरकार
GHANSHYAM PRASAD
Chairperson & Ex-officio Secretary
To the Government Of India



केन्द्रीय विद्युत प्राधिकरण

भारत सरकार
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FOREWORD

Indian coal fired thermal plants generates approximately 270.82 million metric tonnes of ash every year on an average from burning of coal. The utilization of ash has increased from about 9.63 % in 1996-97 to a level of 95.95% in 2021-22 on all India basis.

MoEF&CC estimates that ash dumps occupy nearly 40,000 hectares of land. The ash ponds are metres high and are prone to leaking and breaching, posing serious ecological and public security dangers.

The Ministry of Environment & Forests and Climate Change (MoEF&CC) has issued Notifications on ash utilization dated 31st December 2021 and its amendment dated 30th December, 2022 which supersedes all the earlier notifications. The environmental norms aspire to use the ash to 100 percent. Given the gravity of the coal ash crisis in India, regulating ash ponds with standard guidelines was urgently required and the same was also highlighted in the notification.

I wish to express my appreciation to the officers and staff of Civil Design Division, CEA who have taken initiative and have compiled this guidelines taking inputs from the power utilities. I believe that this guideline would be useful for all the stakeholders and shall help in better ash management, design and construction and aid in country's climate goal.

(Ghanshyam Prasad)

तन्मय कुमार, भा.प्र.से.
अध्यक्ष

Tanmay Kumar, I. A. S.
Chairman



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CENTRAL POLLUTION CONTROL BOARD
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

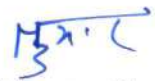


Acknowledgement

Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India has issued Notification No. S.O. 5481 (E) dated 31 December, 2021 (and amended it by Notification No. S.O. 6169 (E) dated 30th December, 2022) that mandates coal and lignite thermal power plants in the country to achieve 100% ash utilization in every three year cycles and further mandates utilisation of legacy ash in ten years from its implementation date 01 April 2022 provided the un-operational ash ponds are not stabilised and reclaimed within three years.

Further, in order to prevent ash spilling accidents and breaches of ash ponds embankments/dykes the Notification prescribes in Para A(6) that 'the technical specifications of operational as well as stabilized and reclaimed ash ponds or dykes shall be as per the guidelines of the Central Pollution Control Board (CPCB) made in consultation with the Central Electricity Authority (CEA)' and that 'these guidelines shall also lay down a procedure for annual certification of the operational as well as stabilized and reclaimed ash pond or dyke on its safety, environment pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt, etc.'

I would like to place on record my appreciation of the efforts made by the officers of Civil Design Division of CEA and IPC-II Division of CPCB in preparation of these guidelines as per Para A(6) of the Notification and extend by thanks to them and also their senior officers who guided them in this task.


(Tanmay Kumar)

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M. A. K. P. Singh
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PREFACE

With great pleasure and pride I present the comprehensive guidelines on the design, construction, maintenance and operation of pond ash. These guidelines have been developed with an objective to provide engineers, practitioners and stakeholders a valuable resource that will aid them in the efficient and sustainable management of pond ash.

Management of ash at coal / lignite based Thermal Power Stations in the country is a challenging task, in view of large quantity of ash being generated and further to meet the target of achieving 100% utilization of Ash in a time bound manner, as prescribed in MoEF&CC Notification of 31st December, 2021 and its amendment dated 30th December, 2022. The land acquisition for creating ash dykes for ash disposal facilities at thermal power plants is becoming difficult. Disposal of ash, if not managed well, will become serious environmental issue.

I am confident that these guidelines will also be useful to all the stakeholders involved in ash management in the country for planning, design, construction as well as operation and maintenance the ash pond.

I would also like to place on record my appreciation of the efforts made by the officers and staff of Civil Design Division, CEA. Any suggestions/views as well as intimations for any unintended errors observed in this document may kindly be sent to:

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C.K.L Das
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Acknowledgement

Pond ash, a by-product of coal combustion, has gained increasing recognition as a valuable material in various engineering applications. This document would serve as a roadmap for professionals involved in the design, construction, maintenance, and operation of projects involving ash.

The development of these guidelines has been a collaborative effort, bringing together a diverse team of experts from within our organization and beyond. I would like to extend my appreciation to all the officers & staff of CD Division who have contributed to these guidelines.

Thanks are also extended to all the Power Utilities and the Thermal Power Stations for furnishing the data and information for bringing out these guidelines on ash ponds and its annual certification.

I am thankful to the Chairperson-CEA, Chairperson-CPCB, Member (Hydro), CEA and Member Secretary, CPCB for their support, worthy suggestions and guidance in the preparation of these guidelines.

In particular, acknowledgements and thanks are extended to the following contributors:

- Sh. Gulshan Raj**, Chief Engineer-CD Division, CEA
- Sh. Anil Jain**, Chief Engineer-CD Division, CEA
- Sh. Anuj Kanwal**, Director, CD Division, CEA
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(C.K.L. DAS)

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Useful definitions/Explanation

Ash: All the coal or lignite ash generated at TPP, such as ESP Ash (Electro Static Precipitator), dry Fly Ash, Bottom Ash (BA), Pond Ash and Mound Ash for the purpose of utilization.

Fly Ash: Ash Extracted from flue gases by any suitable process.

Bottom Ash: Ash collected separately at the bottom of the boiler furnace.

Pond Ash: Fly ash or bottom ash or both mixed in any proportion and conveyed in slurry / paste form and deposited in pond / lagoon.

Mound Ash: Fly ash or bottom ash or both mixed in any proportion and conveyed in dry form and deposited dry.

Legacy Ash: The ash stored in all the ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash before 1st April 2022.

Ash Dyke: Ash Dyke/Ash ponds are well engineered structures used for storage of bottom ash and fly Ash generated at Thermal Power Stations. A single ash dyke/ash pond may contain multiple lagoons for ash storage based on operational requirements, and other associate structures such as Overflow lagoons/Silting basins etc.

CHAPTER 1

INTRODUCTION

1. General

The combustion of coal in Thermal Power Plant (TPP) produces Coal Combustion Residues (CCRs) which is a collective term referring to fly ash, bottom ash, boiler slag, and fluidized bed combustion ash. After ignition at high temperature the coal resolve in to different solid fractions. Most of the fine dust entrained by the flue gases leaving the boiler and collected by fabric filter or electrostatic precipitator is known as **precipitated fly Ash (PFA)**, which results 80% of the total coal combustion. The rest of 20% particle, including unburned carbon settle to the bottom of the boiler called **Bottom Ash (BA)**. Because of economic viability, thermal power stations most widely dispose both precipitated fly ash and bottom ash together as a slurry to the pond in which it stored for a longer period. As the reuse potential of ash has been increasing during recent years, segregated storage of fly ash and bottom ash is likely to gain popularity among power plant considering better economical returns from sale of fly ash.

According to the notification of Union Ministry of Environment, Forest & Climate Change (MoEF&CC), Ash means all the coal or lignite ash generated at TPP, such as ESP Ash (Electro Static Precipitator), dry Fly Ash, Bottom Ash (BA), Pond Ash and Mound Ash fort the purpose of utilization.

Schematic view of a thermal plant indicating the process of generation of fly ash and bottom ash is shown in the following figure 1.

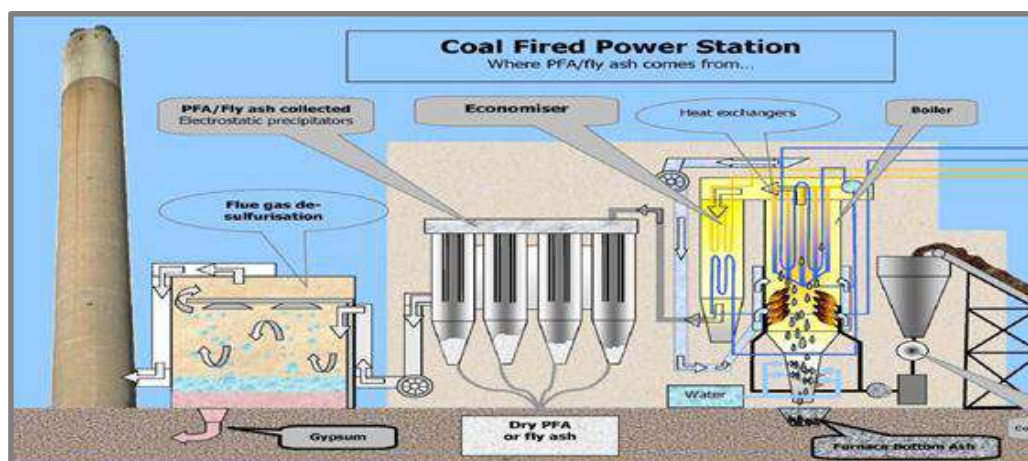


Fig 1. Schematic view of a thermal plant indicating the process of generation of fly ash and bottom ash

Presently in India, more than 40,000 hectares of land is occupied for storage of this huge quantity of ash. Over a period of time, the fly ash disposal can cause problems like large surface setting lagoons for storage, infiltration of transport of water from deposit to soil, dust carryover in wind from dried lagoons and leads ecological and environmental imbalances if proper safeguards are not taken in their design, construction, operation and maintenance.

Environmental pollution by the coal based thermal power plants are cited to be the major source of pollution affecting the general aesthetics of environment in terms of land use, health hazardous and air, soil and water in particular and thus leads environmental dangers. Safe disposal and gainful utilization are the prime concerns to safe guard the interest of environmental system

In India about 73% of the total electrical energy is generated from coal-based source. Annually about 271 million tons of Ash as solid waste/ by product being released during the process of generation of electricity by combustion of pulverized bituminous, sub bituminous, and lignite coal. Indian coal has low calorific value (3500 Kcal/kg), and results 30-60% of ash content. India's major source of power, even in the near future, is going to remain coal based thermal power plants hence, Ash disposal would continue to be a subject of priority since environmental issues holds greater importance in this century.

Though it has been proven to be a resource material for various uses such as earth material, ingredient for cement manufacture, raw material for manufacture of bricks, tiles and aggregates, the demand for ash may not at all time match with the supply of ash, which is produced 24x7, as the power plant operates. This requires a suitable system for storage of ash till its user is found and the economic use of the ash is explored.

Union Ministry of Environment, Forest and Climate Change (MoEF&CC) of India has issued notifications to address utilization of ash for various purposes.

1.1 Physical and Chemical Properties of Fly Ash

Physical, chemical and mineralogical properties of Fly Ash in general varies as they are influenced by coal source / quality, combustion process, degree of weathering, particle size and age of the ash. In addition, the particle size of ash at different locations and depth in the ash pond distinctly based on the length and width of the pond, flow rate, existing natural slope *etc.*

As per the ASTM standards India bituminous and sub bituminous coal results class F ash and lignite coal ash is class C type having high degree of self-hardening capacity.

Particle size of Ash varies widely from 0.1 μm to 900 μm with specific surface area greater than 0.1038 m^2 /gm. Fly Ash is a non-degradable, non-perishable, inert material. Typical properties of Ash are represented in table-1 below:

Table 1: Typical Properties of Fly Ash*

Engineering Properties	Range	
	Bottom Ash	PFA(pulverized fly ash)
Grain size,%		
Clay	0	0
Silt	15-40	60-90
Sand	50-80	05-20
Gravel	0	0
Specific Gravity	1.58-2.24	1.58-2.2
Maximum Dry Density(gm/cc)	1.004	1.037
Optimum Moisture Content.%	39.4	60.6
Effective Cohesion(Kg/cm ²)	0	0
Effective angle of shearing resistance degree	42	34
Coefficient of Permeability (cm/sec)	10 ⁻² to 10 ⁻⁴	10 ⁻⁵ to 10 ⁻⁸

Chemical constituents	Range (%)	
	Bottom Ash	PFA
Silica (SiO ₂)	70.0	73.2
Alumina(Al ₂ O ₃)	24.4	21.3
Iron Oxide (Fe ₂ O ₃)	2.50	2.56
Calcium Oxide (CaO)	0.50	0.60
Magnesium Oxide (MgO)	1.1	1.0
Sulphur Oxide(SO ₃)	0.5	0.5

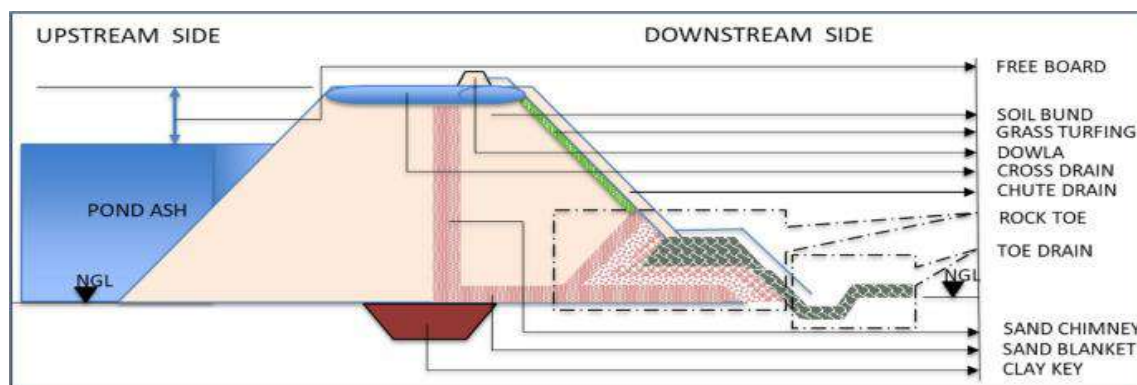
Note The values given in the table are tentative values only for guidance exact values shall be as per actual field tests.*

1.2 Ash Pond/ Dykes

Ash Dykes Ash Dyke/Ash ponds are well engineered structures used for storage of bottom ash and fly Ash generated at Thermal Power Stations. A single ash dyke/ash pond may contain multiple lagoons for ash storage based on operational requirements, and other associate structures such as Overflow lagoons/Silting basins etc. At the disposal areas, storage space is created by constructing ash dyke embankments all around, within which ash particles will be allowed to settle and the decanted water is allowed to escape through outlet structure.

The dyke around the ash disposal area is constructed in multi-stage. Initially a starter dyke is constructed utilizing earth excavated from the ash disposal area itself and when it is filled with discharged ash the height of ash dyke embankment is raised. Power plants in India have

been generally using ash as the main construction material for subsequent dyke raisings, over the ash dyke to reduce cost. Over the ash core in raising dyke, a layer of earth (generally >500mm thick) is laid to protect ash from erosion due to wind and water since ash is a light material compared to earth. For the purpose of design and construction of embankment with ash, and the principles of Soil Mechanics are applied. Typical section of ash dyke is shown below in figure 2



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1.3 Ministry of Environment and Forests and Climate Change (MoEF&CC) Notifications

Fly Ash Mission, a Technology Project in Mission Mode of Government of India, was commissioned during 1994 as a joint activity of Department of Science & Technology (DST), Ministry of Power (MoP) and Ministry of Environment and Forests and Climate Change (MoEF&CC) with Department of Science & Technology as nodal agency. The Fly Ash Mission was set up to promote research in the area of fly ash utilization so that fly ash could be gainfully utilized instead of its disposal in ash ponds. Ministry of Environment & Forests and Climate Change, Government of India issued 1st Notification on Fly Ash Utilization in September 1999, which was subsequently amended in 2003, 2009 and 2016 stipulating targets for fly ash utilization for Thermal Power Stations and use of fly ash by construction agencies within a prescribed radius of any thermal power station.

Ministry of Environment and Forests and Climate Change (MoEF&CC) vide Notification No. S.O. 5481 (E) dated 31st December, 2021, issued a notification on Ash utilization by coal and lignite thermal power plants which shall be applicable for Financial Year 2022-23 onwards. Further an amendment to this notification was issued vide Notification No. S.O. 6169 (E) dated 30th December, 2022. The notification as published and its amendment is placed at Annexure-I, II for reference.

The notification mandates 100% ash utilization. The relevant clauses of the notification after incorporation of amendments are reproduced here for reference:

A(4) Every coal or lignite based thermal power plant shall be responsible to utilise 100 per cent ash (fly ash and bottom ash) generated during that year, however, in no case shall utilisation fall below 80 per cent in any year, and the thermal power plant shall achieve average ash utilisation of 100 per cent in a three years cycle:

Provided that the three years cycle applicable for the first time is extendable by one year for the thermal power plants where ash utilisation is in the range of 60-80 per cent, and two years where ash utilisation is below 60 per cent and for the purpose of calculation of percentage of ash utilisation, the percentage quantity of utilisation in the year 2021- 2022 shall be taken into account as per the table below:

<i>Utilisation percentages of thermal power plants</i>	<i>First compliance Cycle to meet 100 per cent utilisation</i>	<i>Second compliance cycle onwards, to meet 100 per cent utilisation</i>
<i>>80 per cent</i>	<i>3 years</i>	<i>3 years</i>
<i>60-80 per cent</i>	<i>4 years</i>	<i>3 years</i>
<i><60 per cent</i>	<i>5 years</i>	<i>3 years</i>

Provided further that the minimum utilization percentage of 80 per cent shall not be applicable to the first year and first two years of the first compliance cycle for the thermal power plants under the utilization category of 60-80 per cent and <60 per cent, respectively.

Provided also that 20 per cent of ash generated in the final year of compliance cycle may be carried forward to the next cycle which shall be utilized in the next three years cycle along with the ash generated during that cycle.

Provided also that new thermal power plants commissioned on or after the date of publication of this notification shall follow the first compliance cycle similar to the compliance cycle specified for thermal power plants having utilization per cent less than 60 per cent. as specified in the table.

Note: The utilization targets as per the applicable compliance cycle shall commence from 1st April, 2022.

(5) The unutilised accumulated ash i.e. legacy ash, which is stored before the publication of this notification shall be utilised progressively by the thermal power plants in such a manner that the utilization of legacy ash shall be completed fully within ten years from 1st April, 2022 and this will be over and above the utilisation targets prescribed for ash generation through current operations of that particular year:

Provided that the minimum quantity of legacy ash in percentages as mentioned below shall be utilised during the corresponding year and the minimum quantity of legacy ash is to be calculated based on the annual ash generation as per installed capacity of thermal power plant.

<i>Year from date of publication</i>	<i>1st</i>	<i>2nd</i>	<i>3rd -10th</i>
<i>Utilisation of legacy ash (in percentage of Annual ash)</i>	<i>At least 20 per cent</i>	<i>At least 35 per cent</i>	<i>At least 50 per cent</i>

Provided further that the legacy ash utilisation shall not be required where ash pond or dyke has stabilised and the reclamation has taken place with greenbelt or plantation or solar power plant or wind power plant as per the guidelines issued by the Central Pollution Control Board (CPCB) as specified in sub-para (6) and the concerned State Pollution Control Board shall certify in this regard. Stabilization and reclamation of an ash pond or dyke including certification by the State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be carried out within a three years from 1st April, 2022. The ash remaining in all other ash ponds or dykes shall be utilised in progressive manner as per the above mentioned timelines.

Note: The obligations under sub-paragraph (4) and (5) above for achieving the ash utilisation targets shall be applicable from 1st April, 2022.

Provided that ash stored in all ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash as specified in sub-para (6) shall constitute the legacy ash and either to be reclaimed or stabilised or utilised.

(6) Any new as well as operational thermal power plant may be permitted operational ash pond or dyke for temporary storage of ash within an area of 0.1 hectare per Mega Watt (MW). Technical specifications of operational as well as stabilized and reclaimed ash ponds or dykes shall be as per the guidelines of the Central Pollution Control Board (CPCB) made in

consultation with the Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the operational as well as stabilized and reclaimed ash pond or dyke on its safety, environment pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt, etc. and shall be put in place within three months from the date of publication of this notification:

Provided that up to two operational ash ponds or dykes for thermal power plants commissioned before 31st December, 2021, having installed capacity less than or equal to 1600 MW, and up to four operational ash ponds or dykes for thermal power plants having installed capacity more than 1600 MW, having multiple lagoons, within the specified area from the existing ash ponds or dykes, may be designated with clear demarcation along with coordinates, and shall inform to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 31st March, 2023:

Provided further that one ash pond or dyke shall be permitted in case of new thermal power plants or expansion of existing thermal power plants commissioned on or after 31st December, 2021, which shall inform the details of demarcation along with coordinates to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) within 3 months from the date of commissioning of thermal power plant or by 31st March, 2023, whichever is later Provided also that coal and lignite based thermal power plants shall not be allowed to further establish or designate any new operational ash pond or dyke:

Provided also that specification of 0.1 hectare per Mega Watt (MW) of an operational ash pond or dyke shall not be applicable for the thermal power plants commissioned before 03rd November, 2009.

The scope of guidelines shall cover the siting/location/planning, technical specifications /design & engineering standards disposal system regulation and procedure for maintenance and annual certification to ensure that the ash storage shall be safe and ash utilization shall fulfill the requirement of the plant and comply with the MoEF&CC norms. The factors affecting the environment i.e. land for ash disposal, pollution on Groundwater and surface water bodies, fugitive dust emission and failure/breach of ash dyke.

SECTION-A
(Siting, Design and Engineering Standard for
New Ash Ponds)

CHAPTER 2

ASH CONVEYANCE FROM PLANT TO ASH POND

2. Disposal of Fly ash

The generated ash is disposed of in well designed, constructed and maintained ash ponds generally in wet slurry form. At specific location, compared to wet ash disposal system, dry ash disposal system may also be suitable. In new projects, due to inherent benefit of the system, high concentration slurry disposal (HCSD) system is being preferred to reduce land and water requirements as well as to prevent contamination of ground water.

Basically, thermally power projects are to be provided with systems for 100% dry ash extraction and storage and supply of ash to various entrepreneurs for promoting ash utilization. As per MOEF&CC notification clause no A (8), Each TPP shall install dedicated dry Fly Ash silos for storage of at least 16 hours of ash based on the installed capacity having separate access roads so as to ease the delivery of ash.

The unutilized ash may be disposed-off using mainly three types of ash disposal systems:

- a. Wet Disposal in lean slurry form into ash dyke/ mine voids
- b. Dry Disposal in Ash Mound form
- c. Wet Disposal in High Concentrated Slurry form into ash dykes

The details of all the above systems are described in the following sections.

2.1 Wet Disposal in Lean Slurry Form:

This system is widely used in India. The system consists of extraction of fly ash from Electro Static Precipitator (ESP), conveying to fly ash silos and slurry mixing tanks and pumping slurry to disposal area using centrifugal pumps. A free-flowing lean ash slurry is made with water, which is pumped into storage areas. Ash disposal pond/lagoons are formed by constructing dykes (embankments) made of earth / ash or using natural depressions such as mine voids and the slurry is discharged into the lagoons from pipelines. Ash particles settle in the lagoons and clear water above the ash surface is decanted. Decanted water is taken out through water escape structure and recirculated to plant through an

Ash Water Recirculation System (AWRS) for reuse in ash disposal system. A photograph of a typical lean slurry is shown in figure 3.



Figure 3: Lean Slurry Disposal System

Fresh deposits of ash are in the form of marsh. However, over a period of time, especially when overlain by several layers, these ash deposits get consolidated into high density layers with little or no free water. This system has following limitations:

1. Due to high velocity wear and tear of pipes is more
2. The dykes are designed as dams and are always filled with slurry, with a risk of breach/seepage it needs continuous operation and maintenance.

2.2 Wet Disposal in High Concentration Slurry Form:

This is an advance system of wet disposal with fly ash concentration of 60% to 70% of ash by weight. Due to high concentration of ash, it is pumped through high pressure slurry pumps to disposal area and needs steel pipes for conveying slurry. Flexible pipes are used at disposal area. Centrifugal pumps have also been tried for conveying high concentration slurry to long distance in one plant and reported to be working satisfactorily.

High concentration slurry is homogeneous in nature which ensures that no water is released when slurry is discharged in the ash disposal area. Dense, compact deposit is formed with rapid drying. High concentration slurry attains relatively steep slopes at the point of disposal. A photograph of a typical high concentration system is shown in Figure 4.



Figure 4: High Concentration Slurry Flowing on Slopes which dries out by the time it travels 30-40 m from the source

High Concentration Slurry Disposal (HCSD) system has the following advantages and limitations.

Advantages of High Concentration Slurry Disposal (HCSD):

1. HCSD reduces water and land requirement, it is ecofriendly, no leachate discharge
2. Low water consumption with respect to lean slurry disposal and no release of free water at disposal
3. As the slurry travels at slow speed, wear and tear of pipes is less
4. High concentration slurry is easy to dig and can be used for various purposes at a later stage
5. Low maintenance of ash dyke
6. Danger of breaching the dyke is negligible.

Limitations of High Concentration Slurry Disposal (HCSD):

1. Ash pipes often get choked due to high concentration slurry
2. Seamless steel pipes for conveying HC slurry are required.
3. High concentration slurry disposal requires high pressures.

2.3 Dry Ash Disposal System:

This system is entirely different from the wet disposal system. In the dry ash disposal system, furnace bottom ash (FBA) and pulverized fly ash (PFA) are transported in moistened form from Hydro bins and Silos respectively to ash mound site on fixed belt conveyors in enclosed gantries. In the ash mound area ash is disposed of by various types of equipment like fixed, extendable, shift able and mobile belt conveyors, a crawler mounted boom spreader, a crawler mounted bucket wheel reclaimer and a variety of wheeled and crawler mounted mobile equipment. At present, it is being used at only one station – National Capital Thermal Power Station at Dadri.

For surface stabilization and dust suppression at the mound, a number of measures are applied depending upon the nature of surface (flat, finished slope or natural ash dump surface), such as surface compaction & landscaping, sprinkling of water and polymers, spreading of cut grass and vegetation by growing grass, shrubs & trees. As the mound construction proceeds and finished slopes are available, the same are covered with grass & plantation. It is proposed to cover the entire ash mound area by plantation. Photographs of dry ash disposal system are shown in following Figure 5,6.



Figure 5 : Dry Ash Mound at NCTPS, Dadri (Working Front)



Figure 6: Dry Ash Mound at NCTPS, Dadri (After Stabilization and Plantation)

Dry ash Disposal has several advantages over the above two systems:

1. Less land Requirement
2. Less water Requirement
3. Less risk of Ground Water Pollution
4. Progressive restoration of ash disposal site as useful land in form of Park

However, it has certain constraints and limitations too, such as:

1. High maintenance Cost.
2. Dependency on weather/climate conditions. Difficult to operate during rains
3. Constraints of distance. It is preferred if disposal area is near to plant

2.4 Recommended system for conveyance of ash from plant to ash pond:

1. New plants shall use high concentration slurry disposal system for ash ponds.
2. The Existing plants shall carry out feasibility study to switch over to high concentration slurry disposal system and submit the report and time bound action plan for construction to SPCBs.
3. In case of ash mounds, dry ash disposal system which is a requirement of the process shall be used.

CHAPTER 3

PLANNING OF ASH POND

3. General

Coal ash is produced by coal-based thermal power plants (TPPs) for power generation. There are two types of ash produced by TPPs, i.e. fly ash (80%) and bottom ash (20%). The fly ash is collected by electrostatic precipitators from the flue gases of power plants, and the bottom ash is collected from the bottom of the boilers. The ash generated by TPPs is generally disposed by one of following two ways:

- (1) **Dry Disposal:** Ash collected in the ESP Hoppers is removed in dry form by using either vacuum system or pressure system and is conveyed to a buffer hopper. The ash is transported in dry form by pneumatic conveying to the storage site. Ash is spread in layers which are amenable to adequate compaction. To facilitate compaction additional water is added into the ash.
- (2) **Wet Disposal:** Fly and bottom ashes are mixed with suitable proportion of water and pumped out from the TPPs as slurry in the ash pond. It is the most commonly used as it is less expensive ash management practice worldwide. The mixed fly and bottom ashes in ash pond is called pond ash.

3.1 Ash Pond

Ash ponds are engineered dam and dyke facilities used for storage of bottom ash and Pulverized Fly Ash (PFA) generated at Thermal Power Stations. Ash ponds are also used to enable water to separate from the fly ash slurry. Water from the Ash ponds is recycled back, reducing the use of fresh water. Ash ponds use gravity to settle out large particulates (measured as total suspended solids) from the thermal power plant.

3.2 Parameters for Design and Construction of Ash Pond

3.2.1 Quantity of Ash

The quantity of Ash produced in a power plant will depend upon the ash content in the coal and total quantity of coal used by thermal power stations.

3.2.2 Storage Volume

In-situ dry density of pond ash varies from 0.78 to 1.05 gm /cc, specific gravity refer table 1 chapter-1 page 4 of the guidelines. In absence of the site specific data, average density of 1.00 tons/m³ may be taken for storage volume calculations in wet disposal system. The design life of the ash pond varies from plant to plant and based on site conditions and ash utilization rate in view of latest notification for ash utilization.

3.2.2.1 Lagoon Size

A minimum area shall be provided for each of the lagoons, depending upon the discharge rate of slurry, the specific gravity of ash particles, and the size of smallest particles of ash to ensure proper sedimentation of ash particles.

In the absence of data, the smallest size of ash particles may be assumed as 0.002 mm, unless reliable ash test results are available for that project. Particles settling velocities are inversely proportional to the viscosity of water which will vary with temperature and for sizing calculation, the value at 5°C may be considered.

3.3 Land Requirement

As per clause no A(6) of MOEF&CC notification (Dec,2021) and its amendment dated 30th December,2022- *Any new as well as operational thermal power plant may be permitted operational ash pond or dyke for temporary storage of ash within an area of 0.1 hectare per Mega Watt (MW)*. However, from storage point of view the area required could be less considering ash utilization as per MOEF notification.

3.4 Height of Ash Dyke

The ash dyke shall be designed for ultimate heights (starter dyke and subsequent raisings) based on ground topography, foundation soil, availability of construction materials etc. The minimum height of ash dyke is finalized based on natural ground level in ash pond area, High Flood Level (HFL), ash water recirculation requirements and free board requirements as per IS code. In general, starter dyke height of the storage lagoon is made in the range of 10m-15m. The ash dyke embankments are to be analyzed and designed as water retaining structures conforming to IS: 7894, IS:12169 & IS:9429.

The initial starter dyke shall be constructed using earth in new project. In case of expansion projects ash may be used for starter

dyke construction. In such cases expert advice shall be obtained for taking precautions design. However, below HFL, ash shall not be used as fill. The raising of ash dyke may be done using ash with a minimum 500 mm thick earth cover subject to satisfying the stability criteria as laid down in IS 7894. However, the thickness of earth cover may be increased based on expert advice depending upon site and geology, rainfall etc. Internal drainage shall be as indicated in the construction drawing.

3.5 Site Selection:

The main aspects to be considered are the distance to the ash dyke, properties of coal, topographical conditions, geological locations, meteorological conditions etc. To protect the environment due to ash disposal various site-specific studies like topographical survey, earlier land use map, drainage pattern, environmental impact assessment, archives, meteorological data, hydrological studies, geotechnical investigations are carried out at the proposed site.

Recommended siting conditions:

- i) Site should be selected to ensure that the base can be located no less than 5 ft above the upper limit of the uppermost aquifer, or it must be demonstrated that there will not be any hydraulic connection between the base and the uppermost aquifer due to normal fluctuations in groundwater elevations.
- ii) The ash ponds should be located at least 500 m away from the HFL/ FRL of the Rivers/ Reservoirs
- iii) Site should not be located in wetland.
- iv) Site should not be located within 60 m of the outermost damage zone of a fault that had displacement in Holocene time, unless it is demonstrated that an alternative setback distance of less than 60 meters (200 feet) will prevent damage to the structural integrity.
- v) Site should not be located in seismic impact zones unless it is demonstrated that all structural components including liners, Ash Water collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.
- vi) Site should not be located in an unstable area unless it is demonstrated that good engineering practices have been incorporated into the design to ensure that the integrity of the structural components will not be disrupted.

3.6 Configuration

The scheme for ash disposal generally envisages two lagoons for bottom ash (BA) with one common over flow lagoon (OFL) and one lagoon for fly ash (FA) with one silting basin. The silting basin is to be used for collecting excess rainwater to ensure dyke safety. The dykes are planned with various numbers of raisings depending on maximum height of starter dyke, capacity requirement and foundation conditions. Well type water escape structure with flexible opening are envisaged for decanting water from storage lagoon to over flow lagoon for recirculation through Ash water recirculation system (AWRS). Spillways shall also be envisaged for discharging excess rainwater from storage lagoons/OFL. BA Storage lagoon and OFL are necessarily to be provided with impervious liner using bentonite-blended soil or equivalent to ensure no ground water contamination.

The topography of the ash dyke area is undulating terrain with varying levels. The total length of the starter dyke may be in few kilometers. Typical configuration of ash pond is shown in following figures 7 and 8.

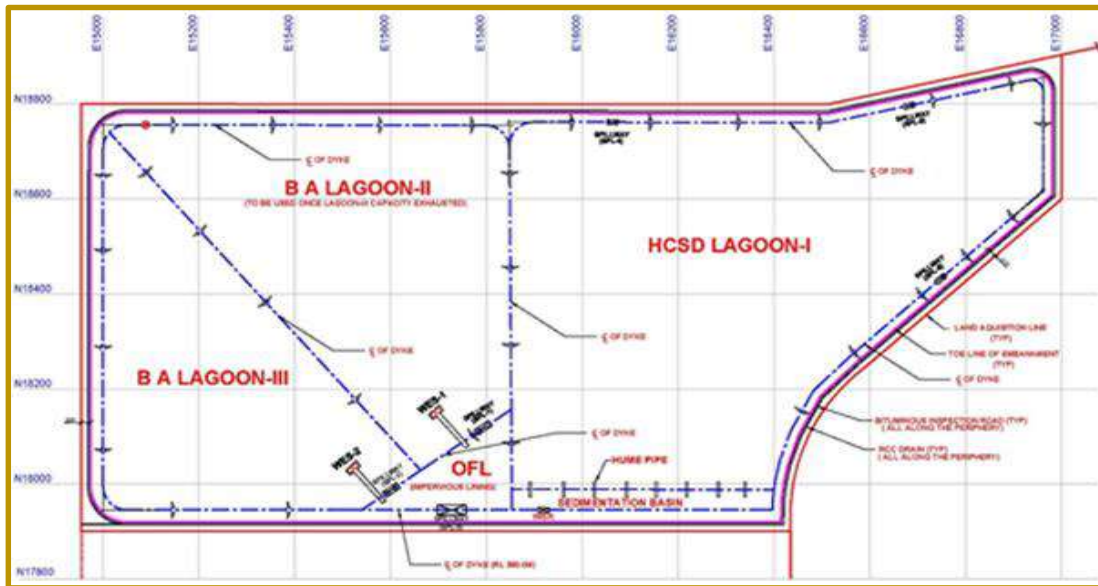


Figure 7: Typical layout of ash pond

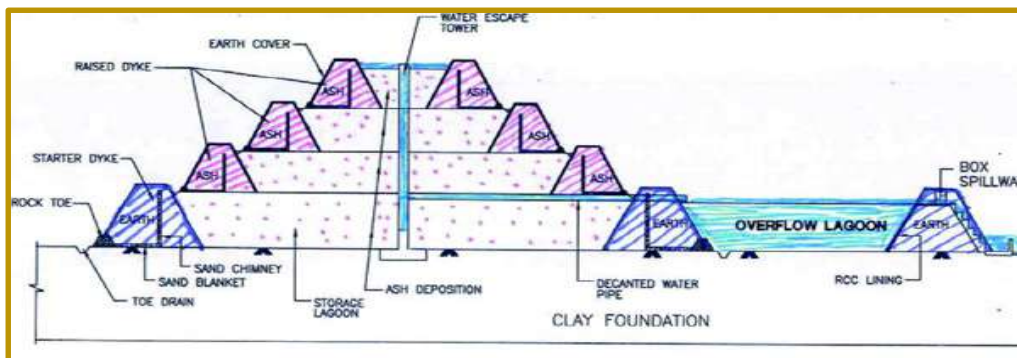


Figure 8: Typ Section of storage lagoon and OFL

3.7 Type of Embankment

From the point of view of material of fill, an earthen embankment can be classified as:

- I. Homogeneous Embankment
- II. Zoned Embankment
- III. Earth and Rock Fill Embankment

3.7.1 Homogeneous Embankment

A homogeneous embankment is one which consists of practically uniform materials throughout. This type of embankment is suitable where the readily available soils show little variation in permeability or soils of contrasting permeability are available only in minor quantities.

For embankment in ash disposal areas, soil excavated from the disposal area itself shall be made use of, as far as possible. Within the limited areas of lagoons in the order of 300 to 500 acres, not much variation is expected in the soil characteristics, in the top one to two metre depth from surface. Hence homogeneous embankment can be constructed in general. Typical homogeneous ash dyke section is shown in following figure 9.

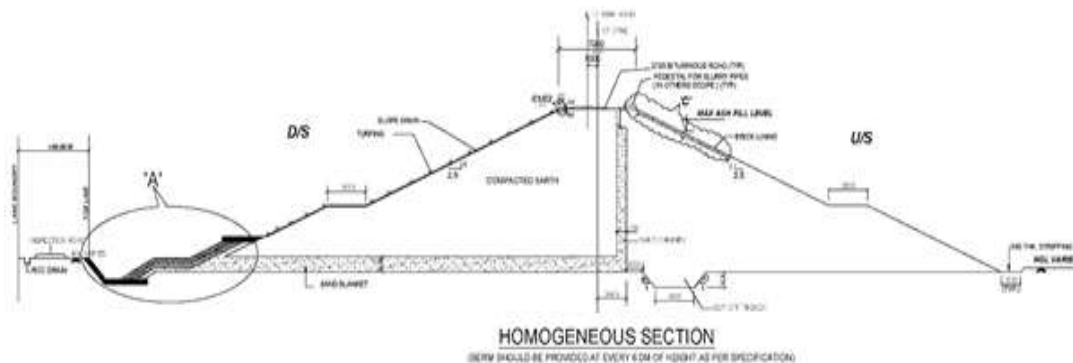


Fig 9. Typical homogeneous ash dyke section

3.7.2 Zoned embankment

A zoned embankment consists essentially of an inner or enclosed impervious zone supported by two or more outer zones of relatively pervious materials. Thus the scheme of zoning may divide the dyke into three or more zones, with the supporting zones increasing in

coarseness of particle size and perviousness towards the outer slope. For this type of embankment, it is essential that materials of different size ranges should be available either in different borrow areas or at different levels in the same borrow area.

For zoned embankments, materials of contrasting permeability will have to be brought from outside in large quantities which may be uneconomical and result in loss of additional storage volume which could have been obtained with excavation of material from within the ash disposal areas. Typical zoned ash dyke section is shown in following figures 10.

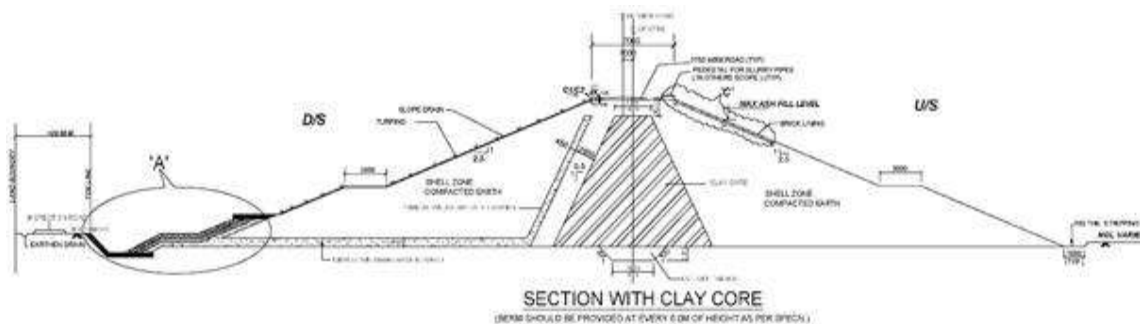


Fig 10. Typical zoned ash dyke section

3.7.3 Earth and Rock Fill Embankment

An earth and rock fill embankment consist of an earthen embankment “core “covered with large rock fill on the upstream or downstream slope, or on both. The earth-fill portion of the embankment may be zoned with two or more layers of soil or by graded filter layer. The selection of rockfill is governed by the availability of material and consideration of economy and structural stability. This configuration is normally avoided unless good construction soil is not readily available at the ash disposal site.

3.8 Over Flow Lagoons (OFL)

Over flow lagoons are provided with overflow type spillway with stilling basin. The capacity of overflow spillway is decided based on the water used in making slurry and flow generated by rainfall over the pond area.

3.9 Water Escape Structure (WES)

Construction of well type Water Escape Structure (WES) in each bottom ash lagoon with intermediate openings with provision of closing when ash level rises opening is provided for taking out the decanted water from storage lagoon to overflow lagoon for recirculation through AWRS pump house. The flexible opening provided in the WES wells would be used to

maintain optimum water cover over the deposited ash in the lagoon under charge to prevent any fugitive dust emission from storage lagoon.

Any pipe embedment inside the dyke body is a vulnerable point from the dyke safety point of view and extreme care shall be taken. Preferably a single pipe shall be provided in case of new construction of Ash dyke. However the actual requirement of number of pipes shall be as per detailed design. Cut off collar and diaphragm, filter may also be provided in the pipe embedment inside the dyke body.

Draw off pipes shall be provided from the water escape wells such that their outlet level is 0.25 m above the maximum water level in the overflow lagoon. If the pipes are to be kept above ground level, suitable earthen/ash embankment shall be provided along the pipe routed to support the pipes. The size of well/wells shall be sufficient to also draw out the rainwater collected within the ash pond in addition to the decanted water from the ash slurry.

Approach bridges/bunds shall be provided for access to wells from the dyke tops. A typical sketch of WES is shown below.

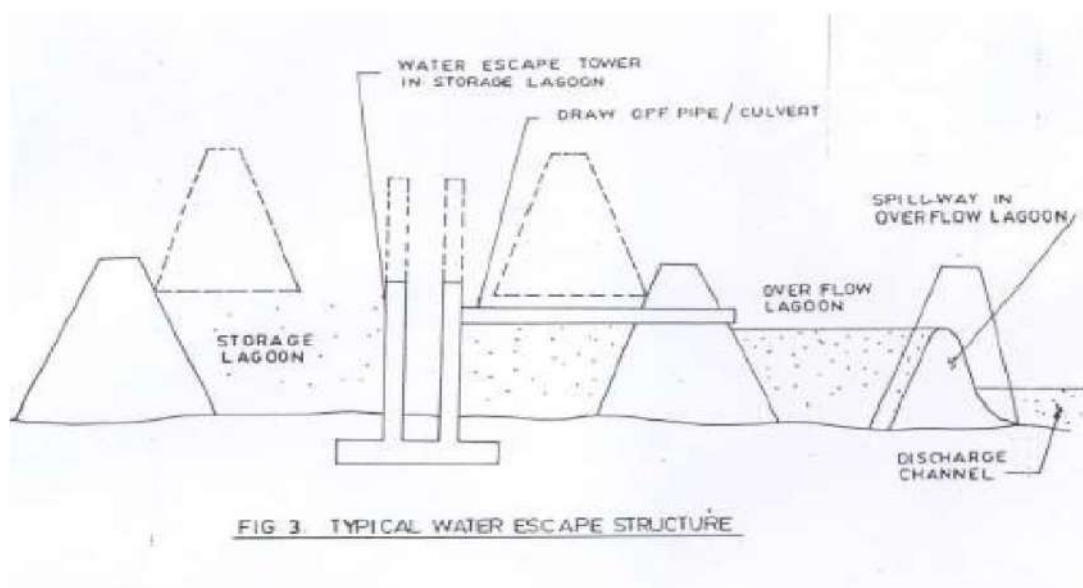


Fig 11: Typical Water Escape Structure (WES)

3.10 Requirement of Toe drain/ Seepage water pump house

National Green Tribunal (NGT) & State Pollution Control Boards (SPCBs) have issued directive for zero discharge from Plant and prohibiting any discharge of liquid effluent from ash dyke into the river or any surface water body.

Accordingly, the toe drain water from the ash dykes is not to be discharged into the nearest river/ water body and needs to be recirculated. In recent projects, the above aspect is taken care during the engineering of the AHS/ Ash dyke package where in toe drain water is envisaged to be pumped back into ash dyke for recirculation.

3.11 Requirement of inspection road for dyke and ash/ash water pipe corridor

In view of heavy and frequent movement of vehicles on ash dyke, the following needs to be considered:

- 1) Inspection/ Service and dyke top road all along the periphery of ash dyke may be provided.
- 2) The WBM road on the dyke shall be designed for heavy loads at least 40 MT as per IRC guidelines.
- 3) It is advisable that along with WBM, minimum 100mm thickness of BM (Bituminous macadam) and 40 mm thickness of BC (Bituminous concrete) is to be provided for smooth movement of inspection/maintenance vehicles.
- 4) Top width of the dyke shall be 6 m to accommodate a Single lane road of about 3.75 m width with shoulder on both sides on the top of dyke throughout the length of lagoons having provisions for the overtaking zone of 10 m width.
- 5) Provision of guard wall/posts along edge on either side of ramp with fluorescent white & black colors stripe paints may be made, wherever feasible.
- 6) At each entry point for vehicle movement, there is need to widen the dyke top up to 10m on either side of entry point by 50 m considering double lane road. The base width of dyke shall be increased accordingly considering the slope of the dyke.
- 7) Ash dyke embankment should not be used for regular plying of heavily loaded vehicles; however, exit/ entry of the vehicles into or from ash pond may done by Site by providing additional number of suitable approaches/ ramps on either side as per requirement and site condition.
- 8) Wherever ramps are required as per site requirement to approach on the dyke top, suitable drainage provision through number and size of pipes to be decided depending upon discharge at toe drain shall be provided.
- 9) At the junctions between approach road & dyke top, the kerb shall be replaced by suitable hump as per site conditions. Provision of Safety poster and required road safety signage at each side of Dyke road for ensuring safe transportation.

3.12 Slurry discharge points for Lean slurry disposal

Multi point discharge shall be adopted to (i) achieve more or less uniform ash filling within the lagoon, (ii) completely utilize the available storage capacity and (iii) maintenance of water cover throughout to avoid island formations of ash within the lagoon leading to fugitive dust problem.

Ash slurry shall be discharged in a lagoon starting from the areas near the well and progressively shifting from the well area to the areas away from the well. No discharge shall be allowed on the slopes. A minimum of 5H (H is the Height of the embankment) shall be maintained from the heel of the embankment. The discharge shall also ensure that ash surface is not exposed anywhere above the water level.

3.13. Slurry discharge points for HCSD disposal

It is recommended to locate the discharge spigots at every 200 meter intervals by providing T sections on top of the main dyke. A blind flange should isolate each T open end. There will be 2 or 3 discharge lines at each discharge spigot going inside the storage area depending of the number of main discharge lines on the top of the relevant dyke.

Just downstream each T the piping should also be isolated from the slurry flow in order to avoid clogging of this pipe by slurry.

3.14. Rehabilitation of the storage area

After completion of the storage area operations, designated areas can be rehabilitated by covering these areas by top soil and vegetation after checking stability and consistency. It is advised that a civil engineering survey is to be executed to verify the stability of the filled area and to advise in a cultivation scheme/solar or wind power plants or other purposes as allowed under Ash Utilization Notification.

CHAPTER 4

DESIGN PROCEDURE FOR ASH POND

4. General

In general, for Ash disposal, Starter Dyke of height 10-15m height and subsequent raisings of 3-5m height each (effective height) for future storage are considered. The stability analysis is to be performed for starter ash dyke without raising and with each subsequent raising separately for static and seismic cases as per IS 7894. The starter dyke to be constructed first and subsequent raisings to be constructed in stages after the starter dyke is filled with ash to its capacity. Homogeneous embankment is generally preferred using earth for starter dyke and ash in dyke raisings with 500mm(min) thick earth cover. Typical section of Ash Pond with upstream raisings is shown below fig 12

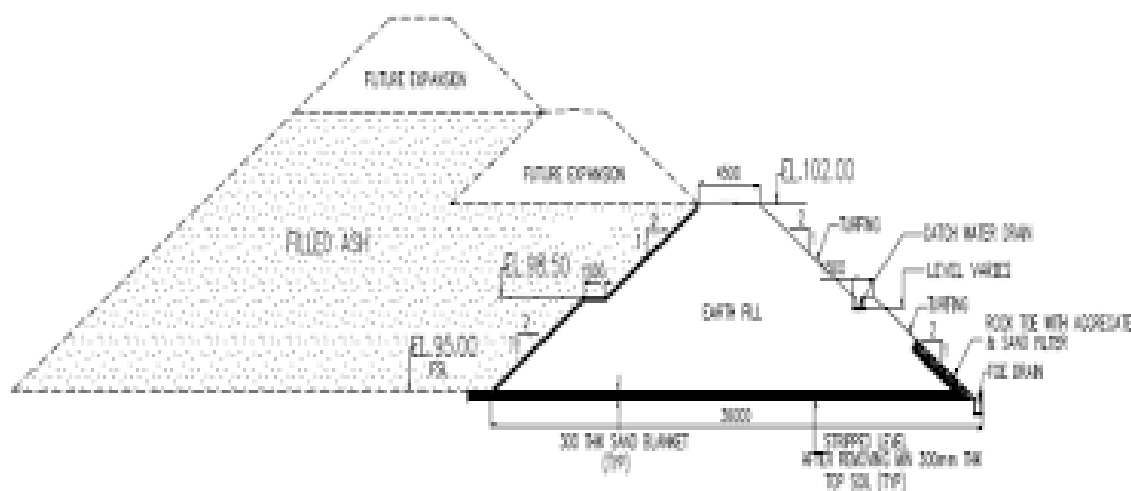


Fig 12 Typical section of Ash Pond

The topography of the proposed ash dyke area shall be evaluated. The top levels of dyke in different lagoons are to be decided based on the ground topography, ash characteristics, ash disposal system and foundation conditions.

4.1 Stability

The stability of the dyke embankments is checked for

- i) static and
- ii) seismic conditions as per IS: 7894.

The Criteria for safe design of earthen dyke should be in line with IS:12169 (Criteria for Design of Small Embankment Dams) and IS:8826 (Guidelines for Design of Large Earth & Rock-fill Dams) as applicable.

The basic requirements for design of embankment dams are to ensure:

- a) safety against overtopping;
- b) stability, and safety against internal erosion
- c) base design and Ash water collection to prevent infiltration
- d) run-on control and runoff control & collection

4.2 Factors to be considered for safe design of ash dyke embankments.

- 1) There should be no danger of over topping. This involves sufficient spillway capacity, and adequate net free board, considering also the settlement of the dam and foundations. In seismic zones, extra allowance is needed for free board. A minimum free board (from water level to top of the dyke) of 1.5m is suggested for ash ponds as per IS 10635.
- 2) The location of the outlet/spillway shall be such that by suitably locating the ash slurry discharge pipe outlets, the fringes of the ash dyke all around are filled up first. The top of the outlet shall be decided so as to ensure continuous flow of slurry water towards the outlet without allowing heading up of water along the fringes of dyke.
- 3) The seepage line should not cross the downstream face above one third height of the dyke. This is to prevent “sloughing” of the face and possible failure. If the seepage line meets the downstream face, the toe softens by saturation and due to adverse seepage forces, a local failure at the toe may occur. This is avoided by the provision of internal drainage arrangement in the dyke. In case of no data, the top seepage line (phreatic line slope may be taken as 1(V):6(H), sloping down wards.
- 4) Water passing through or under the dyke should be unable to remove material of the dyke or foundation. This criterion is meant for protection against piping failures and involves provision of filters in the embankment section, and seepage control measures for foundations.
- 5) There should be no opportunity for free flow of water from upstream to downstream face. Free flow may occur through internal cracks, along conduits or after erosion caused by leaks from pressure conduits, at joint with masonry or concrete sections or with abutments, through

layers left loosely compacted, through holes made by rats or animals or those left by rotten roots of dead trees etc. Once a concentrated leak starts, it is almost impossible to avoid failure. Precautions have to be taken against all these eventualities.

- 6) The upstream and downstream slopes should be stable against the most adverse conditions to which they can be subjected. Both slopes have to be checked for end of construction condition when rapid mechanized construction is carried out, which generates large undissipated pore pressures in the compacted layers. Instability may also arise from presence of thin pervious seams in clay foundations which may transmit high consolidation pore pressures generated under the embankment by its load to lightly loaded areas beyond the toe of the dam and thus cause failure.
- 7) In seismic zones any of the above conditions may have to be combined with seismic effects.
- 8) The foundation shear stresses should be smaller than the shear strength to provide a suitable margin of safety. This problem is likely to arise in case of foundations of highly plastic clays, the period just after the construction of dam being the most critical.
- 9) Both the upstream face and the downstream face should be properly protected against wave action and rain cuts.

4.3 Geotechnical investigation

Detailed investigations shall be conducted to find out the properties of foundation soil within the proposed ash pond area including permeability of soil. The dyke shall be founded on a firm stratum suitable ground improvement if required shall also be carried out based on geotechnical investigation.

Detailed laboratory tests shall be conducted to establish the physical, chemical and engineering properties of soil and analysis of subsoil water. In case, grained surface is not suitable, it should be used only after ground improvement based on the detailed Geotechnical investigation report. Based on properties of founding soil and fill material, the stability and seepage analysis shall be carried out.

Detailed investigations shall be conducted to find out the properties of foundation soil as well as the borrow area soil for starter dyke embankment, filter material. Detailed investigations shall include but not be limited to the following:

i) Foundation Soil along the alignment of dyke embankment

- a. Collection of disturbed and undisturbed samples and conducting Standard Penetration Test in Boreholes.
- b. Collection of undisturbed samples from trial pits.
- c. Conducting field permeability test in bore holes by pumping in/out tests depending upon the position of Ground Water Table and in trial pits by percolation test. Packet tests in rock.
- d. Laboratory tests to determine
 - 1) Bulk density and moisture content
 - 2) Grain size analysis
 - 3) Liquid limit and plastic limit
 - 4) Shrinkage limit
 - 5) Specific gravity
 - 6) Unconfined compression test
 - 7) Tri-axial test - U-U test, C-U test and C-D test on undisturbed samples.
 - 8) Compressibility of foundation material

ii) Borrow area material

Laboratory test to determine:

- 1) Grain size analysis
- 2) Liquid limit, plastic limit and shrinkage limit
- 3) Specific gravity
- 4) Standard Proctor Compaction Test
- 5) Tri axial shear test - U-U test, C-U test and C-D test on samples compacted to 95% of Standard Proctor Density.
- 6) One dimensional Consolidation test on samples compacted to 95% of Standard Proctor Density.

iii) Filter material (Sand filter)

The following laboratory tests on sand/ bottom ash (filter material) are required to be carried out. Further analysis regarding suitability of sand/ bottom ash as filter media w.r.t. base material of ash dyke embankment.

- i) Grain size Distribution
- ii) Density (Bulk & Dry)
- iii) Permeability test (Laboratory)
- iv) Specific Gravity
- v) Atterberg limits, if non-plastic the same shall be reported.

4.4 Design criteria

For defining the profile of the phreatic line across the dyke section, a comprehensive seepage analysis shall be done for the ultimate height of the dyke, with full water inside and tail water (if any due to H.F.L.), on outside of the dyke, before doing the stability analysis. The slope stability analysis of the dyke for ultimate stage shall be done for steady seepage condition both for static and dynamic (earthquake) cases as per IS. 7894

-Code of Practice for Stability Analysis of Earth Dams. Dyke shall be designed as per best engineering practice including IS and studies by reputed institutions. The design is done for the ultimate height and the unutilized ash to be stored on temporary basis/ emergency use. Base should have required liner system and Ash Water collection system to prevent infiltration. Design should ensure run-on control and runoff collection and disposal. HCSD system is designed to be operated generally at an ash concentration of 55 to 65%. This ensures drying of HCSD slurry within short period of time. Hence no liner is necessitated in HCSD System.

MINIMUM DESIRED VALUES OF FACTORS OF SAFETY AND TYPE OF SHEAR STRENGTH RECOMMENDED FOR VARIOUS LOADING CONDITIONS AS PER IS 7894-1975

Case No.	Loading Condition of Dam	Slope Most Likely to be Critical	Pore Pressure Assumptions	Type of Shear Strength Test to be Adopted	Minimum Desired Factor of Safety
I	Construction condition with or without partial pool*	Upstream and downstream	To be accounted for by Hilf's method	QR+	1.0
II	Reservoir partial pool	Upstream	Weights of material in all zones above phreatic line to be taken as moist and those below as buoyant	R S+ +	1.3
III	Sudden drawdown: a) Maximum head water to minimum with tail water at maximum b) Maximum tail water to minimum with reservoir full	Upstream	As given in 5.4.2 of IS 7894	R S+ +	1.3
		Downstream	As given in 5.4.5 of IS 7894	R S+ +	1.3
IV	Steady seepage with reservoir full	Downstream	As given in 5.5.2 of IS 7894	R S+ +	1.5
V	Steady seepage with sustained rainfall	Downstream	As given in 5.6.1 of IS 7894	R S+ +	1.3
VI	Earthquake condition: a) Steady Seepage b) Reservoir full	Downstream	As given in case IV	R S+ +	1.0\$
		Upstream	As given in Case II	R S+	1.0\$

Case No.	Loading Condition of Dam	Slope Most Likely to be Critical	Pore Pressure Assumptions	Type of Shear Strength Test to be Adopted	Minimum Desired Factor of Safety
				+	

Q-Unconsolidated Undrained Test, R-Consolidated Undrained Test, S-Consolidated drained Test

*Where the reservoir is likely to be filled immediately after completion of the dam, construction pore pressure would not have dissipated and these should be taken into consideration

+This is to be adopted for failure plane passing through impervious foundation layer.
+ S test may be adopted only in cases where the material is cohesion less and free draining.
+

\$ Values are according to IS:1983-1975 "Criteria for earthquake resistant design of structures (Third revision).

Note: These factors of safety are applicable for the methods of analysis mentioned in this standard.

4.5 OTHER BASIC DESIGN GUIDELINES

In addition to the structural stability requirements for the design of ash dyke, some basic design guidelines are given below:

a) Lagooning system

The water from the storage lagoons shall escape to the overflow lagoon (OFL) through RCC water escape well type structures and RCC hume pipes of suitable diameter. These hume pipes shall be encased with a rectangular RCC section, with minimum lining thickness of 250 mm at bottom & 150 mm on all other sides.

The water from the OFL shall escape through a RCC box culvert spillway. The outfall structure shall have stair-way type energy dissipating devices on the downstream slope of the dyke.

b) Design of Embankment

The design of embankment shall be done by a process of successive trials and refinements. The following steps may be followed.

Select a trial embankment section incorporating the available materials, with the following parameters.

i) Top width – is usually kept upto 3 to 10 m metre having a WBM road of with 100 mm and 150 mm of base & sub-base respectively.

One overtaking space shall be provided on each side on Top of the dyke. Ramp at one location shall also be provided.

ii) Free board - 1.5 metre minimum. Higher free board shall be provided if required from the anticipated wave height and from run up point of view.

iii) Side slopes - Minimum 2.5 Horizontal to 1 Vertical for earthen/ash embankment or as per design whichever is gentler. 3m wide berms shall be provided for all slopes at about 6 metre height intervals.

iv) Impervious - Bottom of all the pond shall be provided with a Liner minimum of 300 mm thick Impervious Liner (bentonite mixed soil or HCSD layer)/LDPE/HDPE liner.

v) Internal drainage arrangement:

- a) Sand chimney of minimum 0.5 metre thickness, upto 1.0 m below dyke top.
- b) Sand blanket of minimum 0.5m depth.
- c) Rock toe at the downstream toe of the embankment. Height of the rock toe should be a minimum 1.2 metre as per provisions of IS 9429. With the above drainage arrangements, the phreatic line is expected to follow the drainage path.
- d) The exit gradient of seepage flow near the downstream toe shall be checked by drawing flow nets. The exit gradient shall not exceed about 0.14. If the gradient is more than this value, the dyke slope will have to be flattened to reduce the gradient.

c) Slope protection works

- i. On the downstream slopes, where the annual rainfall is less than 200cm. and where there is no existence of water collections, turf sodding is sufficient.
- ii. When the annual rainfall is more than 200cm, downstream slopes shall be protected by minimum 30cm thick stone pitching. Wherever, there are chances of water accumulation on the downstream side, the slope shall be protected by stone pitching of

suitable thickness, depending upon the wave height likely to act on the slope, in the region from below the toe of the dyke embankment 1.5 metre above the maximum water level to 1.5 metre minimum water level.

- iii. On the upstream slope, dry fly ash brick packing (brick on flat) shall be provided for the top portion or use sand bags, tyres (or any other method if lining is provided) for a vertical height of 3 mts from the dyke top considering 1.5 m free board.
- iv. On the top of the dyke, Water Bound Macadam surfacing shall be made for movement of vehicles, which will also give protection to the earth surface against rain and wind erosion.

d) Cut-off trench

If foundation material is very impermeable, a nominal cut-off trench shall be provided in the portion upstream of sand chimney, to increase the drainage path of any seepage oncoming at the junction between the embankment and its foundation. A minimum bottom width of 4m shall be provided for the cut-off trench to facilitate compaction with rollers. If rock is available at a depth less than 1 metre, the cut-off trench may be stopped at the rock level itself. The effect of cut-off trench is not taken in the design and it is only provided as an additional precaution against piping failure in foundation. For more details, relevant IS codes may be referred.

e) Instrumentation

In order to monitor the performance of ash dyke during construction and operation the following instruments should be installed at an approximate distance of 500 metre along the alignment of the dyke and at critical locations.

- a) Piezometers
- b) Surface settlement markers

f) Sand Blanket, Chimney and filter

The material for blanket, chimney and sand filters shall consist of clean sound and well graded coarse sand. The materials shall be free from debris, wood, vegetable matter and other deleterious matter. The gradation of sand material/bottom ash shall meet the requirements as per IS 9429. The filter materials shall be suitably compacted to a firm condition to achieve a relative density of 70%. Bottom ash meeting filter criteria shall be used in lieu of sand as filter material based on availability.

CHAPTER 5

CONSTRUCTION MATERIAL

5. Embankment Material

Earth embankments can be built with all kinds of materials ranging from broken rock to silty soils, clays and ash. For a homogeneous section, materials of low permeability and low plasticity are preferable. In zoned section, two broad categories of materials may include many grades of permeability. Even random materials can be accommodated in non-critical portions of the section. The following materials are suitable for homogeneous dykes, considering their permeability, shear strength, compressibility and workability.

The embankment fill material for dyke shall belong to any one of the soil classification namely 'CH', 'CI', 'CL', 'CI-CL', 'MH', 'MI', 'ML-CL', or 'SC'. as per IS 1498-1970

5.0.1 Suitability of Soils for Construction of Earth Dams

Relative Suitability	Homogeneous Dykes	Zoned Earth Dam		Impervious Blanket
		Impervious Core	Pervious Core	
Very Suitable	GC	GC	SW,GW	GC
Suitable	CL,CI	CI,CI	GM	CL,CI
Fairly Suitable	SP,SM,CH	GM, GC, SM, SC,CH	SP,GP	CH,SM
Poor	-	ML,MI,MH	-	-
Not suitable	-	OL,OI,OH,Pt	-	-

Cut of trench filling to be done using above fill materials and prepared by blending the soil, with minimum 4 percent bentonite to achieve a permeability not more than 1×10^{-6} cm per second.

The above fill material should be free from logs, stumps, roots, rubbish or any other ingredient likely to deteriorate or affect the stability of the dyke.

5.2 Raising by Fly Ash

Ash may be used for construction of embankment in case of raising. Ash to be brought to the site from the ash pond/ location identified. Pond ash to be excavated from a minimum distance of five times height of embankment or 25m from heel of the proposed embankment of upstream & centre-line raising whichever is more.

For the earth cover (minimum 500 mm) to be provided over ash core, in the case of ash embankments, the soil shall consist of sandy loam free of admixtures of stiff clay, refuse, stumps, roots, rock, brush, weeds or other material which would be detrimental to the proper development of the vegetation growth. The earth should meet following grading analysis.

- Sand 20% to 75%
- Silt 10% to 60%
- Clay 5% to 30%

A suitable grading and thickness of earth cover should be adopted based on design requirement for stability and permeability.

5.2.1 Fly Ash

The following information on the Fly Ash to be used for dyke raising should be evaluated before commencement of work:

1. Particle size of the material
2. The maximum dry density (MDD) and optimum moisture content (OMC) as per IS code specified test, and the graph of density plotted against moisture content, for this test. In general, fly ash of compacted density lower than 1.1 gm/cc shall not be suitable for embankment construction. The design parameters should be rechecked, when fly ash of lower densities is encountered.
3. Shear strength parameters, for evaluation of the stability of proposed slopes and the bearing capacity of foundations located on the fill.
4. Compressibility characteristics, for predicting the magnitude and duration of the fill settlement.
5. Permeability and capillarity are required to assess seepage and to design drainage systems.
6. For typical geotechnical properties of Fly Ash refer Table 1 given under Clause 1 of introduction chapter.

5.2 Drainage/Filter Material

Drainage Filter:

Filters are extremely important in ash dykes and are used to prevent piping and erosion of foundation materials. Filters are constructed in layers, each of which is coarser than the one below it, and for this reason they are often referred to as reversed filters. A filter must comprise granular material fine enough to prevent soil particles being washed through it and yet coarse enough to allow the passage of water and shall be designed as per IS 9429

- i. $\frac{D_{50} \text{ of filter}}{D_{50} \text{ of base material}} < 25$
- ii. $\frac{D_{15} \text{ of filter}}{D_{15} \text{ of base material}} = 6 \text{ to } 19 / > 5$
- iii. $\frac{D_{85} \text{ of filter}}{D_{15} \text{ of filter}} > 5$

(The above equation ensures that the filter layer has permeability several times higher than that of the soil it is designed to protect)

- iv. $\frac{D_{15} \text{ of filter}}{D_{85} \text{ of base material}} < 5$

(The requirement of the above equation is to prevent piping within the filter. The ratio $D_{15}(\text{filter})/D_{85}(\text{base})$ is known as the *piping ratio*.)

- v. The gradation curve of the filter material shall be nearly parallel to the gradation curve of the base material.
- vi. The filters shall not contain more than 5% by weight of materials finer than 0.075 mm size.
- vii. The sand filter layer shall be considered as the base material for coarser filter layer.
- viii. The filter material shall be suitably compacted to a firm condition to achieve a relative density of 70%.
- ix. In addition to the above, the provisions for filter as given in "IS: 9429- Code of practice for drainage system for Earth and Rock Fill dam", also shall be followed.

For sand- material, the grading shall be decided as per filter criteria specified above, so that the embankment fill material is prevented from being carried away through the blanket, chimney and filters.

5.3 Rock Toe Material

The rock material used for the rock toe shall satisfy the following condition:

- a) Specific gravity shall not be less than 2.50 (As per IS 1122)
- b) Sulphate soundness- Less than 10% loss of weight after 5 (Five) cycles (As per IS 1126)
- c) Aggregate Impact value shall not exceed 30% (As per IS 2386)
- d) Water absorption shall not exceed 2.5% (As per IS 2386)
- e) In slake durability test (as per IS 10050), the percentage retain after two ten (10) minutes cycles shall be more than 85 %.

Rock toe shall be formed with rock material consisting of sound, durable and well graded broken rock obtained from approved quarries and shall be of approved quality prior to being transported to the area of deposition. The materials shall range in size from 10 to 45 cm. All brush, roots or other perishable materials shall be removed from rock-fill during spreading and shall be transported to a disposal area.

The rock available from the excavation of water escape structure/stripping/drain channel etc. which satisfy the quality requirements specified above. These shall be washed, cleared, and broken into required size and stacked separately.

Similarly, rock materials for rock toe satisfying the quality requirements specified above can also be obtained from rock available within the land acquired for construction of ash pond divide bund, if it is found suitable. The rock will be broken to required size and shape and will be cleaned before utilized.

5.4 GENERAL REQUIREMENTS OF HDPE/LDPE LINER

- i. The HDPE geo-membrane manufactured from first quality virgin resin only to be used. Blending of resins shall not be allowed. No recycled or reworked geo-membrane shall be used except edge trim generated during the manufacturing process (no more than 10%).
- ii. The geo-membrane shall be free of plasticizers.
- iii. The geo-membrane shall be free of leachable additives.
- iv. The geo-membrane shall be free of factory seams.

- v. The geo-membrane shall be free from dirt, oil, foreign matter, scratches, cracks, creases, bubbles, blisters, pits, tears, holes, pores, pinholes, voids, un dispersed raw material, any sign of contamination or other defects that may affect serviceability, and shall be uniform in color, thickness and surface texture.
- vi. The geo-membrane shall be capable of being seamed in the field to yield seams that areas resistant to waste liquids as the sheeting.
- vii. HDPE/LDPE material to be used shall meet the minimum requirements of GRI Standard GM13.

5.5 GENERAL REQUIREMENTS OF NON WOVEN GEOTEXTILE

- i. The non-woven geotextile shall be manufactured from first quality virgin resin. Blending of resins shall not be allowed. No recycled or reworked geotextile shall be used except edge trim generated during the manufacturing process (no more than 10%).
- ii. The geotextile shall be free of plasticizers
- iii. The geotextile shall be free of leachable additives.
- iv. The geotextile shall be free of factory seams.
- v. The geotextile shall be free from dirt, oil, foreign matter, scratches, cracks, creases, bubbles, blisters, pits, tears, holes, pores, pinholes, voids, un dispersed raw material, any sign of contamination or other defects that may affect serviceability, and shall be uniform in color, thickness and surface texture.
- vi. The geotextile shall be capable of being seamed in the field to yield seams that are as resistant to waste liquids as the sheeting.

Materials

The nonwoven thermally bonded or needle punched or any equivalent geotextile shall be used. The geotextile shall be made of polyethylene or Polypropylene or polyester or similar fibers manufactured through machine made process of heat bonding or needle punching techniques. The mean Values of Geo-textile shall be as shown in Table-3

Table 3. Guide property of non-woven geotextile

Properties	Mean Values	Test Method
i) Mechanical		
Wide width Strip Tensile	5 kN/m	EN ISO 10319
Elongation	30-50 %	EN ISO 10319
CBR Puncture resistance	2500	EN ISO 12236
ii) Hydraulic		

Apparent opening size	85 micron	EN ISO 12956
Permeability	45 l/m ² . sec	EN ISO 11058
iii) Physical		
Mass per unit area	150-300 g/sq.m.	
Thickness	1 to 2 mm	

Note: Above properties are indicative and for guidance purpose only.

CHAPTER 6

CONSTRUCTION AND SEEPAGE CONTROL

6. Introduction

Construction is a critical phase in achieving a safe dyke. Modern construction equipment permits to achieve speed with quality. Generally, a starter dyke is constructed and subsequent raising is done by either upstream / inward raising or downstream / outward raising.

In d/s method the volume of ash to be handled is more. This may add to ash utilization. Depending upon the seismic zone the method of construction may be finalized. In seismic zone V d/s method appears to be a better option than u/s construction. The various methods are shown below in figure 13.

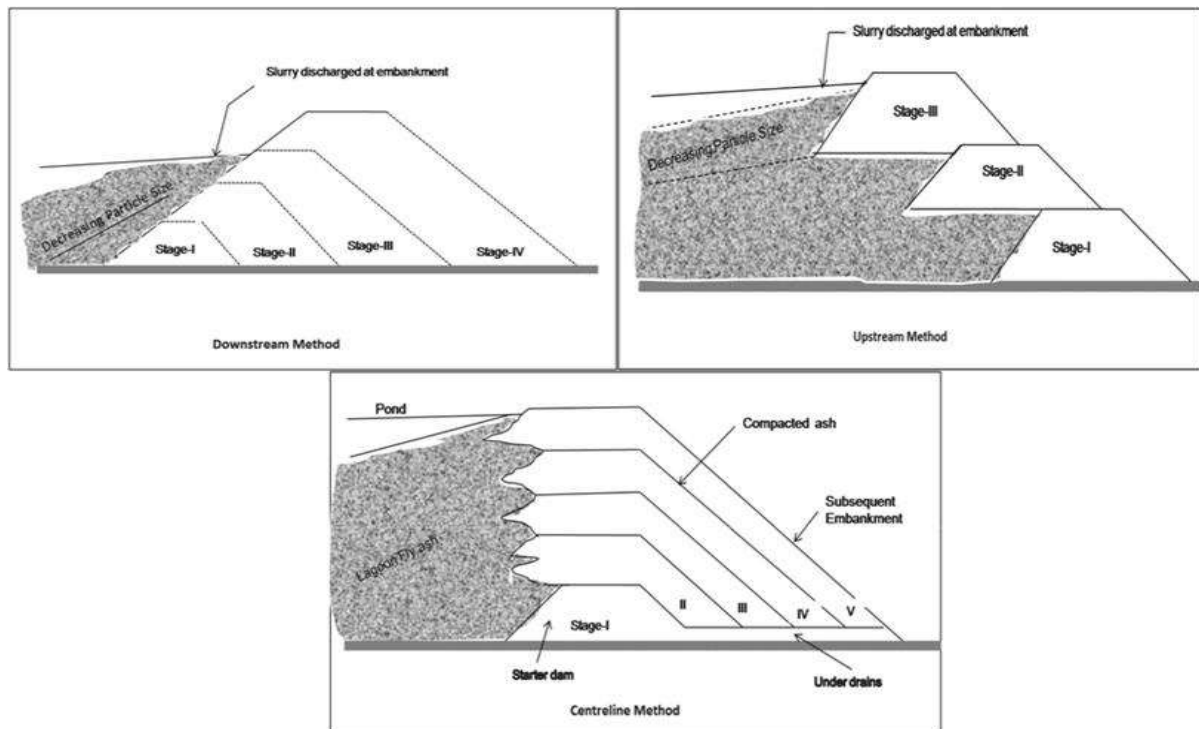


Figure 13: Showing methods of dyke construction

6.1. Preparation of Embankment Sub-Surface

6.1.1 Clearing and Grubbing

This work consists of cutting, removing and disposal of trees, bushes, shrubs, roots, grass, rubbish, etc., from the alignment and within the area of land which will accommodate the embankment, drains and such

other areas as specified on the drawings. During clearing and grubbing, adequate precautions against soil erosion, water pollution, etc are required.

All trees, stumps, etc., falling within fill area should be cut to at least 500 mm below ground level and pits shall be filled with suitable material and compacted thoroughly so as to make the surface at these points conform to the surrounding area.

The entire area meant to receive the ash and earth filling shall be stripped to a depth of minimum 150 mm. The exact depth of stripping shall be depending upon the nature of topsoil and the vegetation present.

All organic matter, vegetation, roots, stumps, bushes, rubbish, swamp materials, etc. shall be removed from the site. The stripping material and other unsuitable materials as referred above shall be kept far away from the area to be filled up so that these do not get mixed up with filling material and disposed of to an identified area.

6.1.2 Stripping and Storing of Top Soil

When constructing embankment using ash, the top soil from all areas to be covered by the embankment foundation should be stripped to specified depth not exceeding 300 mm and stored in stock piles of height not exceeding 2 m, for use in covering the fly ash embankment slopes (if soil is suitable), cut slopes and other disturbed areas where revegetation is desired. Top soil should not be unnecessarily trafficked either before stripping or when in stockpiles. Also, these shall not be surcharged or otherwise loaded and multiple handling should be kept to minimum.

6.1.3 Setting Out

After the site has been cleared, the limits of embankment should be set out true to lines, curves, slopes, grades and sections as shown on the drawings. The limits of the embankment should be marked by fixing batter pegs on both sides at regular intervals as guides before commencing the construction. The embankment should be built sufficiently wider than the design dimensions so that surplus material may be trimmed, ensuring that the remaining material is of the desired density and in position specified, and conforms to the specified slopes. Bench marks and other stakes should be maintained as long as they are required for the work.

6.1.4 Dewatering

Compaction of fill material at around optimum moisture content should be ensured. If the foundation of the embankment is in an area with stagnant water, it is feasible to remove it, the same should be, and the area of the embankment foundation should be kept dry. Care should be

taken to discharge the drained water so as not to cause damage to works, crops or any other property

6.1.5 Leveling

All existing undulations, holes, cavities, excavations made for plate load rests and other soil investigations, etc. shall be filled with pond ash having requisite moisture content. The ash thus filled shall be compacted with the help of vibratory rollers so as to achieve Dry Density of not less than 95% of Maximum Dry Density at optimum moisture content as per IS – 2720 (Part-VII). This would result in a levelled surface upon which layer wise filling and compaction of ash can be done.

6.2 Excavation of Pond Ash from Borrow Area

6.2.1 Site Clearance

All areas required for borrowing shall be cleared of all trees and stumps, roots, bushes, rubbish and other objectionable material. Particular care shall be taken to exclude all organic matter from the material to be placed in the fill. All materials thus cleared, which can be burnt shall be completely burnt. Balance shall be disposed off as specified. The cleared areas shall be maintained free of vegetation growth during the progress of the work.

6.2.2 Stripping

Borrow area shall be stripped of top layer by a depth of minimum 150 mm. The exact depth of stripping shall be decided depending upon the nature of top layer and the vegetation present.

6.2.3 Borrow area watering & dewatering

The natural moisture content of material in the borrow areas as well as the optimum moisture corresponding to the Proctor's maximum dry density for the material in the particular borrow area shall be obtained from laboratory tests. Additional moisture, if required, shall be introduced into the borrow area by watering well in advance of excavation to ensure uniformity of moisture content. If in any borrow area before or during excavation there is excess moisture, steps shall be taken to reduce the moisture by the selective excavation to secure the materials of required moisture content by excavating drainage ditches, by allowing adequate time for drying or by other means. To avoid formation of pools

in the borrow areas during excavation operations, drainage ditches from borrow areas to the nearest outlets shall be excavated so as to obtain homogeneous mix. In general, all materials from a particular borrow area shall be a mixture of materials obtained for the full depth of cut.

6.3 Construction of Pond Ash

6.3.1. Filling of Cut off Trench

The cut off trench shall be filled up in layers not exceeding 300mm in compacted thickness using impervious soils CL or CI type having permeability less than 1×10^{-6} cm/sec, to be obtained from approved borrow area. The suitability or otherwise of the material shall be determined by laboratory tests. In case clayey soil of the specified quality is not available, alternatively manufactured impervious soil by blending required quantity bentonite (not less than 4 percent) to available soil to achieve the specified permeability also can be used. Blending of bentonite with earth shall be done in dry form in a concrete mixer. Each layer of earth deposited shall then be compacted to have a dry density not less than 98% of the maximum dry density (standard proctor) for the soil with suitable tractor drawn heavy sheep foot tamping rollers or by any other method. The compaction shall have to be uniform throughout the length and breadth of each layer. The roller should be made to travel over the entire section of each layer so that the earth is fully compacted and the roller leaves no visible marks on the surface.

6.3.2 Trenches for water escape pipes

Before placing the water escape pipes within the embankment, construction of dyke upto 600 mm above the RCC lining for pipes shall be carried out without actually placing the pipes. Later on, trenches shall be excavated for pipes and lining work, pits for cut-off collars and diaphragm filters. These trenches shall then be filled using naturally available CL-ML type soil (plasticity index 7-20) or with manufactured soil by blending with bentonite to achieve specified plasticity. Earth layers deposited in these trenches shall be compacted with plate compactors to have a dry density not less than 100 percent of the maximum dry density (standard proctor).

6.3.3 Impervious core

The spreading of the next layer shall be carried out only after the underlying layer has been approved. The impervious core of the dyke shall be made with approved clayey soil brought from elsewhere and I or

with manufactured soil by blending the available sandy silty soil with bentonite (not less than 4 per cent by volume) to achieve the permeability not more than 1×10^{-6} cm/sec. The procedure for laying and compaction shall be the same as specified for the shells of dyke.

6.4 Placing the fill material

The materials for embankment shall be obtained from the approved borrow areas and available excavated material to the extent possible. In general, all materials from the particular borrow area shall be a mixture of materials obtained for the full depth of the cut. Earth material available from the excavation of cut-off trench etc. if found suitable can also be used for the embankment construction.

The distribution and gradation of materials throughout the fill shall be as shown in the approved drawings or as directed. The fills shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. The combined excavation and placing operations shall be such that the materials when compacted in the fill will be blended sufficiently to produce the specified degree of compaction and stability.

No stones, cobbles or rock fragments, having maximum dimensions of more than 10 cm shall be placed in the fill. Such stones and cobbles shall be removed either at the borrow pit or after being transported to the fill but before the materials in the fill are rolled and compacted. The materials shall be placed in the fill in continuous horizontal layers; stretching right across the whole section, not more than 30 cm in compacted thickness and rolled.

During construction a small transverse slope from center towards the edges should be given to avoid pools of water forming due to rains. The surface of materials to be placed thereon, shall be moistened and or worked with harrow, scarifier or other suitable equipment, in an approved manner to a sufficient depth to provide a satisfactory bonding surface before the next layer of fill material is placed. If the rolled surface of any fill is found to be too wet for proper compaction, it shall be raked up, allowed to dry, or shall be worked with a harrow or any other approved equipment to reduce the moisture content to the required amount and then it shall be re-compacted before the next layer is placed.

When compacting the fill material against steep rock abutment or walls or masonry or concrete structure the construction surface of embankment shall be sloped away from rock or masonry or concrete structures for a distance of 3 m to 4 m at an inclination not steeper than

6 horizontal to 1 vertical. If the foundation surface is too irregular to allow the use of a large roller directly against a structure rock outcrop, the roller shall be used to compact the fill material as close to the structure or the outcrop as possible and the portion of the embankment directly abutting against the rock or the structure shall be compacted with pneumatic hand compactors/tampers in thin layers. The moisture content of the fill material placed against the rock or the structure shall be high enough to allow it to be compacted into all irregularities of the rock or the structure. Care shall be taken in placing the first layer of the fill so that no damage is caused by the hauling machinery to the base grade as this may get concealed by the spread layer or fill. Sheep foot roller shall not be employed for compacting till the thickness of the layers already compacted by other means is greater by 30 cm than the depth of the feet on the roller drum. The material for the first layer shall be at moisture content sufficient to enable bonding of the fill with the rock surface.

6.4.1 Weather Conditions

Embankment materials shall be placed only when the weather conditions are satisfactory to permit accurate control of the moisture content in the embankment materials.

6.4.2 Moisture Control

Prior to and during compacting operations, the materials in each layer of fill shall have a moisture content about 2% less than the optimum moisture content, in the case of cohesive soil. In the case of cohesion less material including ash, the placement moisture content may have only little effect on the compaction behavior of the fill and hence appropriate moisture content required from other site considerations such as dust suppression etc, may be adopted. As far as practicable the materials shall be brought to the proper moisture content in the borrow area before excavation. If additional moisture content is required, it shall be added on the embankment by sprinkling water before rolling the layer. If the moisture content is greater than required, the material shall be spread and allowed to dry before starting rolling. The moisture content shall be uniform throughout the layer of materials. If the moisture content is more or less than the range of the required practicable moisture content, or if it is not uniformly distributed throughout the layer, rolling shall be stopped and shall be started again only when the above conditions are satisfied.

6.4.3 Degree of Compaction

While the specification provides that equipment of a particular type is to be deployed and used, compaction shall be done to achieve 95% standard Proctor density by mechanical means. Thickness of each compacted layer shall be maximum 300 mm.

Tamping (sheep foot) rollers or pneumatic rollers shall be used for compacting cohesive materials and pneumatic rollers and vibratory rollers shall be used for compacting cohesion less materials including ash. Any other suitable type of compaction equipment also can be employed after necessary field trials about their effectiveness.

6.5 Rolling and tamping

6.5.1 Rolling

When each layer of material has been conditioned so as to have the proper moisture content uniformly distributed throughout the material, it shall be compacted by passing the roller. The exact number of passes shall be decided based on compaction trials to be conducted in the field before start of work. The layers shall be compacted in strips overlapping not less than 0.6 metre. The rollers or loaded vehicles shall travel in a direction parallel to the axis of the dyke. Density tests shall be made after rolling and the dry density attained shall be not less than 95% of maximum dry density (Standard Proctor) obtained in the Laboratory for the type of material used.

6.5.2 Tamping

Rollers will not be permitted to operate within 1.0 M of concrete and masonry structures. In locations where compaction of the till material by means of the roller is impracticable or undesirable the material shall be specially compacted as specified here in at following locations:

- a) Portions of the dyke embankment adjacent to masonry structures.
- b) Earth ash in dyke embankment adjacent to steep abutments,
- c) Earth ash fill at locations specifically designated.

Fill shall be spread in compacted layers not more than 30 cm in compacted thickness and shall be moistened to have the required moisture content. When each layer of material has been conditioned to have the required moisture content it shall be compacted to achieve the dry density of not less than 95% of Maximum Dry Density (Standard Proctor) by special rollers, mechanical tampers, hand held vibratory tampers or by other approved methods, and all equipment and methods

used shall be subject to approval based on evidence of actual performance. The moisture control and compaction shall be equivalent to that obtained in the fill material actually placed in the dyke embankment.

6.6 Liner

Ash Pond lining is used to minimize any damage to the groundwater resource due to leaching of metals from fly ash. Liners can be classified depending upon their functional arrangement or type of material (clay, geo-synthetic etc) .As per the design requirement impervious soil liner or geo-membrane or geotextile liner may be provided. The following are the guidelines for the same

6.6.1 Impervious Liner using Soil

The compacted thickness of liner shall not be less than 300 mm. The suitability or otherwise of the material shall be determined by laboratory tests. In case clayey soil of the specified quality is not available, alternatively soil blended with required quantity of bentonite (not less than 4 percent by volume) to achieve the specified permeability also can be used with the same specified procedure for laying and compaction. Blending shall be done by suitable means. Layer of liner laid shall be compacted to have a dry density not less than 90% of the maximum dry density (standard proctor) for the soil with suitable rollers.

Bentonite is a fine textured colloidal clay. Sodium bentonite shall be used for the work. Laboratory tests shall be conducted to determine the percentage of bentonite needed to achieve the desired permeability of not more than 1×10^{-6} cm/sec. Soil to be used for liner shall be free from organic matter, debris etc.

The work broadly involves laying of clayey soil (or) mix of soil & bentonite, mixing of soil & bentonite, spreading the mix, compacting & Testing of Permeability.

6.6.2 Subgrade Preparation for Impervious liner

The subgrade surface should be prepared by minimum 300 mm stripping, grading, watering wherever required, and removing all vegetation, rocks, and other matter which could penetrate the Impervious Liner or decrease the uniformity of the mixture. The prepared surface shall be compacted by at least 2 passes of 8 Ton - 10 Ton roller.

In case earth for formation of dyke is borrowed from inside the lagoon where Impervious liner is to be provided, after borrowing fill material from the lagoon, the excavated surface shall be prepared with compaction by

two passes of 8 Ton - 10 Ton roller and slope shall be maintained to 1V:4H.

6.6.3 Mixing, placing & compaction of manufactured impervious soil

For mixing of soil & bentonite, any of the following method can be chosen

6.6.3.1 Mix in Other Place:

Soil & bentonite shall be mixed thoroughly in dry condition in a mixture and water shall be added, once the mix attains uniformity, the mix will be transported to site and spread over the prepared surface of lagoon to get each compacted thickness not more than 300 mm.

6.6.3.2 Mix In Place: Alternatively soil shall be spread in layers and the required bentonite shall be spread over the soil surface. The bentonite shall be spread uniformly across the accepted subgrade surface at the specified application rate. The bentonite shall be thoroughly mixed and compacted to get each compacted layer thickness not more than 300mm.

6.7 GEOMEMBRANE LINER

LDPE/HDPE liner may be provided on bottom of ash pond of the ash dyke as per requirement and to be anchored at heel of ash dyke.

Impermeable LDPE/HDPE lining of thickness minimum 1000 micron with permeability of 1×10^{-6} cm/sec and jointing of LDPE/HDPE lining with double wedge fusion welding, to prevent seepage. The liner shall be placed over minimum 50 mm thick fine sand. Arrangement for holding the liner in position by providing necessary RCC beam at top level of embankment shall be kept. The liner shall be protected by geotextile (250 GSM) overlain by 50 mm thick Plain Cement concrete of Grade (M20).

6.7.1 Cushion Layer below HDPE/LDPE Liner

The liner shall be laid over a minimum 50 mm thick layer of natural sand/ manufactured crushers and/ bottom ash. The material shall be clean with little or no fines conforming to IS1498 unless specified otherwise. The thickness and other arrangement shall be as per the details given in the drawing.

6.7.1.1 Field Placement of The HDPE/LDPE Liner

a) General Requirements:

The placement procedure used for the geo-membrane liner shall include the conditions listed below.

- i. **Weather:** Geo-membrane shall not be placed when the air temperature is above 40°C or below 5°C unless it can be by trial welds that acceptable welds can be made at the prevailing temperature. Geo-membrane shall not be placed when there is any rainfall or snowfall, in the presence of excessive moisture due to fog or dew, in ponded water, on a frozen subgrade, or during high winds.
- ii. **Panel Layout:** The panels shall be placed in accordance with the Manufacturer's panel layout drawing to ensure that they are placed in the proper direction for seaming.
- iii. **Panel Deployment:** Only the panels that can be anchored and seamed together in one shift shall be unrolled. Unroll and layout panels in as close to the final position as possible. Pulling geo-membrane panels should be minimized to reduce the chance of permanent tension. The methods and equipment used to deploy the panels shall not damage the geo-membrane or the supporting surface. Wrinkles shall be minimized. However, enough slack shall be provided in both directions so that there will be no tension in the geo-membrane at the lowest expected operating temperature.
- iv. **Precautions to Prevent Wind Damage:**
If possible, work shall be oriented in the direction of the prevailing wind. Provide adequate temporary loading and/or anchoring of the geo-membrane by the use of sandbags, tires or other means which will not damage the geo-membrane, to prevent uplift of the geo-membrane by wind.
- v. **Other Precautions to Prevent Damage:**
Protection of the geo-membrane from damage due to foot traffic on the slopes shall be provided. Provisions of facilities for safe entrance and egress of employees from sloped depressions is required.

b) Field Seaming:

Method of Seaming: The primary welding procedure for seams shall be double wedge fusion welding. Extrusion welding shall be used only for repairs, detail work, and for seaming where double wedge fusion welding is not possible. The rods used for extrusion welding shall be of the same

type of resin as the geo-membrane. The use of solvents or adhesives is not permitted.

General Requirements for Seaming: On slopes steeper than 10 horizontal to 1 vertical, seams shall be oriented parallel to the line of maximum slope (oriented up and down, not across the slope) when possible. No seams oriented across the slope shall be used.

- i. Seams parallel to the toe of the slope shall be located a minimum of 5 feet (1.5 m) from the toe.
- ii. Seams parallel to the crest of the slope shall be located a minimum of 2 feet (600 mm) from the crest.
- iii. Seams on the floor of the pond shall be overlapped so that the upslope sheet is positioned above the down slope sheet.
- iv. Seaming shall extend to the outside edge of panels to be placed in the anchor trench.
- v. Seams at corners of three or four sheets shall be completed with a patch having a minimum dimension of 24 inches (600 mm), and extrusion welded to the parent sheets. All cross seams between the two rows of seamed panels shall be welded during the coolest time of the day to allow for contraction of geo-membrane.

c) **Trial Welds Prior to Beginning Seaming**

Trial welds are required for pre-qualification of personnel, equipment and procedures for making seams on identical geo-membrane material under the same climatic conditions as the actual field production seams will be made. Trial welds shall be made as follows:

- i. Prior to each seaming period.
- ii. Every 4 to 5 hours (i.e., at the beginning of the work shift and after the lunch break).
- iii. Whenever personnel or equipment are changed.
- iv. When climatic conditions result in wide changes in geo-membrane temperature.
- v. When requested by QC & QA (Quality Control & Quality Assurance) Geo-membrane Inspector for any seaming crew or piece of welding equipment if problems are suspected.
- vi. Once qualified by passing a trial weld, welding technicians shall not change parameters without performing another trial weld.
- vii. Trial welds shall be made on both double wedge fusion welds and on extrusion welds. A test strip shall be prepared by joining two pieces of geo-membrane; each piece shall be at least 6 inches (150 mm) wide.

- viii. The length of double wedge fusion welded seams shall be a minimum of 10 feet (3 m) long.
- ix. The length of an extrusion welded seam shall be a minimum of 4 feet (1.2 m) long.

The QA Geo-Membrane Inspector shall witness the fabrication of each test strip. All test welds shall be tested by destructive testing. Testing can be done as soon as the seam cools. If any of the test specimens fail, a new test strip shall be fabricated and the tests repeated for the new strip. If additional specimens fail, the seaming apparatus and the seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and successful trial welds have been achieved. If the specimens pass the tests, production seaming operations can begin.

d) Preparation for Seaming:

- i. Prior to seaming, the surface of the geo-membrane shall be wiped with a clean cloth to ensure that it is clean and free from moisture, grease, dust, dirt, and debris of any kind before seam welding is started.
- ii. The panels shall be adjusted so that the seams are aligned to eliminate wrinkles and fish mouths. Where necessary, fish mouths and wrinkles shall be cut to achieve flat overlap.

e Seaming:

- i. Seaming shall be performed in accordance with the Manufacturer's accepted procedure.
- ii. Double Wedge Fusion Welds:
- iii. The panels shall be overlapped a minimum of 4 inches (100 mm) prior to welding. Vehicle mounted automated hot wedge welding apparatus shall be used to make the seam.
- iv. Extrusion Fillet Welding:
- v. Geo-membrane overlap shall be a minimum of 3 inches (75 mm) for extrusion welding. Panels shall be temporarily bonded using a hot air device prior to extrusion welding. The edge of the geo-membrane to be fillet welded shall be pre-beveled before heat-tacking the seam in place. The seam overlap shall be ground (abraded) no more than one hour prior to welding. Grinding shall be performed in accordance with the Manufacturer's instructions in a manner that does not damage the geo-membrane. Grinding shall not extend more than 1/4 inch past the area to be covered with extrudate during welding. All grind marks shall be covered with extrudate.

6.7.2 Non-Destructive Field Testing :

i) General

- a. All non-destructive field testing shall be performed and documented by the Geo-Membrane Contractor.
- b. The QC & QA Geo-membrane Inspector shall observe all non-destructive test procedure one hundred (100) percent of the seam length shall be tested using nondestructive procedures to check the continuity of the field seams.
- c. Non-destructive testing is not meant to qualify seam strength.
- d. Air pressure testing shall be performed in accordance with ASTM D5820 and GRI GM6.
- e. Vacuum Box testing shall be performed in accordance with ASTM D5641 and as specified herein.
- f. Continuity testing shall be performed as seaming progresses or as soon as a suitable length of seam is available, not at the completion of all field seaming.

ii) Double Wedge Fusion Welded Seams:

- a) Double fusion welded seams shall be tested using air pressure testing.
- b) The procedure for testing shall be as specified in GRI GM 6 for the type and thickness of geo-membrane in use.
- c)
- d) The repaired seam shall be re-tested as required until all leaks are identified, and repaired, and the seam passes a subsequent air pressure test.
- e) When the geometry of a double wedge fusion weld makes air testing impossible or impractical, vacuum testing may be used to test the seam.

iii) Extrusion Welded Seams:

- a) Extrusion welded seams shall be tested using vacuum chamber testing in accordance with ASTM D5641.
- b) The completed seam shall exhibit no leakage when tested between 4 and 8 psi minimum vacuum for approximately 10 seconds.
- c) If leaks are discovered during testing, they shall be located, marked, and repaired.
- d) The repaired area shall be re-tested and exhibit no leakage.

6.7.3 Destructive Testing :

i) Testing:

- a) Destructive testing shall be performed by an independent third party laboratory employed by the Geo-membrane Contractor on samples cut from production welds in the field by the Geo-membrane Contractor.
- b) Samples shall be taken to the third party laboratory and tested for shear strength and peel adhesion. For double wedge seam samples, both welds shall be tested for peel adhesion.

6.7.4 Repair of Defects and Seams

i) Patching

- a) Patching shall be used to repair large holes, tears and destructive sample locations.
- b) All patches shall be round, oval, or shall have rounded corners.
- c) All patches shall be made of the base geo-membrane material and shall extend a minimum of 3 inches beyond the edges of the defect.
- d) Patches shall be extrusion welded to the base sheet.

ii) Grinding and Welding

Grinding and welding shall be used to repair sections of extruded fillet seams with small defects.

iii) Spot Welding:

Spot welding shall be used to repair small tears, pinholes, or other minor localized flaws.

6.7.5 Heel Anchor Trench Excavation and Backfilling of HDPE Liner

The geo-membrane liner shall be anchored at heel. The excavation for anchor trench shall be done by the contractor to the lines and widths shown on the drawings prior to placement of the liner. Excavated anchor trench shall be filled with fly ash bricks or crushed aggregates carefully so that sufficient anchorage is ensured while laying the HDPE membrane. Refer for Typical detail showing LPDE/HDPE liner works figure 14.

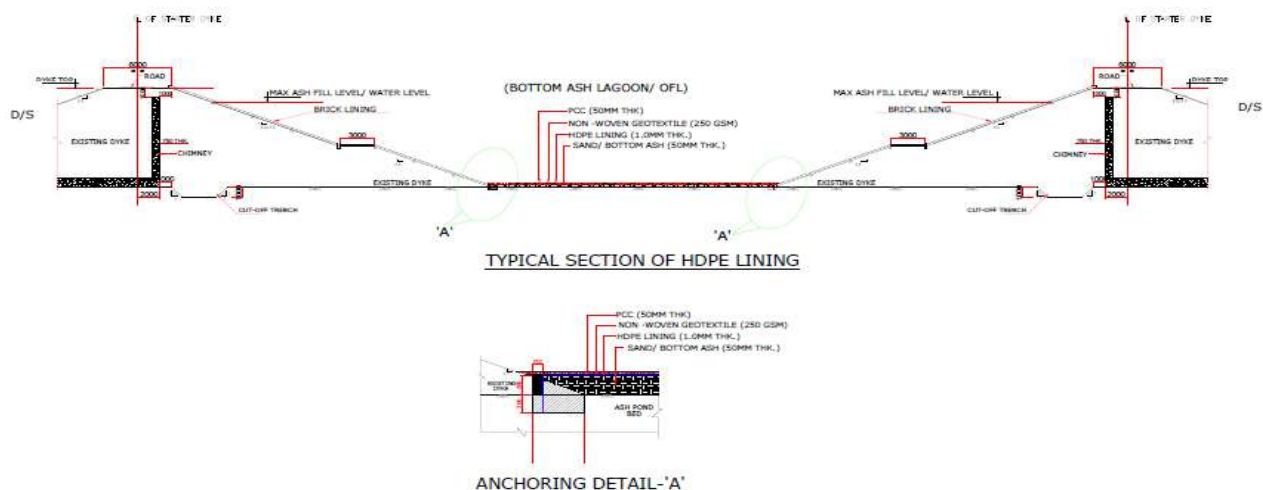


Figure 14: Typical detail showing LDPE/HDPE liner works

6.7.6 Laying and Installation of Geotextile

1) Panel Layout:

- a) Prior to manufacture and delivery of the geotextile, a panel layout of the surface to be lined shall be made. Each panel to be used for the installation shall be given a numeric or alphanumeric identification number.
- b) The panel identification number shall be related in writing to the manufacturing roll number that identifies the resin type, batch number, and date of manufacturer.
- c) The panel layout shall be made considering the following requirements:
 - i. Panel lengths shall include slope gain and anchorage.
 - ii. Perpendicular tie-ins shall be made a minimum of 5 feet (1.5 m) beyond the toe of the slope.
 - iii. A minimum of 6 inch (150 mm) overlap shall be allowed at double fusion welded seams. All field seams on slopes shall be oriented parallel to the slope (oriented along, not across the slope).
 - iv. The number of seams in corners or odd shaped geometric locations shall be minimized.

2) Packaging

a) The geotextile shall be delivered to the project site in rolls each wrapped securely with a protective covering installed at the manufacturing facility. The covering shall prevent the entrance of water, vermin and dirt, and shall be adequate for protection against ultraviolet exposure. No material shall be folded.

b) A label shall be attached to each roll of the geotextile identifying the following:

- i. Manufacturer
- ii. Product Identification, which can be traced back to the origin of the base material (resin supplier's name, resin production plant, resin brand name type, resin brand number, and production date of the resin).
- iii. Date of manufacture of the geotextile.
- iv. Roll identification number.
- v. Geotextile thickness and type.
- vi. Roll dimensions (length and width)
- vii. Batch number
- viii. Order number
- ix. Panel number

c) Packaging and transportation shall be the responsibility of the Manufacturer.

3) Handling of Rolls

The method of off-loading the geotextile at the project site shall not cause any damage.

The rolls shall be placed on a smooth surface free of rocks and standing water.

4) Cushion Layer below Geotextile

The Geotextile shall be laid over a 150 mm thick layer of natural sand/ manufactured crusher sand/ bottom ash. The material shall be clean with little or no fines conforming to IS 1498 unless specified otherwise. The thickness and other arrangement shall be as per the details given in the drawing.

6.7.7 Field Placement of the Liner

General Requirements:

The placement procedure used for the geotextile liner shall include the conditions listed below.

i) Weather:

Geotextile shall not be placed when the air temperature is above 40°C or below 5°C unless it can be demonstrated by trial welds that acceptable welds can be made at the prevailing temperature. Excessive moisture due to fog or dew, in ponded water, on a frozen subgrade, or during high winds.

ii) Panel Layout:

- a) The panels shall be placed in accordance with the panel layout drawing to ensure that they are placed in the proper direction for seaming.
- b) If panels are installed in a location other than indicated on the panel layout drawing, the revised location shall be indicated on an "as-built" layout drawing.

iii) Panel Deployment:

- a) Only the panels that can be anchored and seamed together in one shift shall be unrolled.
- b) Unroll and layout panels in as close to the final position as possible. Pulling geotextile panels should be minimized to reduce the chance of permanent tension.
- c) The methods and equipment used to deploy the panels shall not damage the geotextile or the supporting surface. Wrinkles shall be minimized. However, enough slack shall be provided in both directions so that there will be no tension in the geotextile at the lowest expected operating temperature.

iv) Precautions to Prevent Wind Damage:

- a) If possible, work shall be oriented in the direction of the prevailing wind.
- b) Provide adequate temporary loading and/or anchoring of the geotextile by the use of sandbags, tires or other means which will not damage the geotextile, to prevent uplift of the geotextile by wind.

v) Other Precautions to Prevent Damage:

- a. Protection of the geotextile from damage due to foot traffic on the slopes shall be provided.
- b. Provisions of facilities for safe entrance and egress of employees from sloped depressions is required.

6.7.8 Crest Anchor Trench Excavation and Backfilling of geotextile

The geotextile liner shall be anchored in anchor trench at the top and bottom of the slope and at berm locations as shown on the Design Drawings. The excavation for anchor trench shall be done by the contractor to the lines and widths shown on the drawings prior to placement of the liner. Excavated anchor trench shall be filled with fly ash bricks or crushed aggregates carefully so that sufficient anchorage is ensured while laying the HDPE membrane.

6.8 Dressing and Trimming of the Slopes

The outer slopes of the embankments shall be neatly dressed to line as the placing of other fill progresses. Compaction shall extend over the full width of the embankment and the material in the slopes shall be compacted as for the rest of structure. To ensure proper compaction at the outer edge, the fill shall be constructed for a minimum of 0.5m extra width on either edges or the outer edge trimmed to specified width and slope, as per construction drawings, after completion of the dyke section up to top, in different stretches of the alignment. No slope shall be left without trimming to design slope. The trimmed slope surface shall be checked for adequate compaction as specified in the Quality Assurance checklist and under-compaction, if any, shall be corrected.

6.9 Provision for Settlement

While forming the embankment, due allowance of 1 percent of the vertical height or as appropriate shall be made to allow for settlement so as to maintain the top of the dyke at designed elevation.

6.10 Drainage Filter and Rock Toe

6.10.1 Sand Blanket

Sand blanket shall be laid subsequent to site clearance, stripping and excavation, if any. The foundation area shall be cleared before laying the bottom layer of blanket material.

Filter material shall be laid in layers not exceeding 500 mm. Water as necessary shall be sprinkled before compaction. Care shall be taken to ensure that materials of different layers do not get mixed, both at the time of placing and during compaction.

Extreme care shall be taken when placing materials in the zone to obtain a fill free from lenses, layers and streaks of segregated materials. After the layers of filter blanket material and intermediate sand layer materials have been laid and compacted earth fill material shall be laid.

6.10.2 Sand Chimney

Sand chimney of specified thickness shall be laid at the specified location by excavating and removing the already compacted embankment material exposing sand chimney in the lower layers earlier laid, and refilling the trench with sand in layers. The layer of sand shall be well watered and rammed. The depth of each layer of chimney to be laid shall not be more than 500 mm. The excavated material can be reused in the embankment area. While excavating the earth for filling sand for chimney drain, the top layer of sand which has been mixed with earth, shall also be removed.

Alternatively, the sand chimney can also be laid in layers simultaneously with the laying of each layer of earth fill. In such case, the top level of sand layer shall always be kept at about 100 cm above earth level on both sides. Each layer of sand shall be well watered and rammed. Care shall be taken to avoid mixing of earth and sand.

6.10.3 Sand Filter

The sand filter underneath the rock-toe and between rip rap and the bund shall closely follow the levels of the embankment in the area. Sand filter shall be laid subsequent to stripping of foundation and/or trimming of slope of compacted bund. The excavated earth shall be removed from the working area and stockpiled at a place. The surface to receive the sand filter shall be properly cleaned before laying of filter material. The sand filter shall be laid in layers; the thickness of the layers shall not be more than 500 mm. Water as necessary shall be sprinkled before compaction. The sand layer shall be well watered and rammed. Care shall be taken that materials of different layers do not get mixed, both at the time of placing and during compaction. The sand filter material shall be clean, sound, durable and well graded. No debris, wood, deleterious material etc., shall be permitted. Accumulations of soil caused by contamination shall be removed. Refer figure 15 for typical details below.

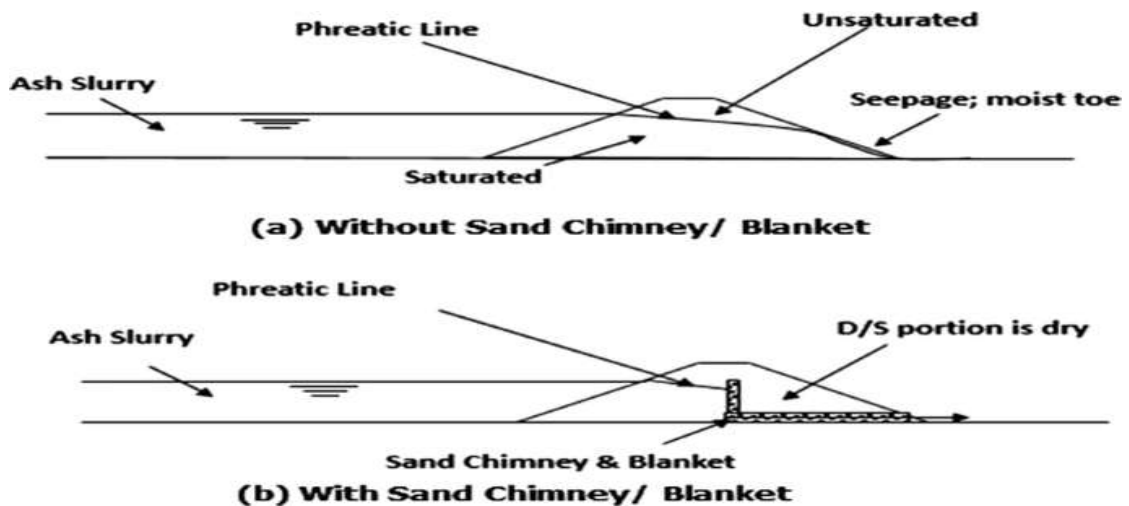


Fig 15 Typical detail of Sand filters

6.10.4 Graded coarse aggregate filters

The coarse aggregate material shall consist of durable well graded broken rock of hard stone variety from the specified quarries and shall be approved prior to being transported to the area of deposition. The materials shall range in the size from 10mm to 75mm and shall satisfy the filter criteria.

The rock material used in the aggregate filters shall satisfy the following condition:

- a) Specific gravity shall not be less than 2.50. (As per IS: 1122)
- b) Sulphate soundness less than 10% loss of weight after 5 (As per IS: 1126) (Five) cycles
- c) Aggregate Impact value shall not exceed 30%(IS 2386)
- d) Water absorption shall not exceed 2.5% (As per IS: 2386)
- e) In slake durability test (as per IS: 10050), the percentage retained after two ten (10) minutes cycles shall be more than 85%.

6.10.5 Rock toe

The rock material used for the rock toe shall satisfy the quality requirements. Rock toe shall be formed with rock material consisting of sound, durable and well graded broken rock obtained from approved quarries and shall be of approved quality. The materials shall range in size from 10 to 45 cm. All brush, roots or other perishable materials shall be removed from rock-fill during spreading and disposal.

The rock available from the excavation of water escape structure, stripping drain channel etc. which satisfy the quality requirements specified and found suitable for construction of rock toe may be used. These shall be washed, cleared, and broken into required size and stacked separately.

Similarly, rock materials for rock toe satisfying the quality requirements specified can also be obtained from rock if any available within the land acquired for construction of earthen dyke, if it is found suitable. The rock shall be broken to required size and shape and will be cleaned before utilized. Typical section of rock toe is shown below fig 16.

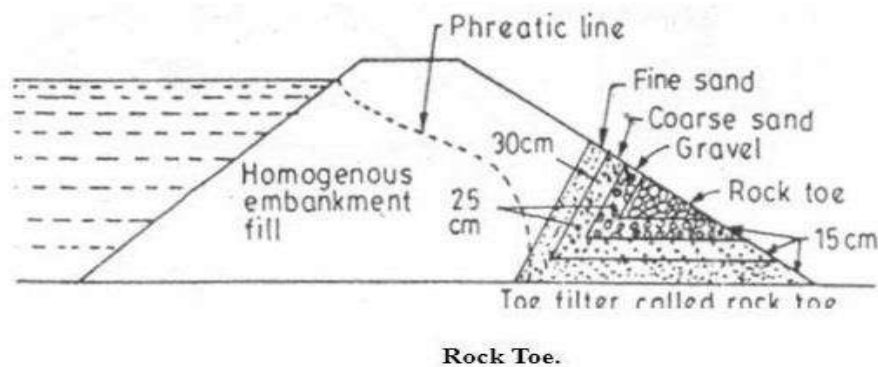


Figure 16: Typical section of Rock Toe

6.11. Placing of Rock toe

The stone pieces shall be hand placed to obtain a stable, well graded and free draining fill. The rock toe shall be constructed in layers so that the smaller rock fragments shall be placed adjacent to the filter of embankment and the large rock fragments near the outer edge of the rock toe. The rock fill shall be hand placed spread and roughly levelled in layers not greater than 30 cm in thickness in order to maintain a reasonably uniform surface and ensure that the completed fill will be stable and do not contain any voids having least dimension larger than 50 mm.

Contamination of the rock with finer materials from any other zones shall be avoided. Accumulations of soil caused by contamination shall be removed. Rock materials shall not be dumped directly but shall be hand placed in layers.

6.11.1 Rip rap on the slope of embankment

Rip rap shall be hand placed on the upstream slopes of the dam embankment as per IS: 8237 "Code of practice for Protection of slope

for reservoir embankments". The thickness of the riprap layer shall be as indicated in the drawings. The thickness shall be measured normal to slope of the embankment. The rock materials used for rip-rap shall satisfy the quality requirements specified.

The rip-rap material shall consist of the most durable rock fragments or approved quality selected for the purpose. The quality of individual rock fragments shall be dense, sound and resistant to abrasion, and shall be free from cracks, seams, shale partings, conglomerate bands and other defects that would tend to increase unduly their susceptibility to destruction by water and weathering action. The shape of the individual rock fragment shall be angular. Fragments having thickness less than 50% of their maximum dimensions shall not be used as rip rap. The stones shall be evenly distributed over the paved area. The average weight of stones shall be 15 Kgs. for 300 thick rip rap and 50 Kgs. for 600 thick rip rap.

These stones shall be placed on the edge with a longer dimension normal to the slope. Rock fragments and spells shall be tightly driven into the interstices to wedge the rip rap in place and close direct opening to underlying slope. The wedging shall be done with the largest chip practicable, each chip being well driven home with a hammer so that no chip can be removed by hand. Stones shall be laid in a compact manner beginning at the bottom of the slope. Rip rap shall be placed along with the till so that a minimum of break down will occur during placing and spreading.

6.12. QUALITY ASSURANCE

This check list is intended to be an aid in identifying aspects of testing materials and workmanship. All test results must be submitted promptly. The following minimum checks/tests shall be carried out by the contractor for ash and earth at his cost.

6.12.1 Sampling, Testing and Quality Assurance

Quality of compacted material shall be controlled through periodic checks on fly ash gradation, the compaction process or the end product, singly or in combination as directed. The end product must conform to the specifications.

6.12.2 Control Test on Borrow Material

If fly ash from more than one source is being used at the project site, monitoring must be done to identify the ash type being placed. The tests

required to be conducted on fly ash to be used as borrow material for embankment are indicated IN Quality Assurance checklist table provided. The frequency of testing indicated refers to the minimum number of tests to be conducted. The rate of testing must be stepped up as found necessary, depending on the compaction methods employed at the project IS Heavy Compaction Test.

Moisture Content: Frequency of testing shall be as per Quality Assurance Checklist Table provided below. The Samples collected for testing moisture content should be representative of the material being placed. Because fly ash may air dry relatively rapidly, samples should not be taken from the surface of the lift, but should represent the overall moisture content.

6.12.3 Analysis and Acceptance of Density Results

Analysis and Acceptance of Density Results shall be as specified under Quality Assurance Checklist Table below. The determination of density shall be in accordance with IS: 2720 (Part 28)-1974. Test locations shall be chosen by random sampling technique.

QUALITY ASSURANCE CHECK LIST

Item No.	Type of Test	Frequency/Quantum of Check	Ref. Document	Acceptance norms
1. ASH/EARTH BORROW AREA				
A)	Standard Proctor density	Once in 20,000 M ³ Of fly ash/earth	IS:2720 (Part- VII)	
B)	Moisture Content	Same as 1A) above	IS:2720 (Part- VII)	
2. ASH/EARTH WORK				
A)	In-Situ Dry Density	Once for every 2,000 M ³ or part thereof of ash & earth in each layer	IS:2720 (Part-II &XXIX)	Not less than 95% of Standard Proctor Dry Density

B)	Moisture Content	-do-	IS:2720 (Part-II)	As per specification
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CHAPTER 7

OPERATION AND MAINTENANCE OF ASH POND

7. INTRODUCTION

This section of the guidelines outlines the activities for operation and maintenance, and periodic inspection programs which will ensure safe operation of the dyke.

Preventive measures provide timely repair of dykes. An emergency action plan shall be kept in place so that the site management shall ensure to obtain safe operation of dyke.

7.1. METHOD OF SLURRY DISCHARGE

The slurry discharge near the water escape structure shall be done in the initial stages and after filling the area near the wells slurry shall be discharged at other locations.

7.2. Decanting System

The Total Suspended Solids of decanted water effluent shall be as 100 PPM measured weekly unless specified by State Pollution Control Board otherwise. For this purpose, samples shall be regularly collected and checked for TSS. A register shall be maintained with records of such measurements. In case the TSS is more than the permissible value sufficient, time for decantation shall be maintained. For increasing the decantation time, increasing the height, of spillway may not be a practical solution always.

Only where the wells are provided with precast slabs, the raising of spilling level may be feasible by inserting slabs. However, where the spilling level is fixed at FRL in the beginning itself, there is not scope for raising the spilling level.

The practical way for efficient decantation is adequate lagoon size commensurate with the rate of inflow and efficient ash filling management (i.e judicial shifting of slurry discharge points).

7.3. Maintenance of Ash Dyke

It is very important to constantly inspect the ash dyke and carryout necessary remedial measures wherever certain abnormal conditions are observed/noticed. Following aspects have to be monitored and recorded during inspection of the dyke:

- i. Design slopes:** The slopes shall be maintained as per the drawings. In case of deficiency, makeup the slopes preferably by similar material. The reason for any abnormal change in settlement shall be investigated
- ii. Top width:** The top width of the dyke shall be as per drawings. In case of any deficiency, the same shall be made up immediately.
- iii. Top level of dyke**

Top level of dyke shall be as mentioned in drawings. Any deficiency shall be made up immediately. Settlement/ sinking if any shall be immediately rectified by additional earth fill. The reason for any abnormal settlement shall be investigated.
- iv. Free board**

Freeboard as mentioned in the design shall be maintained.
- v. Earth cover and turfing**

Earth cover on the slopes mentioned in the drawings shall be maintained. Any erosion or deficiency in the slope, the same shall be restored with earth-cover of 0.5 m compacted thickness immediately.
- vi. u/s slope protection**

Slope protection shall be maintained as mentioned in drawings/specification.
- vii. WBM road, Kerb /dowel wall, slope drains**

These shall be as mentioned in the drawings. Defects if any shall be attended immediately.

viii. Rock toe, toe drain, berm, rock pitching and etc.

Rock toe, toe drain, berm, rock pitching and etc. shall be maintained as per the drawings. Dislodgements/defects if any shall be corrected immediately.

ix. Instrumentation

Piezometers surface settlement marker shall be maintained in working condition and protected from cattle grazing or theft. Defective instruments shall be replaced.

Other details like spillway, Water Escape Structure (WES) etc design bed gradient of drains not specifically mentioned but assist in maintaining the safety of dyke shall be attended properly.

- x.** To avoid erosion on u/s slope due to discharge points, the discharge points of the chute be extended inside the lagoon up to 5H from heel of dyke ('H' is the avg height of dyke).
- xi.** From Safety point, provide railing or construct a safety wall of about 1.5m height around WES wells above envisaged top level of wells using brick masonry.
- xii.** HCSD system is designed to be operated generally at an ash concentration of 55 to 65%. This ensures drying of HCSD slurry within short period of time. Operating the HCSD system at lower ash concentration will lead to accumulation of water, which prevents drying of HCSD in the dyke thereby defeating the basic intent of adopting HCSD System in power plant. So, the operation philosophy of HCSD is to be complied strictly.

7.4 Wet patches/softening on downstream slope

If the wet patches found to appear on the slopes, the area adjacent to downstream of the rock toe shall also be inspected. Corrective measures shall be taken immediately.

Frequency of inspection

- i)** As such in fair weather, dyke inspection shall be carried out once in every 15 days and in monsoon season inspection is to be carried out every week or less depending on condition of ash dyke.

All the operating and non-operating dykes shall be inspected practically after events like earthquake, cyclone, heavy rains, high flood in the river, etc. and a report prepared based on the observation, if any damage is noticed, the same shall be rectified as per the maintenance guidelines. If no suitable guidelines are found for the nature of the damage, the designer of the dyke shall be consulted immediately.

- ii) Measurements on the instruments such as piezometers and settlement etc during inspections shall be recorded. Frequency may be increased during monsoon period and proper records to be maintained.

7.5 Preventive Measures:

The pond area which is under operation shall be inspected on regular basis. If any subsidence, sink holes or crates are noticed on the surface of pond, the downstream side at the same location shall be inspected for any other signs of weakness/abnormality in the nearby area. Immediate preventive measures shall be taken. A site report of such observations shall be recorded if necessary be communicated to the designer.

i) Breach:

One of the main cause for breach of dyke/distress to the dyke is overtopping. To prevent overtopping, the design free board shall be ensured throughout the operating lagoons. Encroachment into free board must be avoided by advance planning of construction of the dyke raising in the other lagoons.

All efforts shall be made to,

- (a) Ensure that future (next) lagoon shall be kept ready before the ash level reaches the maximum design fill level.
- (b) Freeboard as mentioned in the design shall be maintained.

(ii) Erosion and Slope Protection:

The erosion beneath / on the dyke slope is responsible for the subsidence and instability of the dyke. Some of the major causes are rain cuts, insufficient soil cover / turfing etc.

Erosion on the u/s and d/s slope can be prevented by ensuring:

- (a) Compaction to the specified density both in the levelled portion of the dyke as well as on slopes.
- (b) Erosion of u/s slope of soil cover provided on ash embankment shall be prevented by pitching brick on the edge / ash cement mortar lining preferably from the bed level or heel of the dyke upto the top level.
- (c) Erosion of downstream can be prevented by turfing and proper compaction of soil at sides besides providing slope drains to guide water from the dyke tops. Suitable geotextile may be used to avoid erosion of slopes.
- (d) By providing ripraps on the downstream wherever it is subjected to rainwater.
- (e) All the rainwater from the dyke top shall be drained into the slope drains. These shall be inspected & maintained on regular basis.
- (f) Ensure proper gradient for the surface water to be drained through drains on the slopes.
- (g) Connection of dowel bank/wall & drain is maintained for draining surface water from dyke top into the slope drains.
- (h) Trees shall not be allowed to grow on the slopes and on dyke tops.
- (i) It is necessary to fill all the gullies/cuts with earth and compact slopes and provide turfing much ahead of monsoon. Geotextiles may be provided for slope protection.

(iii) Seepage and Piping

Piping or sand boiling is one of the main cause for excessive settlement or instability of the dyke. There are several reasons for this, however one of the main causes is improper drainage. This is primarily due to filter material not meeting the Filter design criteria.

Other causes may be due to use of oversized borrow material in the fill, insufficient cover or turfing, improper slope protection on the upstream slopes, encroachment into free board, rat holes etc.

Improper connection between slope drain and toe drain, connection between the WES and Pipes or the construction jointing WES are also

probable causes for seepage and piping. To prevent seepage and piping, the following shall be ensured:

- (a) The filter material shall satisfy the filter design criteria.
- (b) Toe drain shall be clear of any blockages.
- (c) The invert of the toe drain should be below the blanket drain.
- (d) The discharge/ seepage water shall be monitored for its suspended particles.
- (e) The cross-drain pipes from the toe drain shall be clear of all blockages.
- (f) The construction joints between old and new construction shall be properly keyed.

(iv) Water Logging

In case of pervious foundation, the seepage from ponds can inundate the neighboring fields, causing damage to the fields. Water logging at the downstream shall be avoided to prevent subsidence/instability of the dyke. One of the main cause is improper connectivity from toe drain to natural drain.

To overcome this defect, a seepage barrier may be constructed around the dyke by means of a grout curtain or by any other suitable seepage barrier. Other suitable methods like artificial drainage through reverse sand wicks/relief wells, sand blanket surface loading etc., pumping arrangement may have to be provided. Intermittent sumps may also be considered in case of highly water logged areas. For details of relief wells refer IS 5050:1992.

(v) Place reverse filter layer

Providing relief wells near the affected area for safe exist of the seepage water. Observe the condition and monitor the outflow from the relief wells. A register shall be maintained recording rate of flow from each relief well. Such measurements shall be taken at a frequency of 15 days. If any of the discharge pipes from the relief well is found to have been blocked, the same shall be cleared for effective relief of the seepage water.

(vi) Gulley formation

Gulley formation on the downstream face due to surface water flow during rain can be prevented by maintaining grass turving and by selecting non-erodible earth cover during the dyke construction. Further slope drains at intervals of 25-30 m will also help to avoid gulley formations. If any gully formation is noticed, the same shall be back-filled with cohesive soil and covered with grass turving.

(vii) Rat holes/animal burrows

During inspection, if any rat holes or animal burrows are noticed, the same shall be plugged immediately using sand compacted by rod and then plug at the top with earth. The holes shall be filled and covered with grass turving.

(viii) Growth of plants

Plants/trees shall not be allowed on the dyke top or slopes. Only shallow rooted grass and shrubs can be allowed. If any plant growth is noticed, the area shall be cleared by removing all the roots, plug the area with selected soil and cover with grass turving.

(ix) Choking of surface drainage

- i) Stagnation of seepage water in the drains is not desirable. This may be due to deposition of soil particles in the drain. All toe drains and surface drains shall be cleaned periodically by removing silt or vegetation for smooth flow. Design bed gradient shall be maintained.
- ii) Site/operation shall maintain record of total inflow into the ash dyke through various discharge pipes by suitable measuring system.
- iii) For routine maintenance works of ash dykes like repair of rain cuts/rat holes/gulley's/plugging of wet spots/cleaning of rock toe & peripheral drains, each station shall have Annual maintenance contract for ash dykes.

7.6 MONITORING THE DYKE

To confirm the performance of the dyke as per the design requirements, it is essential to monitor the performance of the dyke throughout its operation. Instruments commonly provided for such monitoring are listed below:

- a) Settlement gauges along the top and slopes of dyke.
- b) Piezometers, minimum 3 to 4 nos. at critical sections to check the phreatic line during various stages of operation to verify the efficiency of internal drains.
- c) Suitable device shall be installed at convenient location for Monitoring of free board. All the instruments for monitoring purpose mentioned above shall be protected against damage by the local people and by movement by vehicles and cattle. The measuring instruments shall be kept under safe custody and regularly cleaned to prevent corrosion and malfunctioning. The batteries, if any shall be regularly charged or replaced.

A typical Checklist for inspection is placed at Annexure A

7.7 OTHER GENERAL RECOMMENDATIONS

Following are necessary for effective operation and maintenance of the ash dyke:

- i. Toe drain and surface drain shall be kept clean for smooth water flow and shall be inspected for non- choking at least once in month.
- ii. Unauthorized entry into ash pond area shall be prohibited and display boards shall be installed at prominent locations. To avoid sabotage security guards for vigilance of the ash dyke area round the clock is preferable.
- iii. To facilitate inspection and maintenance the entire dyke perimeter shall have accessible roads with at least WBM topping. All around the dyke alignment there shall be a single lane inspection road at ground level, besides roads on dyke tops in all phases. At least one road (either at the ground level or at the starter dyke (top) shall be bitumen covered and connected to a bitumen covered approach road in order to ensure an all-weather approach to ash dyke area.
- iv. Flood lights on the dyke area as required may be provided for inspection purpose. These lights need to be turned on only in case of inspection during night and during emergency.
- v. A site office/pota cabin may be considered at the ash pond area. The same may be provided with telephone and transport facility.

It is desirable to have an ash management group responsible for inspection and monitoring of the ash dyke and take corrective and preventive measures where required.

- vi. One dedicated Vehicle should be allotted for ash dyke maintenance group and for dyke construction.

7.8 Manpower Requirement

Site management shall ensure adequate and complete staff to perform its functions in operation, inspection, and maintenance of dyke safety. It is essential that support personnel and equipment/facilities are provided to accommodate the needed maintenance activities.

7.9 Emergency action Plan Planning

Pre planning is required to identify condition which could lead to failure. In order to initiate measures to prevent failures is top priority. Measures shall be in place to minimize the effects of such failures. There shall Provision of Emergency management plan of Ash Dyke breach defining the roles & responsibilities of each individual and thereby escalating its effectiveness by Mock Drill practice

The Emergency Preparedness plan is given in *Annexure B*.

7.10 GUIDELINES FOR CONTROL OF FUGITIVE DUST FROM ASH PONDS

Suggested Measures to be adopted for Fugitive Dust Control are as under:

7.11 OPERATIVE LAGOON

Ponding of Water and Maintenance of Freeboard:

In the operative lagoon, ponding of water is essential in the operating lagoon to ensure proper sedimentation of ash particles. The water cover will also help in spreading ash deposition to farther distances from inlet points towards water escape structure. In case of any non-uniform deposition of ash along the periphery of the dyke due to insufficient number of discharge points, flexible pipes of HDPE etc. may be utilized

for uniform ash deposition, in the ash deficient pockets. The discharge points may be shifted /extended before the ash emerges out of the design water surface depending on availability of safe access. The lighter and flexible pipes may also be used for the farther extensions, deep into the lagoon for which floating supports, made of any lighter material may be explored for such pipes, so that the discharge pipe may float just on the ponded water surface. Maintenance of water cover will also eliminate fugitive dust emission from the ash lagoons. Free board is kept from various design considerations and it should meet the IS. Freeboard as mentioned in the design shall be maintained. The operative lagoon is designed in such a way that decant water, before escaping, should cover entire ash surface in the lagoon, by ponding and by maintaining the design freeboard.

By maintaining the freeboard as mentioned above, the ash settles uniformly under water and till the time ash deposition level is below the design level, i.e., below the overflow level of the water escape structure, the dust emission from the operative lagoon will be under control and can be eliminated by ensuring water cover in the entire lagoon area.

7.11.1 Rolling and Compaction:

The construction activities for raising of dykes and borrowing of ash will usually be going on near the periphery. Hence in the central region of the lagoon and some of the peripheral areas with no construction activities, the ash surface may be rolled and compacted which will reasonably stop the ash particles being lifted away by the mild wind flow over the surface. Rolling and compaction of ash surface with occasional wetting as per requirement, is techno-economically a better option for such undisturbed areas. However, during strong summer winds, the dust emission can be controlled, in such areas, through occasional and controlled slurry/water discharge, so that the ash surface is kept just wet. In such areas, covering the ash surface with thin layer of earth is also an alternative solution but it will not be effective without any proper compaction of the overlaying earth.

7.11.2 Slow/Occasional Discharge of Water/slurry to Wet Ash Surface:

Even in the non-operative lagoon, had the ash filling been stopped before the design freeboard is encroached, the dust emission from the ash dyke could be minimized by occasional slurry/water discharge, at a low discharge rate (i.e., by slow filling) into the non-operative lagoon to just wet the ash surface. The non-operative lagoon shall not be kept dry for long time and raising to be effected at the earliest. And since the ash surface will be below the designed level, major area of the ash

surface can easily be made wet. In case, local ponding is required in some areas, small ponds may be created using small height ash bunds confined with empty cement bags filled with ash.

For the borrow area, used for borrowing ash for dyke construction during ash dyke raising, the dust emission, may be controlled locally by sprinklers, etc and these measures in the borrow areas may also be suitably included in the scope of the contractor, for dyke raising.

7.11.3 Sprinkler System

Each station shall prepare scheme for controlling fugitive dust emission. If spray is to be done, technical specifications, pipe line layout shall be prepared by TPP's based upon typical schematic of sprinkler system as given in this document.

The lagoons especially on the perimeter, where the fugitive dust is severe, swivel type sprinklers are to be provided at every 50 metre. The sprinkler size shall be minimum 65mm.

For providing water to the sprinklers, following arrangement is required:

- a) A permanent pump house is to be provided near overflow lagoon having adequate pumping capacity and head to meet requirement. The water from overflow lagoon shall be used for sprinkling purpose.
- b) Temporary sumps on the ash pond, where the slurry is not being discharged, shall be constructed out of brick masonry of 10 m dia. and 1.5 m depth, in which the water shall be pumped. The size of the sump may vary depending on the site requirement. Near these sumps, pumps of adequate pumping capacity and head may be installed to meet sprinkling requirement. The pipe network shall be made using used ash disposal pipes.
- c) Power supply for the pumps, may be taken from the nearby source. Flexible portable Sprinkling system with suitable pumps may also be adopted as a convenient dust suppression technique from embankments under raising, inoperative lagoons & also on localized high deposition of ash in operative lagoons. A typical sketch showing the schematic arrangement for the sprinkling system is shown below Figure 17

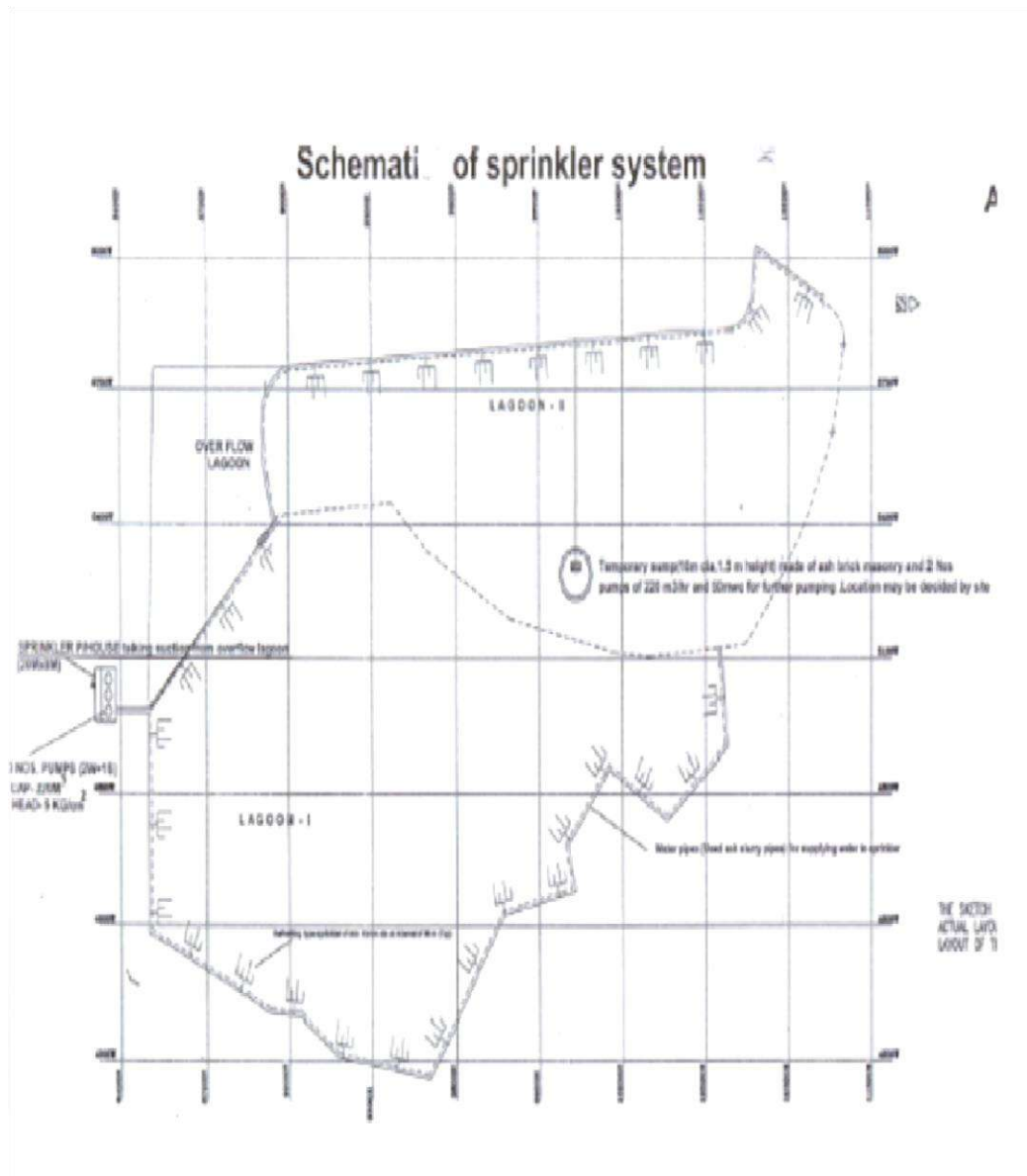


Fig 17: Typical sketch showing the schematic arrangement for the sprinkling system

7.12. Precautions for Overfilling Tendency

It has been observed that to utilize the lagoon storage capacity to the maximum possible extent, some of the project sites tend to overfill the ash ponds upto levels more than the design fill levels.

During intermediate stages for raisings, overfilling does not enhance the overall storage capacity of the ponds, except that it creates problems of ash flying, as the ash emerges out in the freeboard area above the

design water level. These higher spots, where the ash has emerged above the water surface, contribute to the dust emission, even in the operative lagoon and it will be difficult to wet these higher spots subsequently.

In non-operative overfilled pond, there is always a danger of rain water flowing from the higher ash filled area towards the dyke bund during heavy downpours and in the process, may result in the failure of dyke due to overtopping. A freeboard of 1.5 m is normally kept to avoid all such problems and accordingly the invert level of water escape structure is also kept 1.5m below the top of the dyke, called the design ash fill level.

It is therefore, advisable not to overfill the dykes and to take immediate measures for the areas already overfilled (if any), by suitably guiding the water towards the water escape structure (i.e., away from the peripheral dyke) to stop the rain water from over-topping the dyke.

ANNEXURE-A**CHECK LIST OF ASH DYKE INSPECTION**

- 1) Name of the Project:
- 2) Inspection Date;
- 3) Name of the Inspection officer:-
- 4) Season of Inspection Pre-monsoon/Monsoon/Post-Monsoon:-

Sr no	A) Ash Lagoon Details	LAG 1	LAG 2	Remarks
1.	Water level in the operation lagoon			
2.	TSS of Water effluent (Going outside/for recirculation)			
3.	Whether any ash surface is exposed above water			
4.	If ash surface is exposed above water level whether ash is flying anywhere			
5.	Whether water flowing through all the opening of the WES			
6.	Approximate head of water flow over the well slabs, 150mm			
7.	Approximate depth of water flow over ash surface around/near the operating water scape structure(WES)			
8.	Whether any inter slab leakage of ash of present in the water escape wells			
9.	Whether water flow is obstructed by floating plants or any other floating bodies near the vents in the WES			
B)	DYKE	LAG1	LAG2	
a)	Top level of Dyke			
b)	Whether there is any signs of settlement on the top of dyke			
c)	Whether any sign of sinking/Caving-in/bulging/boiling on i) Upstream slopes ii) Downstream slope iii)On the foundation very near to the downstream toe:			
d)	Whether any seepage is observed on i) Upstream slopes ii) Downstream slope iii)On the foundation very near to the downstream toe:			

e)	Whether any wet spots/areas are present i) Downstream slope ii) On the foundation very near to the downstream toe:			
f)	Whether any longitudinal cracks are observed on: i) On the top of dyke ii) The upstream slope iii) The downstream slope			
g)	Whether any transverse cracks are observed in: i) On the top of dyke ii) The upstream slope iii) The downstream slope			
h)	If any cracks are observed on the tip and the slopes i) Whether the cracks on the top & Slopes are continuous. ii) Whether the cracks are lengthening with time iii) Whether the cracks are widening with time if seepage is observed on the slope or near the d/s toe.			
	DUMPING PATTERN IN ASH POND	Lagoon 1:	Lagoon 2	
	SIGNATURE OF INSPECTION OFFICERS			

ANNEXURE B**EMERGENCY PREPAREDNESS RESPONSE PROCEDURE (EPRP) FOR
ASH DYKE BREACH**

SOURCE OF HAZARD	Escape of Ash slurry into adjacent land
Area & Location where it is being handled	Below the land of ash dyke
Case of emergency	Breach of ash dyke
Emergency Response	
Procedure to tackle	<p>Inform to the Shift-in-charge, Engineer & Fire Station about the breach as soon as it is observed.</p> <ul style="list-style-type: none"> - Inform higher authorities about the incident. -Ask for help from Maintenance Staff & O&M-Civil deptt. To stop the flow of: - Ash slurry to outside the dyke - Attend to the failed area
Personal safety	<p>First-Aid Kit available</p> <ul style="list-style-type: none"> i) Operation Control Room ii) CHP Control Room iii) First aid Centre (Plant); iv) CISF Control Room <p>First Aid centre (Plant-“O” Mtr. Service building Ambulance:-“O” Mtr. Service building Hospital : round the clock medical aid available in township Provision of Display of Emergency Contact Numbers in the ash dyke.</p>
Mitigation	<p>Divert the discharge into other ponds or lower the slurry level. If required lower the invert of water escape structure, spilled ash around Ash Dyke shall be collected and put back into the Ash Dyke. At least 400-500 sand/ash filled bags shall be kept in readiness at site. A truck/tractor shall always be available. At any point of time, availability of local labor of 100 members should be kept in readiness in case of any emergency exists. The annual maintenance contractor/AHP contractors should also be available in case of emergency.</p>
Immediate measure for plugging	<p>Plug the breach section by dumping Sand bags. Once breach is plugged, the section shall be restored to original section of dyke by proper keying the new construction with existing construction.</p>

Testing requirement	Round the clock inspection by Ash Handling Maintenance
Frequency	Yearly by O&M-Civil Ash Handling Maintenance in association with Operation Safety and Fire
RECORDS	a) Mock drill report available with safety, fire b) Actual occurrence report available c) Records as per testing requirement available

SECTION-B

**(ENVIRONMENTAL ASPECTS, ANNUAL
CERTIFICATION, STABILIZATION AND
RECLAMATION FOR OPERATIONAL AND
NEW ASH PONDS)**

CHAPTER 8

ENVIRONMENTAL ASPECTS OF ASH DISPOSAL AND REMEDIAL MEASURES

8. General

Coal used in coal fired power plant in India has low calorific value (3500Kcal/kg) and resulting high ash content.

This occupies large area of useful land for its storage and followed by polluting the atmospheric environment.

8.1 Disposal of Solid Wastes

As a consequence of combustion of coal, larger particles produced through agglomeration in furnace zone, due to heavy weight, do not escape easily into the atmosphere, rather, they settle down into pipeline because of gravitational pull and are termed bottom ash. Bottom ash contains unburned carbon to the extent of 3 – 12 % and it constitutes less than 20 % of the total ash content of the coal. The remainder which enters the connective zones of the boiler is called Fly ash. Ash severely pollutes the atmosphere. Physical and chemical changes in the mineral matter and the variation between coal, fly ash and chemical distribution occurs in fly ash is based on combustion process. Coalescence of minerals during combustion found most dominant process during the transformation of coal minerals to ash. Activation of coarse fly ash particles showed more adsorption capacity by controlling gasification of the unburned carbon.

8.2 Influence of Fly Ash On Surface Water.

Since fly ash does not contain any unburnt carbon, it should be treated as separate commodity because the presence of carbon in bottom ash affects its pozzolanic activity if mixed with fly ash. Further, the pozzolanicity of the freshly formed dry ash particles is seriously affected, once the particles get moistened with water.

Ash disposal in setting pond or land fill may influences the aquatic ecosystem through surface runoff and seepage nearby that area and finally result in contamination of ground water by leaching of heavy metals from the CCRs.

The water discharged from the ash pond is likely to contaminate the quality of river, channel, nallah water nearby that area eventually thus

contaminating the ground water. Some of the heavy metals, released from ash disposal, become detrimental to plant life.

8.3 Environmental Aspect of Fly Ash Disposal:

Following environmental aspects are to be ensured to avoid adverse impact on environment on account of ash disposal in ash dykes.

a) 100% recirculation of ash pond overflow and underflow

No discharge of liquid effluent from ash dyke into the river or any surface water body to be done. The supernatant from the ash dykes are to be recycled back to the plant to ensure 100% recirculation of ash pond overflow and underflow. Further, the water entrapped in deposited ash is to be collected through dyke embankment by intercepting through chimney/blanket filters, in to a toe-drain all around the dyke and recirculated back to the plant through toe-drain water recirculation system.

b) Fugitive Dust control

Dry fly ash is readily lifted up by wind due to less cohesive force in the fine solid particles. One of the conditions stipulated by MoEF&CC in environmental clearances is to control fugitive dust emission. The fugitive dust emission could be either from ash pond from

- a) operating lagoon,
- b) non-operating lagoon
- c) abandoned ash pond.

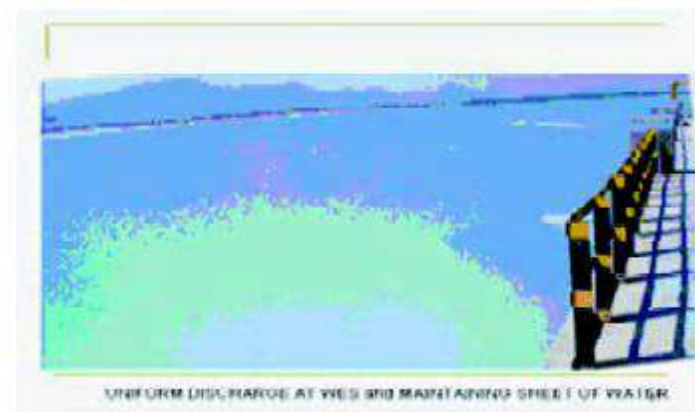
In the operative lagoons, adequate water cover is maintained over the deposited ash to prevent any fugitive dust emission from storage lagoons. However, there may be emission of fugitive dust during evacuation of ash from storage lagoons, which shall be suppressed with proper dust suppression system using water sprinklers/any other method to maintain the wetness of ash in ponds. The water available in the OFL may be used for dust suppression system. A typical dust suppression system adopted during raising of dykes is shown in following Fig 18. for reference.



a) Safe Disposal for Control of Fugitive Dust with Sprinkler



b) Safe Disposal for Control of Fugitive Dust with Uniform Discharge and Free Board



c) Safe Disposal for Control of Fugitive Dust With Sheet of Water
Figures18: Various Dust suppression system

During transportation of ash, the truck mounted water sprinklers may also be used, if fugitive dust emission occurs along in the working areas.

At the time of finally abandoning the ash dyke, to control the dust emission, the final ash surface may be covered with 300 mm thick soil. Apart from controlling the dust emission this would also assist in the growth of vegetation over the abandoned ash dyke area. Depending upon site requirement, the abandoned ash pond area may be used for planting trees or may be put for some other use as per latest fly ash utilisation notification. The final abandoned pond level however should be sufficiently lower than the top level of the peripheral ash dyke. So that the area can be properly drained towards the existing water escape structures.



19(a) Abandoned Dyke – Reclaimed



19 (b) Abandoned Dyke–Vegetation

c) Prevention of Ground Water contamination

The impervious liner as per actual site requirements is to be provided before discharge of ash in ash pond in order to achieve the required imperviousness of permeability not more than 1×10^{-6} cm/sec to prevent ground water contamination. Impervious liner (with bentonite-blended soil) may be adopted for the ash dykes in bottom ash lagoons and overflow lagoon (OFL). Where as in fly ash lagoon, the high concentration slurry (HCS) being highly viscous and self-hardening with pozzolanic properties achieves the required imperviousness of the bed in lagoon and accordingly, no additional lining may be required in fly ash lagoon disposed in HCS mode. A typical ash dyke section with impervious liner is shown in following Fig 20. for reference.



Fig 20: Typical ash dyke section with impervious liner

8.4 Health Hazards of Fly ash disposal

Fly ash disposal poses problems in the form of land use, health hazards, and hazard to entire ecosystems. Toxic trace metals present in the ash may leach out of the ash ponds and contaminate the soil, ground water and surface water, limiting the survival and growth of plants and microbial population. Medical studies have proved adverse effect on human health due to presence of respirable particulate matter $<10 \mu\text{m}$ in size. Finer particles $<2.5 \mu\text{m}$ have much greater impact as they can penetrate deeper into the respiratory system. Dispersion of particulate matter to the surrounding environment takes place, especially when ash-handling activities on dumping sites are in progress. The air borne fly ash particles deposit on surfaces of materials and plants.

In order to combat the air pollution due to industries, the Government of India has made it mandatory to have green belt areas around the new as well as existing industries. In this regard comprehensive 'Guidelines for Developing Green Belts' have been compiled by Central Pollution Control Board, Government of India, India.

In the context of environmental pollution abatement, green belt has been defined as “a strip of trees of such species, and such a geometry, that when planted around a source, would significantly attenuate the air pollution by intercepting and assimilating the pollutants in a sustainable manner.” However, green belts also include other vegetation especially shrubs, but still the trees are the mainstays of green belts and often green belt plantation is simply referred as ‘trees’

Plants filter pollutants from the air in three ways, viz. absorption by the leaves, deposition of particulate and aerosols on leaf surface, and fallout of particulate on the leeward (downwind) side of the vegetation because of the slowing of the air movement.

Some plants can be incorporated in the green belts near the thermal power plants so that these serve as filters and remove airborne fly ash particles.

CHAPTER 9

ANNUAL CERTIFICATION OF ASH PONDS AND DYKES AND ANNUAL COMPLIANCE AUDIT OF ASH GENERATION, UTILIZATION & DISPOSAL

9. General

Ash Notification 31.12.2021 (as amended by amendment notification 30.12.2022) mandates power plants to ensure **Annual Certification of the operational as well as stabilized and reclaimed ash pond and dyke** on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt etc., according to the specification and procedures laid down by CPCB in consultation with CEA, and submit annual implementation report about the compliance of provisions in the notification by the 30th day of April, every year to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC), Central Electricity Authority (CEA), and concerned Integrated Regional Office of Ministry of Environment, Forest and Climate Change by the coal or lignite based thermal power plants.

Ash Notification 31.12.2021 also mandates that **Annual Compliance Audit of Ash Utilization and Disposal** by power plants as well as user agencies shall be conducted by auditors, authorized by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report.

9.1 Annual Certification of ash pond and dykes

Design and construction specifications and operation and maintenance procedures for ash ponds and dykes have been described in previous chapters. Annual certification of ash ponds and dykes shall be carried out by a qualified professional engineer for structural stability and safety assessment and to ensure that the construction, operation, and maintenance of the ash pond and ash dykes is consistent with recognized and generally accepted good engineering standards.

1. Annual certification shall be carried out once in every year and annual implementation report about the compliance of provisions in the notification shall be submitted by the 30th day of April, every year
2. Annual certification shall be by a qualified professional geotechnical engineer.
3. TPP shall make available any kind of record/Data etc required at the time of certification.
4. Certifying Expert shall examine the Compulsory Periodic Maintenance Inspection Checklist for the Ash Pond provided by TPP
5. Certifying Expert shall submit the report which shall cover the following: -
 - a) Structural stability as per IS 7894 construction drawings, quality control documents, monitoring reports etc., to establish that the constructed ash dykes are technically sound and structurally sustainable.
 - b) Slope Protection as per relevant IS code
 - c) Adequate Spillway Capacity
 - d) Dykes compaction
 - e) Downstream erosion protection
 - f) Environmental pollution,
 - g) Available volume
 - h) Mode of disposal, water consumption or conservation in disposal, ash water recycling
 - i) Green belt
 - j) Check list for Annual Safety Audit and Check list for Fly Ash generation and utilization
 - k) Interpretations from the compulsory maintenance inspections check lists on the overall safety of the Ash Pond
 - l) Details of the actions taken on the deficiencies noted during the maintenance inspections and annual certification inspection
6. Report of the annual certification shall inter alia include observations on points mentioned in Para A(6) of the notification as well as details of the actions taken on the deficiencies noted during the safety audit.

9.2 Annual Compliance Audit of Ash Generation and Utilization & Disposal

Year wise targets for utilization & disposal of ash in the permitted avenues has detailed in the Ash Notification 31.12.2021 separately for current ash generation from implementation date 01.04.2022 onwards and for legacy ash stored as on 31.03.2022 in Para A(4) and A(5) respectively.

Annual Compliance Audit of Ash Generation and Utilization & Disposal by power plants shall be conducted by auditors authorized by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report.

9.3 Check List for Annual Certification of Ash Ponds and Dykes (for the period 1st April-31st March) to be submitted on or before 30th April

Sr No	Component	Observations/Remarks
1.	Name of Power Plant	
2.	Name of the company	
3.	District	
4.	State	
5.	Postal address for communication:	
6.	E-mail:	
7.	Power Plant installed capacity (MW):	
8.	No. of units generated (MWh):	
9.	Total area under power plant (ha): (including area under ash ponds)	
10.	Method of slurry discharge water consumption or conservation in disposal, ash water recycling	
11.	TSS of decant Water (Going outside/for recirculation)	
12.	Maintenance of Dyke.	

Sr No	Component	Observations/Remarks
	1. Top Width 2. Top level of dyke 3. Adequate Spillway Capacity 4. Free board 5. Available volume 6. Earth covering and turfing 7. U/S slope protection 8. WBM Road 9. Rock Toe, toe drain, berm, rock, pitching 10. Dyke compaction 11. D/S erosion control	
13.	Instrumentation a) Piezometer, b) surface settlement	
14.	Wet Patches/softening on down Slope	
15.	Gully Formation	
16.	Rat holes/ animal burrows	
17.	Growth of plants	
18.	Toe drain and surface drainage system.	
19.	Facilities for inspection and maintenance of the dyke	
20.	Flooding Lighting.	
21.	Seepage or Leakage	
22.	Monolith Joints -	
23.	Foundation should be examined for damage or possible undermining of the downstream toe	
24.	Slope Stability dyke: 1. Dyke Slope stability, as per IS 7894: Dyke structural stability to be examined as per construction drawings, quality control documents,	

Sr No	Component	Observations/Remarks
	<p>monitoring reports etc</p> <p>2. Dyke slopes should be examined for irregularities in alignment and variances from smooth uniform slopes, unusual changes from original crest alignment and elevation, evidence of movement at or beyond the toe, and surface cracks which indicate movement.</p>	
25.	Condition of Drainage Systems	
26.	Condition of Slope Protection	
27.	Environmental Pollution	
28.	Green belt	
29.	<p>Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:</p> <p>- moefccoalash@gov.in</p>	
30.	Signature of Authorized Signatory	

9.4 Check List for Annual Compliance Audit for Ash generation and utilization & disposal (for the period 1st April-31st March) to be submitted on or before 30th November.

Sr No	Component	Observations/Remarks
1.	Name of Power Plant	
2.	Name of the company	
3.	District	
4.	State	
5.	Postal address for communication:	
6.	E-mail:	
7.	Power Plant installed capacity (MW):	
8.	Plant Load Factor (PLF):	
9.	No. of units generated (MWh):	
10.	Total area under power plant (ha): (including area under ash ponds)	
11.	Quantity of coal consumption during reporting period (Metric Tons per Annum):	.
12.	Average ash content in percentage (per cent):	
13.	Quantity of current ash generation during reporting period (Metric Tons per Annum): Fly ash (Metric Tons per Annum): Bottom ash (Metric Tons per Annum):	
14.	Capacity of dry fly ash storage silo(s) (Metric Tons) :	
15.	Details of utilization of current ash generated during reporting period (a) Total quantity of current ash utilized (MTPA) during reporting period:	.

Sr No	Component	Observations/Remarks
	<p>(c) Quantity of fly ash utilized (MTPA): Avenue wise break up (separately for fly ash and bottom ash):</p> <p>(i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels)</p> <p>(ii) Cement manufacturing:</p> <p>(iii) Ready mix concrete:</p> <p>(iv) Ash and Geo-polymer based construction material:</p> <p>(v) Manufacturing of sintered or cold bonded ash aggregate:</p> <p>(vi) Construction of roads, road and fly over embankment:</p> <p>(vii) Construction of dams:</p> <p>(viii) Filling up of low lying area:</p> <p>(ix) Filling of mine voids:</p> <p>(x) Use in overburden dumps:</p> <p>(xi) Agriculture:</p> <p>(xii) Construction of shoreline protection structures in coastal districts;</p> <p>(xiii) Export of ash to other countries:</p> <p>(xiv) Others (please specify):</p> <p>(c) Quantity of bottom ash utilized (MTPA):</p> <p>(i) Fly ash based products (bricks or blocks or tiles or fiber cement sheets or pipes or boards or panels):</p> <p>(ii) Cement manufacturing:</p>	

Sr No	Component	Observations/Remarks
	<p>(iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and flyover embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts: (xiii) Export of ash to other countries: (xiv) Others (please specify), if recommended by the Committee and added in notification as per para A (3):</p> <p>Total quantity of current ash unutilized (MTPA) during reporting period:</p> <p>(i) Current unutilized fly ash: (ii) Current unutilized bottom:</p> <p>Total cumulative quantity of current ash unutilized (MT) after 31.03.2022 as on 31 March:</p>	

Sr No	Component	Observations/Remarks
16.	Percentage utilization of current ash generated during reporting period (per cent):	
17.	<p>Details of disposal of ash in ash ponds</p> <p>(a) Total quantity of ash disposed in ash pond(s) (Metric Tons) as on 31st March (excluding reporting period):</p> <p>(b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons):</p> <p>(c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m³):</p> <p>(d) Total number of ash ponds:</p> <p>(i) Active:</p> <p>(ii) Exhausted (yet to be reclaimed):</p> <p>(iii) Reclaimed:</p> <p>(e) total area under ash ponds (ha):</p>	
18.	<p>Individual ash pond details</p> <p>Ash pond-1,2, etc. (please provide below mentioned details separately, if number of ash ponds is more than one)</p> <p>(a) Status: Under construction or Active or Exhausted or Reclaimed</p> <p>(b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY):</p> <p>(c) Date of stoppage of ash disposal in ash pond after</p>	

Sr No	Component	Observations/Remarks
	<p>completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds) (d) area (hectares): (e) dyke height (m): (f) volume (m³): (g) quantity of ash disposed as on 31st March (Metric Tons): (h) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons): (i) expected life of ash pond (number of years and months): (j) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates) (k) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining l) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD) (m) Ratio of ash: water in slurry mix (1:____): (n) Ash water recycling system (AWRS) installed and functioning: Yes or No (o) Quantity of wastewater from ash pond discharged into land or water body (m³): (p) Last date when the dyke stability study was conducted and</p>	

Sr No	Component	Observations/Remarks
	<p>name of the organization who conducted the study: (q) Last date when the audit was conducted and name of the organization who conducted the audit:</p>	
19.	<p>Quantity of legacy ash utilized (MTPA):</p> <p>Avenue wise break up (separately for fly ash and bottom ash):</p> <p>i. Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):</p> <p>ii. Cement manufacturing:</p> <p>iii. Ready mix concrete:</p> <p>iv. Ash and Geo-polymer based construction material:</p> <p>v. Manufacturing of sintered or cold bonded ash aggregate:</p> <p>vi. Construction of roads, road and flyover embankment:</p> <p>vii. Construction of dams:</p> <p>viii. Filling up of low lying area:</p> <p>ix. Filling of mine voids:</p> <p>x. Use in overburden dumps:</p> <p>xi. Agriculture:</p> <p>xii. Construction of shoreline protection structures in coastal districts;</p> <p>xiii. Export of ash to other countries:</p> <p>xiv. Others (please specify) if recommended by the Committee and</p>	

Sr No	Component	Observations/Remarks		
	<p>added in notification as per para A(3):</p> <p>Total cumulative quantity of legacy ash utilized (MT) after 31.03.2022 as on 31 March :</p> <p>Total (depleted) quantity of legacy ash stored (MT) as on 31 March :</p>			
20.	Summary:			
	Details	Quantity generated (MTPA)	Quantity utilized (MTPA) and (per cent)	Balance quantity (MTPA)
	Current ash during reporting period			<p>Current year balance</p> <p>and</p> <p>Cumulative balance after 31.03.2022 as on 31 March both</p>
	Legacy ash	The ash stored in all the ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash.		Total (depleted) quantity of legacy ash stored (MT) as on 31 March:
	Total			
21.	Any other information: Soft copy of the annual			

Sr No	Component	Observations/Remarks		
	compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcccoalash@gov.in			
22.	Signature of Authorized Signatory			

CHAPTER 10

STABILIZATION AND RECLAMATION OF ASH PONDS

10. INTRODUCTION

Despite best efforts during the last few decades' huge quantity of fly ash is disposed of in ash ponds which is posing a serious problems of land utilization.

An ash pond of 10 KM² size for a 500 MW power plant gets filled up with Ash up to 10m height within a period of 5 years. In many ash ponds the total depth of ash has crossed over 30 metres. These ash ponds are subsequently abandoned. It is estimated that about more 40,0000 hectares of land is under the cover of abandoned fly ash ponds in the country. These abandoned ash fly ashes are generally left as such with suitable soil cover. There is a strong need to develop reclamation for such abandoned fly ash ponds.

MOEF& CC latest Ash utilization notifications dated 31.12.21 read in conjunction with amendment to the notification dated 30.12.22 says that ash pond or dyke which has been stabilized and, the reclamation has been done with **greenbelt or plantation or solar power plant or wind power plant**

Green vegetation cover is beneficial in many ways leading to conservation of biodiversity, and maintaining pleasant climate of the area, providing possible habitats for birds and animals. Green belt minimizes the build-up of pollution levels in urban / industrial areas by acting as pollution sinks. The main advantages of green belt in and around the industry are to control air and noise pollution. Trees help in trapping particulate matter, removing carbon dioxide and other pollutants from air and by release of oxygen into the air thereby improving the air quality. Green belt reduces the intensity of sound by deflect, refract or by absorb sound, it will function as barrier between industry and neighbour-hood. The intensity reduction depends upon the distance sound has to travel from source and width of the greenbelt. Green belt also helps in soil erosion control through improvement of soil quality and binding soil.

10.1. Preconditions for abandoning:

- 1) Permission from Regulatory authority: Power plant/ land owner/ agency shall obtain statutory permission from regulatory authorities such as SPCB as per the requirement.
- 2) Prevention of pollution: Suitable methods should be adopted and necessary arrangement should be made to prevent pollution during the complete exercise.
- 3) Soil Cover on the top of ash fill: The soil required for soil cover shall be excavated from nearby location. Only the minimum quantity of soil required for the purpose of cover shall be excavated from the soil borrow area. The voids so created due to removal of soil shall be filled up with ash with proper compaction and covered at top with soil cover. A 300 mm thick soil layer shall be placed over the ash fill area. This should be done as an integral part of RECLAMATION development work.
- 4) The final abandoned pond level however be lower than the top level of the peripheral ash dyke. So that the area can be properly drained towards the existing water escape structures.

10.2 Reclamation of Ash Disposal Facility

Following steps are required for reclamation of a site.

1. Complete dewatering

It is necessary to determine whether dewatering of the abandoned disposal is complete or has receded to required levels. As water table falls, stresses are increased on lower layers of the deposit which has detrimental effect on ash strength. As an initial planning, the design of the hydraulic fill may include provisions to accelerate dewatering once filling is complete. The degree of effectiveness of dewatering can be accessed using piezometers over a period of time.

2. Surface regrading and Site preparation

Generally, deposition of the material in a hydraulic fill is not level, but will be sloping from the discharge inlet to the point where water escapes from the pond. All existing undulations, holes,

cavities and excavations made for plate load rests and other soil investigations, etc. shall be filled with pond ash having requisite moisture content. The ash thus filled shall be compacted with the help of vibratory rollers so as to achieve dry density of not less 95% as per I.S-2720 (Part-VII). This would result in a levelled surface upon which soil cover can be done.

3. Placement of earth cover

Once the abandoned pond has been graded to approximate final configuration, it is necessary that the area to be covered with native soil and vegetated to prevent future erosion. The ash surface shall be covered with a minimum of compacted layer of 300 mm thickness of suitable earth. The thickness shall be as per design recommendations in rain prone area. Earth cover shall be laid simultaneously with the laying of compacted ash layers on side slopes. As in the case of ash layers, compacted thickness of earth layers shall not be exceeding 300 mm. The soil material used for plant cover shall be non-erodible and capable of supporting vegetation and plantation. No stones, cobbles or rock fragments, having maximum dimensions more than 25 mm shall be placed in the earth cover. Such stones or cobbles shall be removed either at the borrow pit or before it is used as Soil Cover.

10.3 Ash Pond reclamation with soil cover and green belt/plantation

Green capping is one of the popular methods to re-vegetate abandoned ash ponds of coal based thermal power plants thereby lowering the risk of contamination to the surrounding environment. It has innumerable advantages such as prevention of dust emission, checking soil erosion, stabilizing the surface areas of ash, preventing potential ground water contamination, and finally, adding native vegetation cover, which is very vital in the long term. The following measures are to be undertaken while reclamation of ash pond with green belt.

- i. Storm water drains shall be constructed for channelizing the run-off water away from the disposal site.
- ii. A 300 mm thick soil cover shall be provided to promote vegetation growth.
- iii. For plantation purpose, preference shall be given to both native species and mixed culture. The species will be

selected carefully from the following groups for quick reclamation under the guidance of a taxonomist:

- Tree species for fuel wood and timber
- Forestry type tree species.
- Tree species with dense foliage for shade.
- Native species.

iv. However, fruit bearing species shall be avoided.

10.3.1 Plantation for green belt

A three tier plantation approach (consisting of large trees, smaller trees and shrubs) will be followed for overall eco-restoration of the area. This will also help in checking the surface run-off, preventing the water from percolation and maintaining the aesthetics beauty of the surrounding in general a conceptual diagram of the reclaimed ash pond is presented below in figure 21

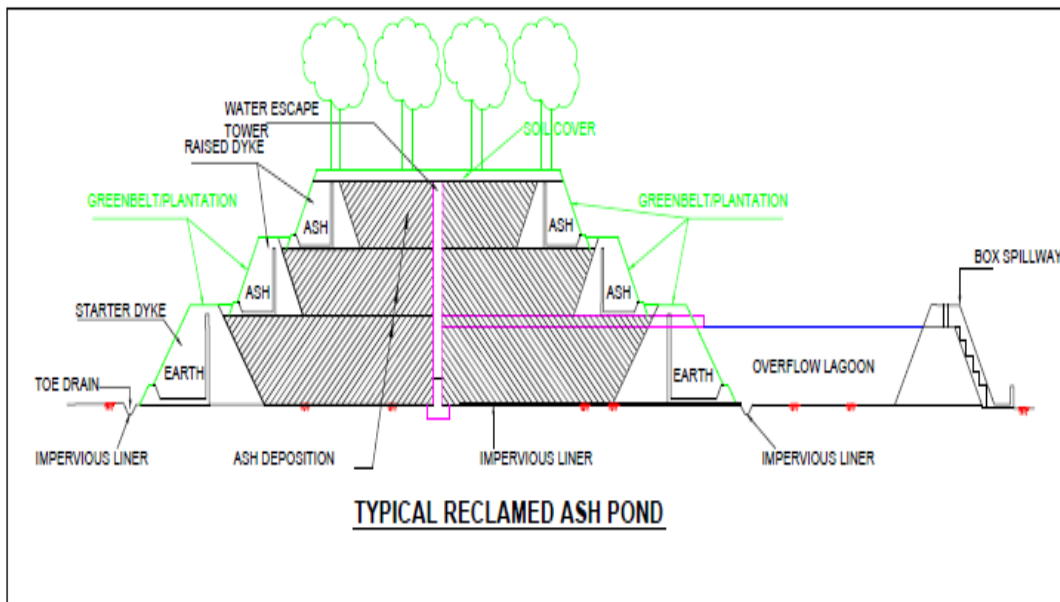


Figure 21 Typical reclaimed Ash pond

10.4 Reclamation of Abandoned Ash Pond with solar power plant or wind power plant.

Now a day there is a substantial socio economic pressure to become more environmentally aware of how we receive our power. Solar and wind power is becoming prevalent as a clean source of power. An ash pond which has been closed if can be used to generate energy in a clean way plus having financial impacts also is a need of the hour. Amendment to Fly ash utilization notification was issued vide Notification No. S.O. 6169 (E) dated

30th December, 2022 which allows reclamation of ash ponds by green belts / plantations or solar power plant or wind power plant.

The power plant shall be required to undertake detailed feasibility study for provision of solar or wind power plant on the abandoned ash dyke. The design, construction and operations of the same shall be done in accordance with the recommendations of the same. Necessary statutory clearances shall be obtained by the TPP.

Proper measures shall be taken to prevent surface erosion and air and water pollution. To facilitate drainage, surface slope and surface water drains shall be provided to carry the surface run off away from the ash pond / dykes.

10.5 Precautions during reclamation activity

The following precautionary measures are required for safe working during the reclamation activity:



- (i) Appropriate measures should be taken to prevent entry of cattle/livestock inside the pond area during execution period.
- (ii) Water sprinkling for dust suppression during handling of Ash shall be ensured from being air borne.
- (iii) After complete reclamation of the site, sign board shall be kept indicating abandoned ash pond has been reclaimed. This will help to propagate the message of provision of green belts on ash ponds and other uses such as solar power and wind power.

10.6 Annual certification of reclaimed ash ponds and dykes

Power plants shall ensure annual certification of reclaimed ash pond and dykes also in respect of safety, storm water collection and disposal, and environmental pollution and green belt etc. and shall submit report along with the certification report of operational ash ponds and dykes.

ANNEXURES

LIST OF ANNEXURES

- I. Fly Ash Notification dated 31.12.2021

Fly ash notification dtd 31st Dec, 2021.pdf
- II. Fly Ash Amendment Notification dated 30.12.2022

Flyash amendment Notification dated 30th December, 2022-1.pdf
- III. IS Codes and References



भारत का राजपत्र The Gazette of India

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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित
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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 31 दिसम्बर, 2021

का.आ. 5481(अ).—केन्द्रीय सरकार ने भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना सं. का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 द्वारा कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से तीन सौ किलोमीटर के विनिर्दिष्ट व्यास के भीतर ईंटों के विनिर्माण के लिए उपजाऊ मिट्टी के उत्खनन को प्रतिबंधित करने के लिए और भवन निर्माण सामग्री के विनिर्माण में और संनिर्माण क्रियाकलाप में फ्लाई-राख के उपयोग को बढ़ावा देने के लिए निदेश जारी किए हैं;

और, प्रदूषणकर्ता भुगतान सिद्धांत (पीपीपी) के आधार पर, ऐसा करके कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों द्वारा फ्लाई-राख का 100 प्रतिशत उपयोग सुनिश्चित करते हुए और फ्लाई-राख प्रबंधन प्रणाली की संधारणीयता के लिए पूर्वोक्त अधिसूचना को और अधिक प्रभावकारी ढंग से कार्यान्वित करने हेतु, केंद्रीय सरकार ने मौजूदा अधिसूचना की समीक्षा की;

और प्रदूषणकर्ता भुगतान सिद्धांत के आधार पर पर्यावरणीय प्रतिकर निर्धारित किए जाने की आवश्यकता है;

और, विनिर्माण को बढ़ावा देकर तथा निर्माण कार्य के क्षेत्र में राख आधारित उत्पादों तथा भवन निर्माण सामग्रियों के प्रयोग को अनिवार्य करके उपजाऊ मिट्टी को संरक्षित करने की आवश्यकता है;

और, सड़क बनाने, सड़क एवं फ्लाई ओवर के रेलिंग बनाने, तटरेखा की सुरक्षा का उपाय करने, अनुमोदित परियोजनाओं के निचले क्षेत्रों को भरने, खनित स्थलों को फिर से भरने में मिट्टी की सामग्रियों से भरने के विकल्प के रूप में राख उपयोग को बढ़ावा देकर उपजाऊ मिट्टी और प्राकृतिक संसाधनों को संरक्षित करने की आवश्यकता है;

और, पर्यावरण को सुरक्षित करना तथा कोयला अथवा लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित फ्लाई राख के निक्षेपण तथा निपटान की रोकथाम करना आवश्यक है;

और, उक्त अधिसूचना में जो 'राख' शब्द का प्रयोग किया गया है उसमें कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित फ्लाई-राख और बॉटम-राख दोनों शामिल हैं;

और, केंद्रीय सरकार प्रदूषणकर्ता भुगतान सिद्धांत के आधार पर, पर्यावरणीय प्रतिकर की प्रणाली सहित राख के उपयोग के लिए एक व्यापक ढांचा लाना चाहती है;

अतः पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत सरकार के पर्यावरण एवं वन मंत्रालय की अधिसूचना जो का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 द्वारा भारत के राजपत्र, असाधारण भाग II, खंड 3, उप खंड (i) में प्रकाशित का अधिक्रमण करते हुए, कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों द्वारा राख के उपयोग के संबंध में प्रारूप अधिसूचना जो सा.का.नि. 285 (अ) तारीख 22 अप्रैल, 2021 द्वारा भारत के राजपत्र, असाधारण, भाग-2, धारा 3, उप धारा (i) में प्रकाशित की गई थी जिसमें उन सभी व्यक्तियों से जिनका इससे प्रभावित होना सामान्य है उस तारीख से, जिसको उक्त प्रारूप उपबंधों की शासकीय राजपत्र में अंतर्विष्ट प्रतियां जनता को उपलब्ध करा दी गई थी, साठ दिनों के अवसान से पूर्व आक्षेप और सुझाव आमंत्रित किए गए थे।

और उक्त प्रारूप अधिसूचना के संबंध में उससे संभावित तौर पर प्रभावित होने वाले सभी व्यक्तियों से प्राप्त आक्षेपों और सुझावों पर केंद्रीय सरकार द्वारा सम्यक रूप से विचार कर लिया गया है;

अतः पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए और अधिसूचना का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 का उन बातों के सिवाय अधिकृत करते हुए जिन्हें ऐसे अधिक्रमण से पूर्व किया गया है या करने का लोप किया गया है, केंद्रीय सरकार कोयलों या लिग्नाइट आधारित ताप विद्युत संयंत्रों से राख के उपयोग के संबंध में निम्नलिखित अधिसूचना जारी करती है, जो इस अधिसूचना के प्रकाशन की तिथि से प्रवृत्त होगी, अर्थात्

क. फ्लाई-राख और बॉटम-राख का निपटान करने हेतु ताप विद्युत संयंत्रों (टीपीपी) के उत्तरदायित्व.-

(1) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र (जिनमें कैप्टिव और/या सह-उत्पादन केंद्र शामिल हैं या दोनों) की यह प्राथमिक जिम्मेदारी होगी कि वह अपने द्वारा सृजित राख (फ्लाई-राख और बॉटम-राख) का उप पैरा (2) में दिए गए पारि-अनुकूल तरीके से 100 प्रतिशत उपयोग सुनिश्चित करे;

(2) कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित राख का उपयोग केवल निम्नलिखित पारि-अनुकूल प्रयोजनों के लिए किया जाएगा, अर्थात्:-

- (i) फ्लाई राख पर आधारित उत्पाद अर्थात्: ईट ब्लॉक टाइल, फाइबर सीमेंट शीट, पाइप, बोर्ड, पैनल का विनिर्माण;
- (ii) सीमेंट विनिर्माण, रेडी-मिक्स कंक्रीट;

- (iii) सड़क निर्माण और फ्लाई-ओवर के रेलिंग का निर्माण, राख और जिओ-पॉलीमर आधारित निर्माण सामग्री;
- (iv) बांध का निर्माण;
- (v) निचले क्षेत्र को भरना;
- (vi) खनन कार्य से रिक्त हुए स्थान को भरना;
- (vii) सिंटेड या शीत-बद्ध राख संचय का विनिर्माण;
- (viii) मृदा परीक्षण के आधार पर नियंत्रित तरीके से कृषि;
- (ix) तटीय जिलों में तटरेखा संरक्षण संरचनाओं का निर्माण;
- (x) अन्य देशों को राख का निर्यात;
- (xi) समय-समय पर यथाधिसूचित किसी अन्य पारि-अनुकूल प्रयोजन के लिए।
- (3) अध्यक्ष, केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति गठित की जाएगी जिसमें पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफसीसी), विद्युत मंत्रालय, खान मंत्रालय, कोयला मंत्रालय, सड़क परिवहन और राजमार्ग मंत्रालय, कृषि अनुसंधान एवं शिक्षा विभाग, सड़क कांग्रेस संस्थान तथा राष्ट्रीय सीमेंट एवं भवन सामग्री परिषद के प्रतिनिधियों को सदस्यों के रूप में शामिल किया जाएगा, जिसका प्रयोजन राख के उपयोग के पारि-अनुकूल तौर-तरीकों की जांच करना, उनकी समीक्षा एवं अनुशंसा करना तथा प्रौद्योगिकीय विकासों तथा पणधारी से प्राप्त अनुरोधों के आधार पर उप-पैरा (2) में यथोल्लिखित ऐसे तौर-तरीकों की सूची में समिति द्वारा सुझाए गए तौर-तरीकों को शामिल करना या किसी तौर-तरीके को सूची से हटाना या उसमें संशोधन करना है। जब भी इस प्रयोजन के लिए अपेक्षित हो, यह समिति राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति, ताप विद्युत संयंत्र और खानों के प्रचालकों को आमंत्रित कर सकती है। इस समिति सिफारिश के आधार पर, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय ऐसे पारि-अनुकूल प्रयोजन प्रकाशित करेगा।
- (4) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र उस वर्ष के दौरान सृजित राख (फ्लाई-राख और बॉटम-राख) का 100 प्रतिशत उपयोग करने हेतु उत्तरदायी होगा; तथापि, किसी भी स्थिति में, किसी वर्ष में राख का उपयोग 80 प्रतिशत से नीचे नहीं होगा और साथ ही, उस ताप विद्युत संयंत्र को तीन वर्ष की अवधि में 100 प्रतिशत औसत राख के उपयोग का लक्ष्य प्राप्त करना होगा :

परंतु, यह और कि पहली बार के लिए लागू तीन वर्ष के चक्र को ऐसे ताप विद्युत संयंत्रों, जहां राख का उपयोग 60-80 प्रतिशत के बीच होता है, एक वर्ष के लिए और ऐसे संयंत्रों, जहां राख का उपयोग 60 प्रतिशत से कम है, दो वर्ष के लिए बढ़ाया जा सकता है, और राख के उपयोग की प्रतिशतता की गणना के प्रयोजन के लिए वर्ष 2021-2022 में उपयोग की प्रतिशत प्रमात्रा को नीचे दी गई तालिका के अनुसार ध्यान में रखा जाएगा:

तापीय विद्युत संयंत्रों के उपयोग की प्रतिशतता	100 प्रतिशत उपयोगिता प्राप्त करने के लिए प्रथम अनुपालन चक्र	100 प्रतिशत उपयोगिता प्राप्त करने के लिए द्वितीय अनुपालन चक्र
>80 प्रतिशत	3 वर्ष	3 वर्ष
60-80 प्रतिशत	4 वर्ष	3 वर्ष
<60 प्रतिशत	5 वर्ष	3 वर्ष

परन्तु, ताप विद्युत संयंत्रों के लिए 80 प्रतिशत न्यूनतम उपयोग प्रतिशतता, क्रमशः 60-80 प्रतिशत और <60 प्रतिशत की उपयोगिता की श्रेणी के तहत आने वाले ताप विद्युत संयंत्रों के लिए प्रथम अनुपालन चक्र के पहले वर्ष और पहले दो वर्षों पर लागू नहीं होगी।

परन्तु, अनुपालन चक्र के अंतिम वर्ष में सृजित 20 प्रतिशत राख को अगले चक्र में भी ले जाया जाएगा जिसका उपयोग उस अनुपालन चक्र के दौरान सृजित राख के साथ अगले तीन वर्षों में किया जाएगा।

- (5) अप्रयुक्त संचित राख अर्थात् लीगेसी राख, जिसका इस अधिसूचना के प्रकाशन से पहले भंडारण किया गया है, को ताप विद्युत संयंत्र (टीपीपी) द्वारा इस रीति से क्रमिक रूप से उपयोग में लाया जाएगा, कि लीगेसी राख को इस अधिसूचना के प्रकाशन की तिथि से दस वर्षों के भीतर पूरी तरह उपयोग कर लिया जाएगा और यह उस विशिष्ट वर्ष के चालू संचालनों के माध्यम से राख उत्सर्जन के लिए निर्धारित उपयोग लक्ष्यों से अतिरिक्त होगा।

परन्तु, निम्नलिखित प्रतिशतताओं में यथा उल्लिखित लीगेसी राख की न्यूनतम मात्रा का उपयोग तास्थानी वर्ष के दौरान कर लिया जाएगा और लीगेसी राख की न्यूनतम मात्रा की ताप विद्युत संयंत्र की संस्थापित क्षमता के अनुसार वार्षिक राख उत्सर्जन के आधार पर की जानी है।

प्रकाशन की तिथि से वर्ष	पहला	दूसरा	तीसरा-दसवां
लीगेसी राख का उपयोग (वार्षिक राख की प्रतिशतता)	कम से कम 20 प्रतिशत	कम से कम 35 प्रतिशत	कम से कम 50 प्रतिशत

परन्तु, यह और कि लीगेसी राख का उपयोग वहां अपेक्षित नहीं है, जहां राख के तालाब या डाइक स्थिर हो गए हैं और हरित पट्टी के निर्माण या पौध रोपण से पुनरुद्धार किया गया है और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड इस संबंध में प्रमाणित करेगा। किसी राख तालाब या डाइक के स्थिरीकरण और भूमि-उद्धार का कार्य, जिसमें केन्द्रीय प्रदूषण नियंत्रण बोर्ड या राज्य प्रदूषण नियंत्रण बोर्ड द्वारा प्रमाणन शामिल है, इस अधिसूचना के प्रकाशन की तारीख से एक वर्ष के भीतर किया जाएगा। अन्य सभी राख के कुंड या डाइक में शेष बचे राख का उपयोग ऊपर उल्लिखित समय-सीमाओं के अनुसार क्रमिक रूप से किया जाएगा।

टिप्पण: राख के उपयोग के लक्ष्यों को हासिल करने के लिए उप पैरा (4) और (5) के अधीन दायित्व 01 अप्रैल, 2022 की तारीख से लागू होंगे।

- (6) किसी भी नए तापीय विद्युत संयंत्र (टीपीपी) में 0.1 हेक्टेयर प्रति मेगावाट (एमडब्ल्यू) क्षेत्रफल के साथ आपातकालीन या अस्थायी राख कुंड की अनुमति दी जा सकती है। राख के तालाब या डाइकों का तकनीकी विनिर्देश, केन्द्रीय विद्युत प्राधिकरण (सीईए) के परामर्श से केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा बनाए गए दिशानिर्देशों के अनुसार होगा और ये दिशानिर्देश राख के कुंड या डाइक के संबंध में इसकी सुरक्षा, पर्यावरणीय प्रदूषण, उपलब्ध प्रमात्रा, निपटान का तरीका, निपटान में जल की खपत या संरक्षण, राख जल पुनर्चक्रण और ग्रीन बेल्ट आदि के वार्षिक प्रमाणन के लिए कार्यविधि भी निर्धारित करेंगे और इस अधिसूचना के प्रकाशन की तारीख से तीन महीनों के भीतर प्रस्तुत किए जाएंगे।
- (7) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र यह सुनिश्चित करेगा कि राख की लदाई, उतराई, ढुलाई, भंडारण और निपटान पर्यावरणीय दृष्टि से अनुकूल रीति से किया गया है और वायु और जल प्रदूषण की रोकथाम के लिए सभी ऐहियतात किए गए हैं और इस संबंध में स्थिति की सूचना इस अधिसूचना में संलग्न अनुबंध में संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को दी जाएगी।
- (8) प्रत्येक कोयला या लिग्नाइट आधारित तापीय विद्युत संयंत्र, संस्थापित क्षमता पर आधारित राख के कम से कम 16 घंटों के भंडारण के लिए समर्पित शुष्क फ्लाई राख साइलोस प्रतिष्ठापित करेगा, जिनके पास पृथक पहुंच मार्ग होंगे, जिससे कि राख पहुंचाने के कार्य को सुगम बनाया जा सके। इसकी सूचना संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को उपाबंध में दी जाएगी और केन्द्रीय प्रदूषण नियंत्रण

बोर्ड (सीपीसीबी) या राज्य केन्द्रीय प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति द्वारा समय-समय पर निरीक्षण किया जाएगा।

- (9) प्रत्येक कोयला या लिग्नाईट आधारित तापीय विद्युत संयंत्र (जिसके अंतर्गत कैप्टिव या सह उत्पादन केन्द्र भी है या दोनों), वास्तविक उपयोगकर्ता (उपयोगकर्ताओं) के हित के लिए केन्द्रीय प्रदूषण नियंत्रण बोर्ड के वेब पोर्टल या मोबाईल फोन एप्प का लिंक उपलब्ध कराकर ताप विद्युत संयंत्र के पास राख की उपलब्धता के वास्तविक आंकड़े प्रदान करेगा।
- (10) राख के 100 प्रतिशत उपयोग का वैधानिक दायित्व, जहां भी लागू हो, विधि में बदलाव के रूप में माना जाएगा।

ख. राख के उपयोग के प्रयोजनार्थ, उत्तरवर्ती उप पैराग्राफ लागू होंगे .-

- (1) ऐसे सभी अभिकरण (सरकारी, अर्द्धसरकारी और निजी), जो सड़क बिछाने, सड़क और फ्लाई ओवर के किनारों, तटीय जिलों में तटरेखा की सुरक्षा संरचनाओं और लिग्नाईट या कोयला आधारित ताप विद्युत संयंत्र से 300 किमी के भीतर बांधों जैसे निर्माण संबंधी कार्यकलापों में लगे हुए हैं, इन कार्यकलापों में अनिवार्य रूप से राख का उपयोग करेंगे :

परंतु इसको परियोजना स्थल पर निशुल्क पहुंचाया जाए और परिवहन लागत, ऐसे कोयला या लिग्नाईट आधारित ताप विद्युत संयंत्रों द्वारा वहन की जाए।

परंतु यह और कि ताप विद्युत संयंत्र पारस्परिक सहमत हुई शर्तों के अनुसार राख की लागत और परिवहन के लिए शुल्क ले सकता है उस मामले में जहां ताप विद्युत संयंत्र अन्य माध्यम से राख का निपटान करने में समर्थ है और ये अभिकरण इसके लिए प्रार्थना कर सकते हैं और बिना लागत और बिना परिवहन शुल्क के राख उपलब्ध कराने के प्रावधान तभी लागू होंगे यदि उसके लिए ताप विद्युत संयंत्र उस निर्माण अभिकरण को नोटिस जारी करता है।

- (2) उक्त कार्यकलापों में राख का उपयोग भारतीय मानक ब्यूरो, भारतीय रोड कांग्रेस, केन्द्रीय भवन अनुसंधान संस्थान, रूड़की, केन्द्रीय सड़क अनुसंधान संस्थान, दिल्ली, केन्द्रीय लोक निर्माण विभाग, राज्य लोक निर्माण विभागों और अन्य केन्द्रीय और राज्य सरकार के अभिकरणों द्वारा निर्धारित किए गए विनिर्देशों और दिशानिर्देशों के अनुसार किया जाएगा।

- (3) तापीय विद्युत संयंत्र की 300 किलोमीटर की परिधि के भीतर अवस्थित सभी खानों के लिए विस्तारित उत्पादक उत्तरदायित्व (ईपीआर) के तहत खुली आवर्त खानों में राख का पृष्ठ भंडारण करना या अधिक भार के ढेरों के साथ राख का मिश्रण करना बाध्यकारी होगा। सभी खान के स्वामी या प्रचालक (चाहे सरकारी, सार्वजनिक और निजी क्षेत्र के हो) कोयला या लिग्नाईट आधारित तापीय विद्युत संयंत्रों से तीन सौ किलोमीटर (सड़क द्वारा) के भीतर, महानिदेशक, खान सुरक्षा (डीजीएमएस) के दिशानिर्देशों के अनुसार ओवर बर्डन के बाह्य निक्षेप खान की बैकफिलिंग अथवा स्टोर्विंग (प्रचालित या छोड़ी गई खानों, जैसा भी मामला हो) के लिए उपयोग की गई सामग्रियों के भार-दर-भार के आधार पर कम से कम 25 प्रतिशत राख को मिश्रित करने के लिए उपाय करेंगे :

परंतु ऐसे तापीय विद्युत केन्द्र निःशुल्क राख प्रदान करके और परिवहन की लागत को वहन करके या पारस्परिक सहमत हुई शर्तों पर लिए गए निर्णय के अनुसार लागत या परिवहन व्यवस्था करके राख की अपेक्षित मात्रा की उपलब्धता को सुकर बनायेंगे और खानों के खाली स्थानों और ढेरों में अधिकभार के साथ राख को मिश्रित करना, सृजित अधिभार के लिए इस अधिसूचना के प्रकाशन की तिथि से लागू होगा और उक्त कार्यकलापों में राख का उपयोग, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक खान सुरक्षा और भारतीय खदान ब्यूरो द्वारा निर्धारित दिशानिर्देशों के अनुसार किया जाएगा।

स्पष्टीकरण .- इस उप-पैरा के प्रयोजन के लिए यह भी स्पष्ट किया जाता है कि लागत मुक्त राख और निःशुल्क परिवहन के उपबंध केवल तभी लागू होंगे यदि ताप विद्युत संयंत्र इसके लिए खान मालिक को नोटिस देते हैं और अधिभार वाले ढेर के साथ मिश्रित करने और खान में खाली स्थान को भरने के लिए राख के 25 प्रतिशत हिस्से के उपयोग का अधिदेश तब तक लागू नहीं होगा जब तक कि ताप विद्युत संयंत्र द्वारा खान मालिक को नोटिस न दिया गया हो।

- (5) (i) सभी खान मालिकों को खान में खाली स्थानों में राख को समायोजित करने के लिए खान बंद योजना (प्रगामी और अंतिम) तैयार करनी होगी और खान में खाली स्थानों में राख के निपटान और अधिभार वाले ढेर के साथ राख को मिश्रित करने के लिए खान योजनाओं को संबंधित प्राधिकारी अनुमोदित करेगा। पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय द्वारा ताप विद्युत संयंत्रों और कोयला खदानों की पर्यावरणीय मंजूरी की अपेक्षा से छूट देने के साथ-साथ ऐसे निपटान के लिए अपनाए जाने वाले दिशानिर्देशों के संबंध में तारीख 28 अगस्त, 2019 को दिशानिर्देश जारी किए गए।
- (ii) मंत्रालय, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक, खान सुरक्षा (डीजीएमएस) और भारतीय खान ब्यूरो (आईबीएम) के साथ परामर्श करके, खानों में खाली स्थानों में राख के निपटान करने तथा अधिभार वाले ढेरों में इसे मिश्रित करना सुगम बनाने के लिए समय-समय पर आगे भी दिशानिर्देश जारी कर सकता है और यह खान मालिकों की जिम्मेदारी होगी कि वे ऐसी खानों को अभिज्ञात करने की तिथि से एक वर्ष के भीतर विभिन्न विनियामक प्राधिकरणों द्वारा जारी की गई अनुमतियों में आवश्यक संशोधन या परिवर्तन प्राप्त करेंगे।
- (6) (i) पर्यावरणीय प्रदूषण के संदर्भ में सुरक्षा, व्यवहार्यता (आर्थिक व्यवहार्यता नहीं) और पहलुओं की जांच सहित राख से खान में खाली स्थान को वापस भरने/अधिभार वाले ढेर के साथ राख को मिश्रित करने के लिए खानों की पहचान करने के लिए पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, विद्युत मंत्रालय, खान मंत्रालय, कोयला मंत्रालय, महानिदेशक खान सुरक्षा और भारतीय खान ब्यूरो से प्रतिनिधियों को शामिल करते हुए अध्यक्ष, केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति का गठन किया जाएगा और यह समिति पणधारी मंत्रालयों या विभागों के लिए अभिज्ञात खानों (भूमिगत और खुली, दोनों) के संबंध में तैयार की गई तिमाही रिपोर्टों को अद्यतन करेगी और यह समिति, इस अधिसूचना के प्रकाशन के तुरंत पश्चात उपयुक्त खानों की पहचान करना आरंभ करेगी।
- (ii) ताप विद्युत संयंत्र या खानें, उपरोक्त अनुसार अधिदेशित उपयोग लक्ष्यों को पूरा करने के लिए उपर्युक्त समिति द्वारा पहचान किए जाने तक राख के निपटान हेतु प्रतीक्षा नहीं करेंगी।
- (7) राख से निचले क्षेत्र को भरने का कार्य, अनुमोदित परियोजनाओं के लिए राज्य प्रदूषण नियंत्रण बोर्ड की पूर्व अनुमति से और केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्धारित दिशा-निर्देशों के अनुसार किया जाएगा और राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति द्वारा अनुमोदित स्थलों, अवस्थान, क्षेत्र और अनुमत मात्रा को अपनी वेबसाइट पर प्रतिवर्ष प्रकाशित किया जाएगा।
- (8) केन्द्रीय प्रदूषण नियंत्रण बोर्ड, संगत पणधारी के साथ मिलकर, राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा अनुमति प्रदान करने के लिए समयबद्ध ऑनलाइन आवेदन प्रक्रिया प्रस्तुत करने के साथ-साथ इस अधिसूचना के अधीन परिकल्पित सभी प्रकार के कार्यकलापों के लिए एक वर्ष के भीतर दिशानिर्देश प्रस्तुत करेगा।
- (9) कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र से तीन सौ किलोमीटर के दायरे में स्थित सभी भवन निर्माण परियोजनाएं (केंद्रीय, राज्य और स्थानीय प्राधिकरणों सरकारी उपक्रमों, अन्य सरकारी अभिकरणों तथा सभी निजी अभिकरणों) राख की ईटों, टाइल्स, धातुमल राख अथवा अन्य राख आधारित उत्पादों का उपयोग करेंगी बशर्ते कि वे वैकल्पिक उत्पादों की कीमत से अधिक कीमत पर उपलब्ध न हो।
- (10) राख आधारित उत्पादों के विनिर्माण और ऐसे उत्पादों में राख के उपयोग में भारतीय मानक ब्यूरो, भारतीय सड़क कांग्रेस और केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्धारित विनिर्देशों और दिशानिर्देशों की अनुपालना होगी।
- ग. गैर-अनुपालन के लिए पर्यावरणीय प्रतिकर .-**
- (1) तीन वर्ष के चक्र के प्रथम दो वर्षों में, यदि कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र (कैप्टिव और/ या सह-उत्पादक स्टेशनों या दोनों सहित) ने कम-से-कम 80 प्रतिशत राख (फ्लाइ-राख और बॉटम-राख) उपयोग नहीं की है तो ऐसे गैर-अनुपालन ताप विद्युत संयंत्रों पर प्रस्तुत की गई वार्षिक रिपोर्टों के आधार पर वित्तीय वर्ष के

अंत में अप्रयुक्त राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि यह तीन वर्ष के चक्र के तीसरे वर्ष में 100 प्रतिशत राख का उपयोग करने में असमर्थ रहता है, तो वह अप्रयुक्त मात्रा पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर के भुगतान का पात्र होगा, जिस पर पहले पर्यावरणीय प्रतिकर नहीं लगायी गयी है।

परंतु पर्यावरणीय प्रतिकर को पैरा क के उप-पैरा (4) में उल्लिखित विभिन्न उपयोगी श्रेणियों के अनुसार प्रथम अनुपालन चक्र के अंतिम वर्ष के अंत में अनुमान लगाया जाएगा और अधिरोपित किया जाएगा।

- (2) अधिकारियों द्वारा एकत्रित पर्यावरणीय प्रतिकर को केन्द्रीय प्रदूषण नियंत्रण बोर्ड के निर्दिष्ट खाते में जमा किया जाएगा।
- (3) लैगोसी राख के मामले में, यदि कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र (कैप्टिव या सह-उत्पादक स्टेशनों या दोनों सहित) ने स्थापित क्षमता पर आधारित उत्पन्न राख का कम-से-कम 20 प्रतिशत (प्रथम वर्ष के लिए), 35 प्रतिशत (द्वितीय वर्ष के लिए), 50 प्रतिशत (तीसरे से दसवें वर्ष तक) उपयोग के बराबर लक्ष्य प्राप्त नहीं किया है तो उस वित्तीय वर्ष के दौरान अप्रयुक्त लैगोसी राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि 10 वर्ष के अंत में लैगोसी राख का उपयोग नहीं किया जाता है तो 1000 रुपए प्रति टन की दर से शेष अप्रयुक्त मात्रा पर पर्यावरणीय प्रतिकर लगाया जाएगा जिस पर पहले पर्यावरणीय प्रतिकर नहीं लगाया गया है।
- (4) अधिकृत खरीददारों या उपभोक्ता अभिकरणों तक राख भेजने की जिम्मेदारी परिवहकों या वाहन मालिक की जिम्मेदारी है और यदि इसका अनुपालन नहीं किया जाता है, तो अनधिकृत उपयोगकर्ताओं अथवा गैर-अधिकृत उपयोगकर्ताओं को ऐसी मात्रा गलत तरीके से वितरित करने पर 1500 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगायी, इसके अतिरिक्त राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा गैर अनुपालनकर्ता परिवहकों पर अभियोजन लागू होगा।
- (5) इस अधिसूचना के पैरा ख में विहित पर्यावरण अनुकूल तरीके में राख के उपयोग की जिम्मेदारी खरीददार या उपभोगकर्ता एजेंसियों की है और ऐसा नहीं करने पर केन्द्रीय प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा 1500 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा।
- (6) यदि उपयोगकर्ता अधिकरण पैरा ख के अधीन निर्धारित सीमा तक अथवा पैरा घ के उप-पैरा (1) के अधीन, दिए गए नोटिस के माध्यम से सूचित की गई सीमा, इनमें से जो भी कम हो, तक राख का उपयोग नहीं करती है, वे अतिरिक्त राख की मात्रा का 1500 रुपए प्रति टन की दर से भुगतान करने के लिए उत्तरदायी होंगी।
परंतु भवन निर्माण के संबंध में पर्यावरणीय प्रतिकर निर्मित क्षेत्र के 75 रुपये प्रति वर्ग फीट की दर से वसूल किया जाएगा।
- (7) (i) ताप विद्युत संयंत्रों अन्य बकायादारों से केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा लगायी गई का पर्यावरणीय प्रतिकर उपयोग अप्रयुक्त राख के सुरक्षित निपटान हेतु किया जाएगा और राख आधारित उत्पादों सहित राख के उपयोग के संबंध में और अधिक अनुसंधान करने के लिए भी निधि का उपयोग किया जा सकता है।
(ii) अप्रयुक्त मात्रा पर लगाए गए पर्यावरणीय प्रतिकर के पश्चात भी राख के उपयोग का उत्तरदायित्व ताप विद्युत संयंत्रों की होगी और यदि पश्चातवती चक्रों में पर्यावरणीय प्रतिकर लगाने के पश्चात ताप विद्युत संयंत्र, किसी विशेष चक्र की राख के उपयोग के लक्ष्य को प्राप्त करता है तो अगले चक्र के दौरान अप्रयुक्त मात्रा पर एकत्र की गई पर्यावरणीय प्रतिकर में 10 प्रतिशत कटौती के पश्चात उक्त रकम ताप विद्युत संयंत्र को वापस कर दी जाएगी और पश्चातवती चक्रों में राख के उपयोग के मामले में एकत्र की गई पर्यावरणीय प्रतिकर की 20 प्रतिशत, 30 प्रतिशत और उसी क्रम में कटौती की जानी है।

घ. राख या राख आधारित उत्पादों की आपूर्ति हेतु प्रक्रिया .-

- (1) ताप विद्युत संयंत्रों के स्वामी अथवा राख की ईंटों या टाईल्स या धातुमल आधारित राख के विनिर्माता उन व्यक्तियों या अभिकरणों को लिखित सूचना देंगे जो बिक्री या परिवहन या दोनों के लिए प्रस्तुत राख या राख आधारित उत्पादों के उपयोग के लिए उत्तरदायी हैं।
- (2) ऐसे व्यक्ति या उपयोगकर्ता अभिकरणों जिन्हें ताप विद्युत संयंत्रों के स्वामी द्वारा या राख की ईंटों या टाईल्स या धातुमल आधारित राख के उत्पादकों द्वारा सूचना दी गई है, यदि वे पहले ही राख या राख उत्पादों के उपयोग के प्रयोजन से अन्य अभिकरणों के साथ जुड़े हुए हैं, यदि वे किसी भी राख/राख उत्पादों का उपयोग नहीं कर सकते हैं अथवा कम मात्रा का उपयोग कर सकते हैं, तदनुसार ताप विद्युत संयंत्र को सूचित करेंगे।

ड. प्रवर्तन, निगरानी, लेखा परीक्षा और प्रतिवेदन करना

- (1) केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी), उपबंधों के अनुपालना सुनिश्चित करने के लिए प्रवर्तन और निगरानी प्राधिकरण होंगे। सीपीसीबी या एसपीसीबी या पीसीसी तिमाही आधार पर राख के उपयोग की निगरानी करेंगे और सीपीसीबी इस प्रयोजन के लिए अधिसूचना की प्रकाशन की तारीख से छः माह के भीतर एक पोर्टल विकसित करेगा। संबंधित जिला अधिकारी के पास इस अधिसूचना के उपबंधों को लागू करने और निगरानी करने के लिए समवर्ती अधिकारिता होगी।
- (2) (i) ताप विद्युत संयंत्र, राख उत्सर्जन और उपयोग से संबंधित मासिक सूचना वेब पोर्टल पर अगले महीने की 5 तारीख तक अपलोड करेगा। कोयला या लिग्नाइट आधारित ताप ऊर्जा संयंत्रों द्वारा केंद्रीय प्रदूषण नियंत्रण बोर्ड, संबंधित राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति (पीसीसी), केंद्रीय विद्युत प्राधिकरण (सीईए) और पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय के संबंधित एकीकृत क्षेत्रीय कार्यालयों को इस अधिसूचना के उपबंधों के अनुपालन संबंधी सूचना उपलब्ध कराते हुए वार्षिक कार्यान्वयन रिपोर्ट प्रत्येक वर्ष (1 अप्रैल से 31 मार्च तक की अवधि के लिए) अप्रैल माह के 30वें दिन तक प्रस्तुत की जाएगी। सीपीसीबी और सीईए द्वारा सभी ताप विद्युत संयंत्रों द्वारा प्रस्तुत वार्षिक रिपोर्टों का समेकन किया जाएगा और उसे पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को 31 मई तक प्रस्तुत किया जाएगा।
- (ii) सभी अन्य उपयोगकर्ता अधिकरण पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय या राज्य स्तरीय पर्यावरण प्रभाव आकलन प्राधिकरण (एसईआईएए) द्वारा जारी पर्यावरणीय मंजूरी (ईसी) अथवा राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा जारी संचालन की सहमति (सीटीओ), जो भी लागू हो, की अनुपालना रिपोर्ट में इस अधिसूचना में आज्ञापकता के अनुसार राख के उपभोग या उपयोग या निस्तारण तथा राख आधारित उत्पादों के उपयोग संबंधी सूचना प्रस्तुत करेंगे। केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) या राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) अधिसूचना के उपबंधों के प्रभावी कार्यान्वयन की समीक्षा करने हेतु ताप विद्युत संयंत्रों के अतिरिक्त अन्य सभी अधिकरणों की राख उपयोग की वार्षिक रिपोर्ट प्रकाशित करेंगे।
- (3) इस अधिसूचना के उपबंधों की निगरानी और कार्यान्वयन के प्रयोजन के लिए केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति का गठन किया जाएगा जिसके सदस्य विद्युत मंत्रालय, कोयला मंत्रालय, खनन मंत्रालय, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, सड़क परिवहन और राजमार्ग मंत्रालय और भारी उद्यम विभाग से होने के साथ-साथ समिति के अध्यक्ष द्वारा नामित किए जाने वाले कोई संबंधित पणधारी होंगे। यह समिति संगत पणधारी को आमंत्रित कर सकती है। यह समिति इस अधिसूचना के उपबंधों के प्रभावी और दक्ष कार्यान्वयन के लिए सिफारिशें कर सकती है। यह समिति छः माह में कम से कम एक बार एक बैठक करेगी और वार्षिक कार्यान्वयन रिपोर्टों की समीक्षा करेगी और यह समिति, इस अधिसूचना द्वारा आज्ञापक किए गए अनुसार छः महीनों में कम से कम एक बार संगत पणधारी (को) को आमंत्रित करके राख के उपयोग की निगरानी करने के लिए पणधारी से साथ परामर्शदात्री बैठकें आयोजित करेगी। यह समिति पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफसीसी) को छः मासिक रिपोर्ट प्रस्तुत करेगी।

- (4) ताप विद्युत संयंत्रों और राख के उपयोगकर्ताओं या राख आधारित उत्पादों के विनिर्माताओं के बीच के विवाद का समाधान करने के प्रयोजन से राज्य सरकारें या संघ राज्यक्षेत्र की सरकारें इस अधिसूचना के प्रकाशन की तारीख से तीन माह के भीतर राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) की अध्यक्षता में एक समिति का गठन करेंगी जिसमें विद्युत विभाग के प्रतिनिधि और एक प्रतिनिधि उस विभाग का होगा, जो विवाद वाले संबंधित अभिकरण का कार्य देख रहे हैं।
- (5) केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) द्वारा प्राधिकृत लेखा परीक्षकों द्वारा ताप विद्युत संयंत्रों और उपयोगकर्ता अभिकरणों द्वारा किए गए राख के निपटान की अनुपालन लेखा परीक्षा संचालित की जाएगी और लेखा परीक्षा की रिपोर्ट प्रत्येक वर्ष 30 नवम्बर तक केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को प्रस्तुत की जाएगी। केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) लेखा परीक्षा की रिपोर्ट प्राप्त होने के पंद्रह दिनों के भीतर अनुपालन न करने वाले ताप विद्युत संयंत्रों के विरुद्ध कार्रवाई प्रारंभ करेंगे।

[फा. सं. एचएसएम-9/1/2019-एचएसएम]

नरेश पाल गंगवार, संयुक्त सचिव

उपाबंध

31 मई तक अथवा उससे पहले प्रस्तुत की जाने वाली राख संबंधी उपबंधों की अनुपालन रिपोर्ट (01 अप्रैल से 31 मार्च की अवधि के लिए)।

क्र.सं.	ब्यौरा	
1.	विद्युत संयंत्र का नाम	
2.	कंपनी का नाम	
3.	जिला	
4.	राज्य	
5.	पत्राचार के लिए डाक का पता :	
6.	ई-मेल :	
7.	विद्युत संयंत्र की संस्थापित क्षमता (मेगा वॉट) :	
8.	संयंत्र लोड फैक्टर (पीएलएफ) :	
9.	उत्पादित यूनिटों की संख्या (एमडब्ल्यूएच) :	
10.	विद्युत संयंत्र के अंतर्गत कुल क्षेत्र (हेक्टेयर) (राख कुंडों के अधीन क्षेत्र सहित) :	
11.	रिपोर्टिंग की अवधि के दौरान कोयला खपत की मात्रा (प्रति वर्ष मीट्रिक टन) :	
12.	औसत राख सामग्री प्रतिशतता में (%) :	
13.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख की मात्रा (प्रति वर्ष मीट्रिक टन) : फ्लाय राख (प्रति वर्ष मीट्रिक टन) : बॉटम राख (प्रति वर्ष मीट्रिक टन) :	
14.	ड्राई फ्लाय राख भंडारण गड्ढा (गड्ढों) की क्षमता (मीट्रिक टन) :	
15.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख के उपयोग का ब्यौरा: (क) रिपोर्टिंग की अवधि के दौरान वर्तमान में उपयोग की गई राख की	

	<p>कुल मात्रा (एमटीपीए) :</p> <p>(ख) उपयोग की गई फ्लाई राख की मात्रा (एमटीपीए) :</p> <ol style="list-style-type: none"> i. फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड/पैनल) : ii. सीमेंट विनिर्माण : iii. रेडी मिक्स कंक्रीट : iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : v. सिंटेड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : vi. सड़कों, सड़क और फ्लाई ओवर के पुशतों का निर्माण : vii. बांधों का निर्माण : viii. निम्न भू-क्षेत्र का भराव : ix. खनिज क्षेत्रों का भराव : x. अधिभार वाले डम्पों में उपयोग : xi. कृषि : xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : xiii. अन्य देशों को राख का निर्यात : xiv. अन्य (कृपया विनिर्दिष्ट करें) : <p>(ग) उपयोग किए गए तल के राख की मात्रा (एमटीपीए) :</p> <ol style="list-style-type: none"> i. फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड या पैनल) : ii. सीमेंट विनिर्माण : iii. रेडी मिक्स कंक्रीट : iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : v. सिंटेड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : vi. सड़कों, सड़क और फ्लाईओवर के पुशतों का निर्माण : vii. बांधों का निर्माण : viii. निम्न भू-क्षेत्र का भराव : ix. खनिज क्षेत्रों का भराव : x. अधिभार वाले डम्पों में उपयोग : xi. कृषि : xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : xiii. अन्य देशों को राख का निर्यात : xiv. अन्य (कृपया विनिर्दिष्ट करें) : <p>रिपोर्टिंग की अवधि के दौरान वर्तमान में अप्रयुक्त राख की कुल मात्रा (एमटीपीए) :</p>	
16.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख का प्रतिशतता उपयोग (%) :	
17.	<p>राख कुण्डों में राख के निपटान का ब्यौरा</p> <p>क) तारीख 31 मार्च तक (रिपोर्टिंग की अवधि को छोड़कर) राख कुण्ड (कुण्डों) में निपटान किए गए राख की कुल मात्रा (मीट्रिक टन):</p>	

	<p>ख) रिपोर्टिंग की अवधि के दौरान राख कुण्ड (कुण्डों) में निपटान किए गए राख की मात्रा (मीट्रिक टन):</p> <p>ग) रिपोर्टिंग की अवधि के दौरान राख कुण्डों में गारा निस्सरण हेतु खपत हुए जल की कुल मात्रा (मी³):</p> <p>घ) राख कुण्डों की कुल संख्या:</p> <p>(i) सक्रिय:</p> <p>(ii) खाली किए गए (पुनः भरा जाना है)</p> <p>(iii) पुनः भरे गए:</p> <p>ड.) राख कुण्डों के अधीन कुल क्षेत्र (हेक्टेयर):</p>	
18.	<p>अलग-अलग राख कुण्ड का ब्यौरा</p> <p>राख कुण्ड 1,2 आदि (यदि राख कुण्डों की संख्या एक से अधिक हो, तो कृपया निम्नलिखित ब्यौरा अलग से उपलब्ध कराएं)</p> <p>क) स्थिति: निर्माणाधीन या सक्रिय या खाली किया गया या पुनः भरा गया</p> <p>ख) राख कुण्ड में राख का निपटान शुरू करने की तारीख/महीना/वर्ष या महीना/वर्ष):</p> <p>ग) राख कुण्ड की क्षमता पूर्ण किए जाने के पश्चात् उसमें राख निपटान रोकने की तारीख</p> <p>(तारीख/महीना/वर्ष या महीना/वर्ष):</p> <p>(सक्रिय राख कुण्डों के लिए लागू नहीं)</p> <p>ग) क्षेत्र (हेक्टेयर):</p> <p>घ) डाइक की ऊंचाई (मी.):</p> <p>घ) आयतन (मी³):</p> <p>ड.) तारीख 31 मार्च तक निपटान किए गए राख की मात्रा (मीट्रिक टन):</p> <p>च) उपलब्ध आयतन का प्रतिशत (%) और आगे निपटान किए जा सकने वाले राख की मात्रा (मीट्रिक टन):</p> <p>छ) राख कुण्ड के भरे जाने की अनुमानित अवधि (वर्षों और महीनों की संख्या):</p> <p>ड.) निर्देशांक (अक्षांश और देशान्तर):</p> <p>(कृपया न्यूनतम 4 निर्देशांकों को विनिर्दिष्ट करें)</p> <p>ज) राख कुण्ड में की गई लाइनिंग का प्रकार: एचडीपीई लाइनिंग या एलडीपीई लाइनिंग या क्ले लाइनिंग या कोई लाइनिंग नहीं</p> <p>छ) निपटान की विधि: शुष्क निपटान या नम गारा (नम गारा के मामले में कृपया विनिर्दिष्ट करें कि क्या एचसीएसडी या एमसीएसडी या एलसीएसडी है)</p> <p>ज) राख का अनुपात: गारा मिश्रण में जल (1:___):</p> <p>झ) संस्थापित और कार्यशील राख जल पुनर्चक्रण प्रणाली (एडब्ल्यूआरएस): हां या नहीं</p> <p>ञ) जमीन के अंदर या जल निकाय में राख कुण्ड से निस्सरित अपशिष्ट जल की मात्रा (मी³):</p> <p>ट) डाइक की स्थिरता का अध्ययन कराए जाने की पिछली तारीख और उस संगठन का नाम जिसने अध्ययन किया:</p> <p>ठ) लेखा-परीक्षा किए जाने की पिछली तारीख और उस संगठन का नाम जिसने लेखा-परीक्षा की:</p>	
19.	<p>उपयोग किए गए पुराने राख की मात्रा (एमटीपीए):</p> <p>i. फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर</p>	

	सीमेंट शीट या पाइप या बोर्ड या पैनल):			
	ii. सीमेंट विनिर्माण:			
	iii. रेडी मिक्स कंक्रीट:			
	iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री:			
	v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण:			
	vi. सड़कों, सड़क और फ्लाई ओवर के पुश्तों का निर्माण:			
	vii. बांधों का निर्माण:			
	viii. निम्न भू-क्षेत्र का भराव:			
	ix. खनिज क्षेत्रों का भराव:			
	x. अधिभार वाले डम्पों में उपयोग:			
	xi. कृषि:			
	xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण:			
	xiii. अन्य देशों को राख का निर्यात			
	xiv. अन्य (कृपया विनिर्दिष्ट करें):			
20.	सार :			
	व्यौरा	सृजित मात्रा (एमटीपी)	उपयोग की गई मात्रा (एमटीपी) और (%)	शेष मात्रा (एमटीपी)
	रिपोर्टिंग की अवधि के दौरान राख			
	पुरानी राख			
	कुल			
21.	कोई अन्य सूचना : वार्षिक अनुपालन रिपोर्ट, और विद्युत संयंत्रों और राख कुण्डों की शेष फाइलों की सॉफ्ट कॉपी ई-मेल:- moefcc- coalash@gov.in पर भेजी जाए।			
22.	प्राधिकृत हस्ताक्षरकर्ता के हस्ताक्षर			

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 31st December, 2021

S.O. 5481(E).—Whereas by notification of the Government of India in the erstwhile Ministry of Environment and Forests *vide* S.O.763 (E), dated the 14th September, 1999, as amended from time to time, the Central Government, issued directions for restricting the excavation of top soil for manufacturing of bricks and promoting the utilisation of fly ash in the manufacturing of building materials and in construction activity within a specified radius of three hundred kilometres from the coal or lignite based thermal power plants;

And whereas, to implement the aforesaid notification more effectively based on the polluter pays principle (PPP) thereby ensuring 100 per cent utilisation of fly ash by the coal or lignite based thermal power plants and for the sustainability of the fly ash management system, the Central Government reviewed the existing notification; and whereas environmental compensation needs to be introduced based on the polluter pays principle;

And whereas, there is a need to conserve top soil by promoting manufacture and mandating use of ash based products and building materials in the construction sector;

And whereas, there is a need to conserve top soil and natural resources by promoting utilisation of ash in road laying, road and flyover embankments, shoreline protection measures, low lying areas of approved projects, backfilling of mines, as an alternative for filling of earthen materials;

And whereas, it is necessary to protect the environment and prevent the dumping and disposal of fly ash discharged from coal or lignite based thermal power plants on land;

And whereas, in the said notification the phrase 'ash', has been used which includes both fly ash as well as bottom ash generated from the Coal or Lignite based thermal power plants;

And whereas, the Central Government intends to bring out a comprehensive framework for ash utilisation including system of environmental compensation based on polluter pays principle;

And whereas, a draft notification on ash utilisation by coal or lignite thermal power plants in supersession of the notification of the Government of India, Ministry of Environment and Forests published in the Gazette of India, Extra Ordinary part II, section 3, sub-section (i) *vide* S.O.763 (E), dated the 14th September, 1999, by notification in exercise of the powers conferred under sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, was published in the Gazette of India, Extraordinary, Part II, section 3, sub-section (i), *vide* G.S.R. 285(E), dated the 22nd April, 2021 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of sixty days from the date on which copies of the Gazette containing the said draft provisions were made available to the public;

And, whereas all the objections and suggestions received from all persons likely to be affected thereby in respect of the said draft notification have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, and in supersession of the Notification S.O.763 (E), dated the 14th September, 1999 except as respect things done or omitted to be done before such supersession, the Central Government hereby issues the following notification on ash utilisation from coal or lignite thermal power plants which shall come into force on the date of the publication of this notification, namely:-

A. Responsibilities of thermal power plants to dispose fly ash and bottom ash.—

- (1) Every coal or lignite based thermal power plant (including captive or co-generating stations or both) shall be primarily responsible to ensure 100 per cent utilisation of ash (fly ash, and bottom ash) generated by it in an eco-friendly manner as given in sub-paragraph (2);
- (2) The ash generated from coal or lignite based thermal power plants shall be utilised only for the following eco-friendly purposes, namely:-
 - (i) Fly ash based products viz. bricks, blocks, tiles, fibre cement sheets, pipes, boards, panels;
 - (ii) Cement manufacturing, ready mix concrete;
 - (iii) Construction of road and fly over embankment, Ash and Geo-polymer based construction material;
 - (iv) Construction of dam;
 - (v) Filling up of low lying area;
 - (vi) Filling of mine voids;
 - (vii) Manufacturing of sintered or cold bonded ash aggregate;
 - (viii) Agriculture in a controlled manner based on soil testing;
 - (ix) Construction of shoreline protection structures in coastal districts;

- (x) Export of ash to other countries;
- (xi) Any other eco-friendly purpose as notified from time to time.
- (3) A committee shall be constituted under the chairmanship of Chairman, Central Pollution Control Board (CPCB) and having representatives from Ministry of Environment, Forest and Climate Change (MoEFCC), Ministry of Power, Ministry of Mines, Ministry of Coal, Ministry of Road Transport and Highways, Department of Agricultural Research and Education, Institute of Road Congress, National Council for Cement and Building Materials, to examine and review and recommend the eco-friendly ways of utilisation of ash and make inclusion or exclusion or modification in the list of such ways as mentioned in Sub-paragraph (2) based on technological developments and requests received from stakeholders. The committee may invite State Pollution Control Board or Pollution Control Committee, operators of thermal power plants and mines, cement plants and other stakeholders as and when required for this purpose. Based on the recommendations of the Committee, Ministry of Environment, Forest and Climate Change (MoEFCC) may publish such eco-friendly purpose.
- (4) Every coal or lignite based thermal power plant shall be responsible to utilise 100 per cent ash (fly ash and bottom ash) generated during that year, however, in no case shall utilisation fall below 80 per cent in any year, and the thermal power plant shall achieve average ash utilisation of 100 per cent in a three years cycle:

Provided that the three years cycle applicable for the first time is extendable by one year for the thermal power plants where ash utilisation is in the range of 60-80 per cent, and two years where ash utilisation is below 60 per cent and for the purpose of calculation of percentage of ash utilisation, the percentage quantity of utilisation in the year 2021- 2022 shall be taken into account as per the table below:

Utilisation percentages of thermal power plants	First compliance Cycle to meet 100 per cent utilisation	Second compliance cycle onwards, to meet 100 per cent utilisation
>80 per cent	3 years	3 years
60-80 per cent	4 years	3 years
<60 per cent	5 years	3 years

Provided further that the minimum utilisation percentage of 80 per cent shall not be applicable to the first year and first two years of the first compliance cycle for the thermal power plants under the utilisation category of 60-80 per cent and <60 per cent, respectively.

Provided also that 20per cent of ash generated in the final year of compliance cycle may be carried forward to the next cycle which shall be utilised in the next three years cycle along with the ash generated during that cycle.

- (5) The unutilised accumulated ash i.e. legacy ash, which is stored before the publication of this notification, shall be utilised progressively by the thermal power plants in such a manner that the utilization of legacy ash shall be completed fully within ten years from the date of publication of this notification and this will be over and above the utilisation targets prescribed for ash generation through current operations of that particular year:

Provided that the minimum quantity of legacy ash in percentages as mentioned below shall be utilised during the corresponding year and the minimum quantity of legacy ash is to be calculated based on the annual ash generation as per installed capacity of thermal power plant.

Year from date of publication	1 st	2 nd	3 rd -10 th
Utilisation of legacy ash (in percentage of Annual ash)	At least 20 per cent	At least 35 per cent	At least 50 per cent

Provided further that the legacy ash utilisation shall not be required where ash pond or dyke has stabilised and the reclamation has taken place with greenbelt or plantation and the concerned State Pollution Control Board shall certify in this regard. Stabilisation and reclamation of an ash pond or dyke including certification by the Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be carried out within a year from the date of publication of this notification. The ash remaining in all other ash ponds or dykes shall be utilised in progressive manner as per the above mentioned timelines.

Note: The obligations under sub-paragraph (4) and (5) above for achieving the ash utilisation targets shall be applicable from 1st April, 2022.

- (6) Any new as well as operational thermal power plant may be permitted an emergency or temporary ash pond with an area of 0.1 hectare per Mega Watt (MW). Technical specifications of ash ponds or dykes shall be as per the guidelines of Central Pollution Control Board (CPCB) made in consultation with Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the ash pond or dyke on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and greenbelt, etc., and shall be put in place within three months from the date of publication of this notification.
- (7) Every coal or lignite based thermal power plant shall ensure that loading, unloading, transport, storage and disposal of ash is done in an environmentally sound manner and that all precautions to prevent air and water pollution are taken and status in this regard shall be reported to the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) in Annexure attached to this notification.
- (8) Every coal or lignite based thermal power plant shall install dedicated silos for storage of dry fly ash silos for at least sixteen hours of ash based on installed capacity and it shall be reported upon to the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) in the Annexure and shall be inspected by Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) from time to time.
- (9) Every coal or lignite based thermal power plant (including captive or co-generating stations or both) shall provide real time data on daily basis of availability of ash with Thermal Power Plant (TPP), by providing link to Central Pollution Control Board's web portal or mobile phone App for the benefit of actual user(s).
- (10) Statutory obligation of 100 per cent utilisation of ash shall be treated as a change in law, wherever applicable.

B. For the purpose of utilisation of ash, the subsequent sub-paras shall apply.—

- (1) All agencies (Government, Semi-government and Private) engaged in construction activities such as road laying, road and flyover embankments, shoreline protection structures in coastal districts and dams within 300 kms from the lignite or coal based thermal power plants shall mandatorily utilise ash in these activities:

Provided that it is delivered at the project site free of cost and transportation cost is borne by such coal or lignite based thermal power plants.

Provided further that thermal power plant may charge for ash cost and transportation as per mutually agreed terms, in case thermal power plant is able to dispose the ash through other means and those agencies makes a request for it and the provisions of ash free of cost and free transportation shall be applicable, if thermal power plant serves a notice on the construction agency for the same.

- (2) The utilisation of ash in the said activities shall be carried out in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Road Congress, Central Building Research Institute, Roorkee, Central Road Research Institute, Delhi, Central Public Works Department, State Public Works Departments and other Central and State Government Agencies.

- (3) It shall be obligatory on all mines located within 300 kilometres radius of thermal power plant, to undertake backfilling of ash in mine voids or mixing of ash with external Overburden dumps, under Extended Producer Responsibility (EPR). All mine owners or operators (Government, Public and Private Sector) within three hundred kilometres (by road) from coal or lignite based thermal power plants, shall undertake measures to mix at least 25 per cent of ash on weight to weight basis of the materials used for external dump of overburden, backfilling or stowing of mine (running or abandoned as the case may be) as per the guidelines of the Director General of Mines Safety (DGMS):

Provided that such thermal power stations shall facilitate the availability of required quantity of ash by delivering ash free of cost and bearing the cost of transportation or cost of transportation arrangement decided on mutually agreed terms and mixing of ash with overburden in mine voids and dumps shall be applicable for the overburden generated from the date of publication of this notification and the utilisation of ash in the said activities shall be carried out in accordance with guidelines laid down by the Central Pollution Control Board, Director General of Mines Safety and Indian Bureau of Mines.

Explanation.- For the purpose of this sub-paragraph, it is also clarified that the provisions of ash free of cost and free transportation shall be applicable, if thermal power plants serve a notice on the mine owner for the same and the mandate of using 25 per cent of ash for mixing with overburden dump and filling up of mine voids shall not be applicable unless a notice is served on the mine owner by thermal power plant.

- (4) (i) All mine owners shall get mine closure plans (progressive and final) to accommodate ash in the mine voids and the concerned authority shall approve mine plans for disposal of ash in mine voids and mixing of ash with overburden dumps. The Ministry of Environment, Forest and Climate Change (MoEFCC) has issued guidelines on 28th August, 2019 regarding exemption of requirement of Environmental Clearance of thermal power plants and coal mines along with the guidelines to be followed for such disposal.
- (ii) The Ministry in consultation with Central Pollution Control Board (CPCB), Director General of Mine Safety (DGMS) and Indian Bureau of Mines (IBM) may issue further guidelines time to time to facilitate ash disposal in mine voids and mixing with overburden dumps and it shall be the responsibility of mine owners to get the necessary amendments or modifications in the permissions issued by various regulatory authorities within one year from the date of identification of such mines.
- (5) (i) There shall be a committee headed by Chairperson, Central Pollution Control Board (CPCB) with representatives from Ministry of Environment, Forest and Climate Change, Ministry of Power, Ministry of Mines, Ministry of Coal, Director General of Mine Safety and Indian Bureau of Mines for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump including examination of safety, feasibility (not economic feasibility) and aspects of environmental contamination and the committee shall get updated quarterly reports prepared regarding identified mines (both underground and opencast) for the stakeholder Ministries or Departments and the committee shall start identifying the suitable mines immediately after the publication of this notification.
- (ii) Thermal power plants or mines shall not wait for disposal of ash till the identification is done by the above mentioned committee, to meet the utilisation targets mandated as above.
- (6) Filling of low lying areas with ash shall be carried out with prior permission of the State Pollution Control Board or Pollution Control Committee for approved projects, and in accordance with guidelines laid down by Central Pollution Control Board (CPCB) and the State Pollution Control Board or Pollution Control Committee (PCC) shall publish approved sites, location, area and permitted quantity annually on its website.
- (7) Central Pollution Control Board after engaging relevant stakeholders, shall put in place the guidelines within one year for all types of activities envisaged under this notification including putting in place time bound online application process for the grant permission by State Pollution Control Boards (SPCBs) or Pollution Control Committees (PCCs).

- (8) All building construction projects (Central, State and Local authorities, Govt. undertakings, other Govt. agencies and all private agencies) located within a radius of three hundred kilometres from a coal or lignite based thermal power plant shall use ash bricks, tiles, sintered ash aggregate or other ash based products, provided these are made available at prices not higher than the price of alternative products.
- (9) Manufacturing of ash based products and use of ash in such products shall be in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Road Congress, and Central Pollution Control Board.

C. Environmental compensation for non-compliance.—

- (1) In the first two years of a three years cycle, if the coal or lignite based thermal power plant (including captive or co-generating stations or both) has not achieved at least 80 per cent ash (fly ash and bottom ash) utilisation, then such non-compliant thermal power plants shall be imposed with an environmental compensation of Rs. 1000 per ton on unutilised ash during the end of financial year based on the annual reports submitted and if it is unable to utilise 100 per cent of ash in the third year of the three years cycle, it shall be liable to pay an environmental compensation of Rs. 1000 per ton on the unutilised quantity on which environmental compensation has not been imposed earlier:

Provided that the environmental compensation shall be estimated and imposed at the end of last year of the first compliance cycle as per the various utilisation categories as mentioned in sub-paragraph (4) of Para A.

- (2) Environmental compensation collected by the authorities shall be deposited in the designated account of Central Pollution Control Board.
- (3) In case of legacy ash, if the coal or lignite based thermal power plant (including captive or co-generating stations or both) has not achieved utilisation equivalent to at least 20 per cent (for the first year), 35 per cent (for the second year), 50 per cent (for third to tenth year) of ash generated based on installed capacity, an environmental compensation of Rs. 1000 per ton of unutilised legacy ash during that financial year shall be imposed and if the utilization of legacy ash is not completed at the end of 10 years, an environmental compensation of Rs.1000 per ton shall be imposed on the remaining unutilised quantity which has not been imposed earlier.
- (4) It shall be the responsibility of the transporters or vehicle owner to deliver ash to authorised purchaser or user agency and if it is not complied, then an environmental compensation of Rs. 1500 per ton on such quantity as mis-delivered to unauthorised users or non- delivered to authorised users will be imposed besides prosecution of such non-compliant transporters by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC).
- (5) It is the responsibility of the purchasers or user agencies to utilise ash in an eco-friendly manner as laid down at para B of this notification and if it is not complied, then an environmental compensation of Rs. 1500 per ton shall be imposed by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC).
- (6) If the user agencies do not utilise ash to the extent obligated under para B or the extent to which they have been intimated through Notice(s) served under sub-paragraph (1) of para D, whichever is lower, they shall be liable to pay Rs. 1500 per ton of ash for the quantity they fall short off:

Provided that the environmental compensation on building constructions shall be levied at Rs.75/- per square feet of built up area of construction.

- (7) (i) The environmental compensation collected by Central Pollution Control Board from the thermal power plants and other defaulters shall be used towards the safe disposal of the unutilised ash and the fund may also be utilised for advancing research on use of ash including ash based products.

(ii) The liability of ash utilisation shall be with thermal power plants even after imposition of environmental compensation on unutilised quantities and in case thermal power plant achieves the ash utilisation of any

particular cycle after imposition of environmental compensation in subsequent cycles, the said amount shall be returned to thermal power plant after deducting 10 per cent of the environmental compensation collected on the unutilised quantity during the next cycle and deduction of 20 per cent, 30 per cent, and so on, of the environmental compensation collected is to be made in case of utilisation of ash in subsequent cycles.

D. Procedure for supply of ash or ash based products.—

- (1) The owner of thermal power plants or manufacturers of ash bricks or tiles or sintered ash aggregate shall serve written notice to persons or agencies who are liable to utilise ash or ash based products, offering for sale, or transport or both.
- (2) Persons or user agencies who have been served notices by owner of thermal power plants or manufacturers of ash bricks or tiles or sintered ash aggregate, if they have already tied up with other agencies for the purpose of utilisation of ash or ash products, shall inform the thermal power plant accordingly, if they cannot use any ash or ash products or use reduced quantity.

E. Enforcement, Monitoring, Audit and Reporting.—

- (1) The Central Pollution Control Board (CPCB) and the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be the enforcing and monitoring authority for ensuring compliance of the provisions and shall monitor the utilisation of ash on quarterly basis. Central Pollution Control Board shall develop a portal for the purpose within six months of date of publication of the notification. The concerned District Magistrate shall have concurrent jurisdiction for enforcement and monitoring of the provisions of this notification.
- (2) (i) Thermal power plants shall upload monthly information regarding ash generation and utilisation by 5th of the next month on the web portal. Annual implementation report (for the period 1st April to 31st March) providing information about the compliance of provisions in this notification shall be submitted by the 30th day of April, every year to the Central Pollution Control Board, concerned State Pollution Control Board or Pollution Control Committee (PCC), Central Electricity Authority (CEA), and concerned Integrated Regional Office of Ministry of Environment, Forest and Climate Change by the coal or lignite based thermal power plants. Central Pollution Control Board and Central Electricity Authority shall compile the annual reports submitted by all the thermal power plants and submit to Ministry of Environment, Forest and Climate Change by 31st May.
 - (ii) All other user agencies shall submit consumption or utilisation or disposal of ash and use of ash based products as mandated in this notification in the compliance report of Environmental Clearance (EC) issued by Ministry of Environment, Forest and Climate Change or State Level Environment Impact Assessment Authority (SEIAA) or Consent to Operate (CTO) issued by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC), whichever is applicable. The Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall publish annual report of ash utilisation of all other agencies except thermal power plants to review the effective implementation of the provisions of the notification.
- (3) For the purpose of monitoring the implementation of the provisions of this notification, a committee shall be constituted under the Chairperson, Central Pollution Control Board (CPCB), with members from Ministry of Power, Ministry of Coal, Ministry of Mines, Ministry of Environment, Forest and Climate Change, Ministry Road Transportation and Highways, Department of Heavy Industry as well as any concerned stakeholder(s), to be nominated by the Chairman of the committee. The committee may make recommendations for effective and efficient implementation of the provisions of the notification. The committee shall meet at least once in six months and review annual implementation reports and the committee shall also hold stakeholder consultations for monitoring of ash utilisation as mandated by this notification by inviting relevant stakeholder(s) at least once in six months. The committee shall submit the six monthly report to Ministry of Environment, Forest and Climate Change (MoEFCC).

- (4) For the purpose of resolving disputes between thermal power plants and users of ash or manufacturer of ash based products, the State Governments or Union territory administration constitute a Committee within three months from the date of publication of this notification under the Chairman, State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) with representatives from Department of Power, and one representative from the Department which deals with the subject of concerned agency with which dispute is made.
- (5) The compliance audit for ash disposal by the thermal power plants and the user agency shall be conducted by auditors, authorised by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report.

[F. No. HSM-9/1/2019-HSM]

NARESH PAL GANGWAR, Jt. Secy.

Annexure

Ash Compliance Report (for the period 1st April-31st March) to be submitted on or before 31st May.

Sl. No.	Details	
1.	Name of Power Plant	
2.	Name of the company	
3.	District	
4.	State	
5.	Postal address for communication:	
6.	E-mail:	
7.	Power Plant installed capacity (MW):	
8.	Plant Load Factor (PLF):	
9.	No. of units generated (MWh):	
10.	Total area under power plant (ha): (including area under ash ponds)	
11.	Quantity of coal consumption during reporting period (Metric Tons per Annum):	
12.	Average ash content in percentage (per cent):	
13.	Quantity of current ash generation during reporting period (Metric Tons per Annum): Fly ash (Metric Tons per Annum): Bottom ash (Metric Tons per Annum):	
14.	Capacity of dry fly ash storage silo(s) (Metric Tons) :	
15.	Details of utilisation of current ash generated during reporting period (a) Total quantity of current ash utilised (MTPA) during reporting period: (b) Quantity of fly ash utilised (MTPA): (i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels) (ii) Cement manufacturing:	

	<ul style="list-style-type: none"> (iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and fly over embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts; (xiii) Export of ash to other countries: (xiv) Others (please specify): <p>(c) Quantity of bottom ash utilised (MTPA):</p> <ul style="list-style-type: none"> (i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): (ii) Cement manufacturing: (iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and flyover embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts: (xiii) Export of ash to other countries: (xiv) Others (please specify): <p>Total quantity of current ash unutilised (MTPA) during reporting period:</p>	
16.	Percentage utilisation of current ash generated during reporting period (per cent):	
17.	<p>Details of disposal of ash in ash ponds</p> <p>(a) Total quantity of ash disposed in ash pond(s) (Metric Tons) as on 31st March (excluding reporting period):</p> <p>(b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons):</p> <p>(c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m³):</p> <p>(d) Total number of ash ponds:</p> <ul style="list-style-type: none"> (i) Active: (ii) Exhausted (yet to be reclaimed): (iii) Reclaimed: <p>(e) total area under ash ponds (ha):</p>	
18.	<p>Individual ash pond details</p> <p><i>Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one)</i></p> <p>(a) Status: Under construction or Active or Exhausted or</p>	

	<p>Reclaimed</p> <p>(b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY):</p> <p>(c) Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds)</p> <p>(c) area (hectares):</p> <p>(d) dyke height (m):</p> <p>(d) volume (m³):</p> <p>(e) quantity of ash disposed as on 31st March (Metric Tons):</p> <p>(f) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons):</p> <p>(g) expected life of ash pond (number of years and months):</p> <p>(e) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates)</p> <p>(f) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining</p> <p>g) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD)</p> <p>(h) Ratio of ash: water in slurry mix (1:___):</p> <p>(i) Ash water recycling system (AWRS) installed and functioning: Yes or No</p> <p>(j) Quantity of wastewater from ash pond discharged into land or water body (m³):</p> <p>(k) Last date when the dyke stability study was conducted and name of the organisation who conducted the study:</p> <p>(l) Last date when the audit was conducted and name of the organisation who conducted the audit:</p>									
19.	<p>Quantity of legacy ash utilised (MTPA):</p> <ol style="list-style-type: none"> i. Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): ii. Cement manufacturing: iii. Ready mix concrete: iv. Ash and Geo-polymer based construction material: v. Manufacturing of sintered or cold bonded ash aggregate: vi. Construction of roads, road and flyover embankment: vii. Construction of dams: viii. Filling up of low lying area: ix. Filling of mine voids: x. Use in overburden dumps: xi. Agriculture: xii. Construction of shoreline protection structures in coastal districts; xiii. Export of ash to other countries: xiv. Others (please specify): 									
20.	<table border="1"> <tr> <td colspan="4" data-bbox="268 1935 1433 1980">Summary:</td> </tr> <tr> <td data-bbox="268 1980 568 2054">Details</td> <td data-bbox="568 1980 868 2054">Quantity generated (MTP)</td> <td data-bbox="868 1980 1152 2054">Quantity utilised (MTP) and (per cent)</td> <td data-bbox="1152 1980 1433 2054">Balance quantity (MTP)</td> </tr> </table>	Summary:				Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)	
Summary:										
Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)							

	Current ash during reporting period			
	Legacy ash			
	Total			
21.	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcc-coalash@gov.in			
22.	Signature of Authorised Signatory			



भारत का राजपत्र The Gazette of India

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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित
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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 30 दिसम्बर, 2022

का.आ. 6169(अ).—पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय में भारत सरकार ने पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए भारत के राजपत्र, असाधारण, भाग II, खंड 3 उप खंड (ii) का.आ. 5481(अ), तारीख 31 दिसंबर, 2021 द्वारा एक अधिसूचना जारी की थी (जिन्हें इसमें इसके पश्चात इसे राख के उपयोग से संबंधित अधिसूचना कहा गया है);

और, राख के उपयोग से संबंधित अधिसूचना के उपबंधों के कार्यान्वयन के संबंध में विद्युत मंत्रालय, ताप विद्युत संयंत्रों और विभिन्न हितधारकों से अनुरोध प्राप्त हुए हैं;

और, राख के उपयोग से संबंधित अधिसूचना के कार्यान्वयन में सुचारू परिवर्तन लाने हेतु उक्त अधिसूचना के कतिपय उपबंधों में संशोधन लाना उचित है;

अतः अब, केन्द्रीय सरकार पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (1), (2) और (4) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, जारी राख के उपयोग संबंधी अधिसूचना में निम्नलिखित संशोधन करती है, अर्थात्:-

जारी राख के उपयोग से संबंधित अधिसूचना में संशोधन –

1. पैरा क में, -

(i) उप पैरा क (4) में, तीसरे परंतुक के पश्चात निम्नलिखित परन्तुक अंतर्विष्ट किया जाएगा, अर्थात् :

“परन्तु, यह भी कि इस अधिसूचना के प्रकाशन की तारीख को अथवा उसके पश्चात् स्थापित नए ताप विद्युत संयंत्र सारणी में यथा विनिर्दिष्ट 60 प्रतिशत से कम ताप विद्युत संयंत्रों के लिए विनिर्दिष्ट अनुपालन चक्र के समान प्रथम अनुपालन चक्र का अनुसरण करेंगे।

टिप्पण : लागू अनुपालन चक्र के अनुसार उपयोग के लक्ष्य 1 अप्रैल, 2022 से प्रभावी होंगे।”

(ii) उप पैरा 5 में, -

(क) आरंभिक पैरा में, “इस अधिसूचना के प्रकाशन की तारीख” शब्दों के स्थान पर “1 अप्रैल, 2022” उक्त अक्षर और शब्द रखे जाएंगे;

(ख) दूसरे परंतुक में, -

(i) “हरित पट्टी या पौधरोपण” के पश्चात, “या उप पैरा (6) में यथा विनिर्दिष्ट केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) द्वारा जारी मार्गदर्शी सिद्धांतों के अनुसार सौर ऊर्जा संभव या पवन ऊर्जा संयंत्र” शब्द कोष्ठकों और अक्षरों को अंतःस्थापित किए जाएंगे;

(ii) “केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) या” शब्द कोष्ठक और अक्षर हटा दिया जाएगा।

(iii) “एक वर्ष” शब्दों के स्थान पर “तीन वर्ष” शब्दों को रखा जाएगा।

(iv) “इस अधिसूचना के प्रकाशन की तारीख” शब्दों के स्थान पर “1 अप्रैल, 2022” उक्त अक्षर और शब्द रखे जाएंगे;

(ग) दूसरे परंतुक के पश्चात निम्नलिखित उपलब्ध अंतःस्थापित किया जाएगा, अर्थात् :

“परंतु कि पैरा क (6) में यथाविनिर्दिष्ट राख के अस्थायी भंडारण हेतु अभिहित किए गए संचालित राख कुंड या डाइक के सिवाय सभी राख कुंडों या डाइक में संग्रहीत राख में पुरानी राख एकत्रित होगी और या तो इसे पुनःप्राप्त या स्थिर या उपयोग करना होगा।”

(iii) उप पैरा (6) के स्थान, उप पैरा रखा जाएगा, अर्थात्:

“(6) किसी भी नए और साथ ही चालू थर्मल पावर प्लांट को 0.1 हेक्टेयर प्रति मेगा वाट (मेगावाट) के क्षेत्र में राख के अस्थायी भंडारण के लिए परिचालन राख तालाब या डाइक की अनुमति दी जा सकती है। केन्द्रीय विद्युत प्राधिकरण के परामर्श से बनाए गए केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) के दिशा-निर्देशों के अनुसार परिचालन के साथ-साथ स्थिर और पुनः दावा किए गए राख तालाबों या बांधों की तकनीकी विशिष्टताओं के अनुसार होंगे और ये दिशानिर्देश वार्षिक प्रमाणन के लिए एक प्रक्रिया भी निर्धारित करेंगे। परिचालन के साथ-साथ राख तालाब या डाइक को उसकी सुरक्षा, पर्यावरण प्रदूषण, उपलब्ध मात्रा, निपटान के तरीके, पानी की खपत या निपटान में संरक्षण, राख जल पुनर्चक्रण और हरित पट्टी, आदि पर परिचालन के साथ-साथ स्थिर और पुनः प्राप्त किया जाएगा और इस अधिसूचना के प्रकाशन की तारीख से तीन महीने भीतर रखा जाएगा :

परंतु कि 31 दिसंबर, 2021 से पहले चालू किए गए ताप विद्युत संयंत्रों के लिए 1600 मेगावाट से कम या उसके बराबर स्थापित क्षमता वाले दो परिचालन राख तालाबों या डाइकों तक और 1600 से अधिक स्थापित क्षमता वाले ताप विद्युत संयंत्रों के लिए चार परिचालन राख तालाबों या बांधों तक MW, मौजूदा राख तालाबों या बांधों से निर्दिष्ट क्षेत्र के भीतर कई लैगून होने पर, निर्देशांक के साथ स्पष्ट सीमांकन के साथ नामित किया जा सकता है, और केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी)/प्रदूषण को सूचित करेगा। नियंत्रण समिति (पीसीसी) 31 मार्च, 2023 तक :

परंतु आगे कि नए थर्मल पावर प्लांट या मौजूदा थर्मल पावर प्लांट के विस्तार के मामले में केवल एक ऐश पोंड या डाइक की अनुमति दी जाएगी 31 दिसंबर, 2021 को या उसके बाद, जो केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी)/प्रदूषण नियंत्रण समिति (पीसीसी) को कमीशन की तारीख से 3 महीने के भीतर निर्देशांक के साथ सीमांकन के विवरण की सूचना देगा। थर्मल पावर प्लांट या 31 मार्च, 2023 तक, जो भी बाद में हो :

परंतु यह और कि कोयला और लिग्नाइट आधारित तापीय विद्युत संयंत्रों को आगे किसी भी नए कार्यशील राख कुंड या डाइक को स्थापित करने या नाम निर्दिष्ट करने की अनुमति नहीं दी जाएगी।

परंतु यह और कि कार्यशील राख कुंड या डाइक की 0.1 हे./मेगावॉट (एमडब्ल्यू) का विनिर्देशन तारीख 3 नवम्बर, 2009 से पूर्व चालू तापीय विद्युत संयंत्रों पर लागू नहीं होंगे।”

2. पैरा ख में, -

(i) उप पैरा (1) में, “300 कि.मी. के भीतर” शब्दों कोष्ठकों और आंकड़ों के स्थान पर “300 कि.मी. के रेडियस के भीतर” शब्द कोष्ठक और आंकड़े रखे जाएंगे।

(ii) उप पैरा (8) में, उच्चतर “वैकल्पिक उत्पादों के मूल्य से अधिक” शब्दों के स्थान पर “केन्द्रीय लोक कार्य विभाग (सीपीडब्ल्यूडी) या संबंधित लोक कार्य विभाग (पीडब्ल्यूडी) द्वारा विनिर्दिष्ट दरों की अनुसूची में उल्लिखित मूल्य या दरों की अनुसूची के अधीन निर्धारित न होने परल वैकल्पिक उत्पादों का मूल्य” शब्द रखे जाएंगे।

3. पैरा घ में, -

(i) उप पैरा (2) के स्थान, उप पैरा रखा जाएगा, अर्थात्:

“(2) जिन व्यक्तियों या उपयोगकर्ता या एजेंसियों को थर्मल पावर प्लांट के मालिक द्वारा नोटिस दिया गया है, अगर वे राख के उपयोग के उद्देश्य से पहले से ही अन्य एजेंसियों के साथ करार कर चुके हैं तो थर्मल पावर प्लांट को तदनुसार सूचित करेंगे और यदि वे उपयोग नहीं कर सकते हैं कोई राख या कम मात्रा का उपयोग कर सकता है।”

(ii) उप-पैरा (2) के पश्चात्, निम्नलिखित उप-पैरा अंतःस्थापित किया जाएगा, अर्थात्:

“(3) जिन व्यक्तियों या उपभोक्ता अभिकरणों को, यदि वे राख आधारित उत्पादों के उपयोग के उद्देश्य से अन्य अभिकरणों के साथ पहले से जुड़े हुए हैं, ऐश ब्रिक्स या टाइल्स या सिंटेड ऐश ऐग्रीगेट या अन्य राख आधारित उत्पादों के विनिर्माताओं के द्वारा नोटिस दिया गया है तो उन्हें ऐश ब्रिक्स या आइल्स या सिंटेड ऐश ऐग्रीगेट या अन्य राख आधारित उत्पादों के विनिर्माताओं को सूचित करना होगा, तदनुसार, यदि वे राख आधारित उत्पादों का उपयोग नहीं कर सकते या कम प्रमात्रा में उपयोग कर सकते हैं।”

2. यह अधिसूचना राजपत्र में प्रकाशन की तारीख से प्रवृत्त होगी।

[फा. सं. एचएसएम - 9/1/2019- एचएसएम]

नरेश पाल गंगवार, अपर सचिव

टिप्पण: मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग-II, खंड 3, उप-खंड (ii) सं. एस 5481(अ) तारीख 31 दिसम्बर, 2021 के द्वारा में प्रकाशित की गई।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 30th December, 2022

S.O. 6169(E).—Whereas, the Government of India, Ministry of Environment, Forest and Climate Change, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, issued a notification published in the Gazette of India, Extraordinary, Part II, Section 3, sub-section (ii) *vide* S.O.5481(E), dated the 31st December, 2021 (herein after referred to as the ash utilisation notification);

And whereas, requests have been received from Ministry of Power, thermal power plants and various stakeholders regarding implementation of provisions of the ash utilisation notification;

And whereas, it is expedient to make amendments to certain provisions of the said notification to have smooth transitioning in implementation of the ash utilisation notification;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with of sub-rule (1), (2) and (4) of rule (5) of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following amendments in the ash utilisation notification namely:-

In the ash utilisation notification,-

(1) in paragraph A,-

(i) in sub-paragraph (4), after the third proviso, the following shall be inserted, namely,-

“Provided also that new thermal power plants commissioned on or after the date of publication of this notification shall follow the first compliance cycle similar to the compliance cycle specified for thermal power plants having utilisation per cent. less than 60 per cent. as specified in the table.

Note: The utilisation targets as per the applicable compliance cycle shall commence from 1st April, 2022.”.

(ii) in sub- paragraph (5),-

(a) in the opening paragraph, for the words “the date of publication of this notification”, the figures, letters and word “1st April, 2022” shall be substituted;

(b) in the second proviso, -

(i) after the words “green belt or plantation”, the words, brackets, letters and figure “or solar power plant or wind power plant as per the guidelines issued by the Central Pollution Control Board (CPCB) as specified in sub-para (6)” shall be inserted,

(ii) the words, brackets and letters “Central Pollution Control Board (CPCB) or” shall be deleted,

(iii) for the words “a year”, the words “three years” shall be substituted,

(iv) for the words “the date of publication of this notification”, the figures, letters and word “1st April, 2022” shall be substituted.

(c) after the second proviso, the following proviso shall be inserted, namely:

“Provided that ash stored in all ash ponds or dykes other than operational ash pond or dyke designated for temporary storage of ash as specified in sub-para (6) shall constitute the legacy ash and either to be reclaimed or stabilised or utilised.”.

(iii) for sub- paragraph (6), the following sub-para shall be substituted, namely,-

“(6) Any new as well as operational thermal power plant may be permitted operational ash pond or dyke for temporary storage of ash within an area of 0.1 hectare per Mega Watt (MW). Technical specifications of operational as well as stabilised and reclaimed ash ponds or dykes shall be as per the guidelines of the Central Pollution Control Board (CPCB) made in consultation with the Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the operational as well as stabilised and reclaimed ash pond or dyke on its safety, environment pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and green belt, etc. and shall be put in place within three months from the date of publication of this notification:

Provided that up to two operational ash ponds or dykes for thermal power plants commissioned before 31st December, 2021, having installed capacity less than or equal to 1600 MW, and up to four operational ash ponds or dykes for thermal power plants having installed capacity more than 1600 MW, having multiple lagoons, within the specified area from the existing ash ponds or dykes, may be designated with clear demarcation along with coordinates, and shall inform to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 31st March, 2023:

Provided further that one ash pond or dyke shall be permitted in case of new thermal power plants or expansion of existing thermal power plants commissioned on or after 31st December, 2021, which shall inform the details of demarcation along with coordinates to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) within 3 months from the date of commissioning of thermal power plant or by 31st March, 2023, whichever is later:

Provided also that coal and lignite based thermal power plants shall not be allowed to further establish or designate any new operational ash pond or dyke:

Provided also that specification of 0.1 hectare per Mega Watt (MW) of an operational ash pond or dyke shall not be applicable for the thermal power plants commissioned before 03rd November, 2009.”.

(2) in paragraph B,-

(i) in sub- paragraph (1), for the words, figures and letters “within 300 kms”, the words, figures and letters “within a radius of 300 kms” shall be substituted,

(ii) in sub- paragraph (8), for the words “higher than the price of alternative products”, the words, brackets and letters “more than the price mentioned in the Schedule of Rates as specified by Central Public Works Department (CPWD) or concerned Public Works Department (PWD) or price of alternative products, if not mentioned in the Schedule of Rates.” shall be substituted.

(3) in paragraph -D, -

(i) for sub- paragraph (2), the following sub- paragraph shall be substituted, namely,-

“(2) Persons or user agencies who have been served notice by owner of thermal power plants, if they have already tied up with other agencies for the purpose of utilisation of ash, shall inform the thermal power plant accordingly, and if they cannot use any ash or may use reduced quantity.”.

(ii) after sub- paragraph (2), the following sub-para shall be inserted, namely,-

“(3) Persons or user agencies who have been served notice by manufacturers of ash bricks or tiles or sintered ash aggregate or other ash based products, if they have already tied up with other agencies for the purpose of utilisation of ash based products, shall inform the manufacturer of ash bricks or tiles or sintered ash aggregate or other ash based products, accordingly, and if they cannot use ash based products, or may use reduced quantity.”.

2. This notification shall come into force on the date of its publication in the Official Gazette.

[F. No. HSM-9/1/2019-HSM]

NARESH PAL GANGWAR, Addl. Secy.

Note : The principal notification was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii), dated the 31st December, 2021, *vide* number S.O.5481 (E), dated the 31st December, 2021.

Annexures-III**Codes and References**

- 1) IS 1498 - 1970 (Reaffirmed 2007): Classification and Identification of Soils for General Engineering Purposes.
- 2) IS 7894- 1975 (Reaffirmed 2002): Code of Practice for stability Analysis of Earth Dams.
- 3) IS 8237-1895 (Reaffirmed 2002): Code of Practice for Protection of Slopes for Reservoir Embankment.
- 4) IS 8816-1978 (Reaffirmed 2002): Guidelines for design of large Earth and Rock filled Dams.
- 5) IS 9429-1999: Code of Practice for drainage system for Earth and Rock fill Dams.
- 6) IS 12169-1987(Reaffirmed 1997): Criteria for design of small embankment dams
- 7) IS10635-2014(Reaffirmed2020): Freeboard requirements in embankment dams – Guidelines
- 8) Earth and Rock fill Dams by Bharat Singh. H.D Sharma
- 9) USBR: Design of Small Dams
- 10) USBR: Earth Manual
- 11) MoEF&CC- “Gazette notification, SO no.5481(E) 31st Dec.,2021 Part-II, section -3, Sub-section-ii” Ministry of Environment and Forests, Govt.of India, New Delhi.
- 12) MoEF&CC -Ammendment, SO no.6169(E) 30th Dec.,2022 Part-II, section -3, Sub-section-ii” Ministry of Environment and Forests, Govt.of India, New Delhi.
- 13) Naresh D.N., 2008 “Management of ash disposal”, Indian Geotechnical Conference – 2010, GEO trendz December 16–18, 2010 IGS Mumbai Chapter & IIT Bombay.

- 14) ENVIRONMENTAL IMPLICATIONS OF FLY ASH DISPOSAL P. Asokan, Mohani Saxena*, and Shyam R. Asolekar Centre for Environmental Science and Engineering Indian Institute of Technology – Bombay Powai, Mumbai 400 076
- 15) NTPC 2007: Guidelines for ash disposal management in NTPC stations 2005- Corporate Engineering Division, NTPC.
- 16) Guidelines for Management of Ash dyke- Corporate Engineering Division, NTPC Ltd.
- 17) Reclamation potential of ash ponds and future prospects in 2nd International conference on fly ash disposal and utilization. Organized by the Central Board of Irrigation and Power and Fly Ash Mission, Technology, Information Forecasting and Assessment Council, New Delhi, India, 2–4 February 2000.
- 18) Green Belt Requirement for New and Expansion Projects for Obtaining Environmental Clearance in India -V.Vijay Kumar, S.Swathy, R.Radhika, M.A.Fasi Khan and Dr.B.Chakradhar-International Journal of Applied Environmental Sciences ISSN 0973-6077 Volume 14, Number 5 (2019), pp. 475-487 © Research India Publications.
- 19) Geo Environmental Design Practice in Fly Ash Disposal and utilization-Umesh Dayal & Rajiv Sinha



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Annexure-IV 181

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE GOVT. OF INDIA

IPC-II/TPP/CP-11/76/2022/ 406

September 09, 2024

OFFICE MEMORANDUM

Sub: Updated list of authorized auditors to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the users as per Ash Notification No. 5481(E) dated 31.12.2021.

Central Pollution Control Board (CPCB) issued the first list of authorized auditors to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies vide O.M. No. IPC-II/TPP/CP-11/76/2022/1252 dated 06.03.2023 and the updated list vide O.M. No. IPC-II/TPP/CP-11/76/2022/285 dated 17.07.2023, as per Para E(5) of the Ash Notification No. S.O. 5481(E) dated 31.12.2021 issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India (amended by notifications dated 30.12.2022 and 01.01.2024).

Subsequently, it has been observed that more authorized auditors will be required for annual compliance audit of coal or lignite based independent thermal power plants as well as captive power plants to ensure timely auditing and reasonable audit charges.

In view of the above, CPCB invited further nominations of experts as per the revised eligibility criteria from Council of Scientific & Industrial Research (CSIR), Indian Institutes of Technology/Science (IITs), National Institutes of Technology (NITs), other Institutes of National Importance, and other Central and State Government institutions related to Science/Technology/Research and Environment for authorization of more auditors to undertake the compliance audit of the thermal power plant as per Para E(5) of the Ash Notification (and subsequent amendments).

Accordingly, the nominated experts from the aforesaid institutes which are found to be fulfilling the prescribed eligibility criteria as per the attached list are authorized to undertake the annual compliance audit of ash disposal by the coal and lignite based thermal power plants and the users as per Para E(5) of the Ash Notification (and subsequent amendments). The scope of work shall be as per the O.M. dated 06.03.2023 (attached).

The authorization of the auditors shall be valid till their engagement with the institutes.

Thermal power plants shall approach the authorized auditors through the concerned organization/institute for undertaking the compliance audit. The auditor shall submit the compliance audit report directly to the concerned SPCB/PCC and CPCB.

(Bharat Kumar Sharma)
Member Secretary

'परिवेश भवन' पूर्वी अर्जुन नगर, दिल्ली-110032

Parivesh Bhawan, East Arjun Nagar, Delhi-110032

दरभाष/Tel : 43102030. 22305792. वेबसाईट/Website : www.cpcb.nic.in

To,

Divisional Head - IT, CPCB : For updating the document on webpage "Fly Ash Management and Utilization" for information of SPCBs and TPPs.

Copy to:

1. The Additional Secretary (HSM Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
New Delhi - 110 003
2. The Additional Secretary (Thermal),
Ministry of Power,
Shram Shakti Bhawan,
Rafi Marg, New Delhi
3. PA to CCB

Updated list of auditors authorised to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No. 5481(E) dated 31.12.2021

Part A: Authorized auditors to undertake compliance audit of thermal power plants of 'All Capacity'						
Sl. No.	Name	DOB	Designation	Department	Organization/ Institute	Central/ State Institute
1	S. Bhaskar	10-10-1969	Chief Scientist	Advanced Materials Laboratory	CSIR-SERC, Chennai	Central
2	P.S. Ambily	09-05-1979	Principal Scientist	Advanced Materials Laboratory	CSIR-SERC, Chennai	Central
3	T. Hemalatha	24-11-1976	Principal Scientist	Advance Concrete Testing & Evaluation Laboratory	CSIR-SERC, Chennai	Central
4	Manish Mudgal	18-07-1969	Chief Scientist Head	Centre for Advanced Radiation Shielding & Geopolymeric Materials	CSIR-AMPRI, Bhopal	Central
5	Sujit Kumar Mandal	04-11-1964	Chief Scientist	Mine, Planning & Economics Mine Survey & Subsidence Mine Back Filling	CSIR-CIMFR, Dhanbad	Central
6	Jai Krishna Pandey	05-09-1965	Chief Scientist	Mine Fire Ventilation and Miners' Health	CSIR-CIMFR, Dhanbad	Central
7	Santosh Kumar Ray	01-01-1967	Chief Scientist	Mine Fire, Ventilation, Miners' Health	CSIR-CIMFR, Dhanbad	Central
8	Prashant	06-04-1972	Sr. Principal Scientist	Mine Back Filling	CSIR-CIMFR, Dhanbad	Central
9	Arka Jyoti Das	16-10-1989	Sr. Scientist	Geomechanics & Numerical Simulation	CSIR-CIMFR, Dhanbad	Central
10	Santosh Kumar Behera	10-05-1990	Senior Scientist	Mine Back Filling Research Group	CSIR-CIMFR, Dhanbad	Central
11	Anil Kumar Sinha	01-08-1967	Sr. Principal Scientist	Geotechnical Engineering	CSIR-CRRI, New Delhi	Central
12	Manojit Samanta	25-04-1986	Principal Scientist	Geotechnical Engineering	CSIR-CBRI, Roorkee	Central
13	Dinakar Pasla	05-07-1976	Professor	School of Infrastructure	IIT Bhubaneswar	Central
14	Rajesh Roshan Dash	30-06-1977	Professor	School of Infrastructure	IIT Bhubaneswar	Central
15	B. Hanumantha Rao	01-05-1979	Associate Professor	School of Infrastructure	IIT Bhubaneswar	Central
16	Remya Neelancherry	30-05-1982	Associate Professor	School of Infrastructure	IIT Bhubaneswar	Central
17	Prabhat Kumar Singh Dikshit	15-08-1971	Professor & Head	Civil Engineering	IIT-BHU Varanasi	Central
18	Arun Prasad	10-10-1964	Professor	Civil Engineering	IIT-BHU Varanasi	Central
19	Anurag Ohri	07-08-1977	Associate Professor	Civil Engineering	IIT-BHU Varanasi	Central
20	Suresh Kumar	01-11-1976	Assistant Professor	Civil Engineering	IIT-BHU Varanasi	Central
21	Supriya Mohanty	01-01-1988	Assistant Professor	Civil Engineering	IIT-BHU Varanasi	Central
22	Suprakash Gupta	01-01-1969	Professor & Head	Mining Engineering	IIT-BHU Varanasi	Central
23	Sanjay Kumar Sharma	05-01-1966	Professor	Mining Engineering	IIT-BHU Varanasi	Central
24	Rajesh Rai	03-10-1978	Associate Professor	Mining Engineering	IIT-BHU Varanasi	Central
25	Amrendra Kumar	15-05-1976	Associate Professor	Mining Engineering	IIT-BHU Varanasi	Central
26	G.S.P. Singh	23-11-1971	Associate Professor	Mining Engineering	IIT-BHU Varanasi	Central
27	Tarun Verma	05-02-1983	Assistant Professor	Mining Engineering	IIT-BHU Varanasi	Central
28	D. N. Singh	28-06-1965	Professor	Civil Engineering	IIT Bombay	Central
29	Ashish Juneja	15-07-1971	Professor	Civil Engineering	IIT Bombay	Central
30	Munish K. Chandel	27-11-1976	Professor	Environmental Science and Engineering	IIT Bombay	Central
31	Abhishek Chakraborty	15-04-1984	Assistant Professor	Environmental Science and Engineering	IIT Bombay	Central
32	Arya V.	07-12-1988	Assistant Professor	Civil Engineering	IIT Delhi	Central
33	Shailesh R. Gandhi	19-08-1955	Visiting Professor	Civil Engineering	IIT Gandhinagar	Central
34	Amit Balasaheb Shelke	23-07-1984	Associate Professor	Civil Engineering	IIT-Guwahati	Central
35	Sarat Kumar Das	24-06-1968	Professor	Civil Engineering	IIT(ISM) Dhanbad	Central
36	D.P. Mishra	09-06-1975	Chair Professor & Head	Mining Engineering	IIT(ISM) Dhanbad	Central
37	R.K. Sinha	15-12-1973	Associate Professor	Mining Engineering	IIT(ISM) Dhanbad	Central
38	B.S. Choudhary	01-12-1975	Associate Professor	Mining Engineering	IIT(ISM) Dhanbad	Central

Updated list of auditors authorised to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No. 5481(E) dated 31.12.2021

Part A: Authorized auditors to undertake compliance audit of thermal power plants of 'All Capacity'						
Sl. No.	Name	DOB	Designation	Department	Organization/ Institute	Central/ State Institute
39	K. V. Harish	28-11-1981	Assistant Professor	Civil Engineering	IIT-Kanpur	Central
40	Brajesh Kumar Dubey	18-09-1974	Professor	Civil Engineering	IIT Kharagpur	Central
41	Aditya Kumar Patra	11-06-1970	Associate Professor	Mining Engineering	IIT Kharagpur	Central
42	Basanta Kumar Prusty	31-07-1973	Associate Professor	Mining Engineering	IIT Kharagpur	Central
43	Kranthi Kumar Kuna	06-08-1988	Assistant Professor	Civil Engineering	IIT Kharagpur	Central
44	Rajnish Sharma	11-06-1980	Associate Professor	Civil and Environmental Engineering	IIT Mandi	Central
45	Dericks P Shukla	02-01-1982	Associate Professor	Civil and Environmental Engineering	IIT Mandi	Central
46	Deepak Swami	23-06-1984	Associate Professor	Civil and Environmental Engineering	IIT Mandi	Central
47	Subrata Hait	25-10-1980	Associate Professor	Civil and Environmental Engineering	IIT-Patna	Central
48	Vaibhav Singhal	21-01-1983	Associate Professor and Head	Civil and Environmental Engineering	IIT-Patna	Central
49	Amarnath Hegde	07-04-1984	Assistant Professor	Civil and Environmental Engineering	IIT-Patna	Central
50	A. A. Kazmi	27-03-1972	Professor	Civil Engineering	IIT Roorkee	Central
51	Sudipta Sarkar	22-07-1972	Associate Professor	Civil Engineering	IIT Roorkee	Central
52	Bhanu Prakash Vellanki	06-01-1985	Associate Professor	Civil Engineering	IIT Roorkee	Central
53	Naveen James	25-08-1984	Assistant Professor	Civil Engineering	IIT Ropar	Central
54	Suresh Jain	12-07-1975	Professor	Civil and Environmental Engineering	IIT Tirupati	Central
55	Rakesh Chandra Vaishya	10-05-1962	Professor	Civil Engineering	NIT Allahabad	Central
56	Ram Pal Singh	01-03-1962	Professor	Civil Engineering	NIT Allahabad	Central
57	Kumar Venkatesh	07-07-1972	Associate Professor	Civil Engineering	NIT Allahabad	Central
58	Goutam Ghosh	05-07-0977	Associate Professor	Civil Engineering	NIT Allahabad	Central
59	Nekram Rawal	07-09-1977	Associate Professor	Civil Engineering	NIT Allahabad	Central
60	P.R. Pal	26-12-1977	Associate Professor	Civil Engineering	NIT Allahabad	Central
61	Shalinee Shukla	25-04-1978	Associate Professor	Civil Engineering	NIT Allahabad	Central
62	Anupam Rawat	14-11-1986	Associate Professor	Civil Engineering	NIT Allahabad	Central
63	Vijay Kumar	12-02-1982	Assistant Professor	Civil Engineering	NIT Allahabad	Central
64	Vishwajeet Pratap Singh	15-07-1983	Assistant Professor	Civil Engineering	NIT Allahabad	Central
65	S. Chandrakaran	11-02-1959	Professor (HAG)	Civil Engineering	NIT Calicut	Central
66	Santosh G Thampi	18-03-1963	Professor (HAG) & Head	Civil Engineering	NIT Calicut	Central
67	Kodi Ranga Swamy	04-06-1973	Associate Professor	Civil Engineering	NIT Calicut	Central
68	George K. Varghese	17-09-1975	Associate Professor	Civil Engineering	NIT Calicut	Central
69	Sathish Kumar D	30-01-1979	Associate Professor	Civil Engineering	NIT Calicut	Central
70	Ajay Kumar	05-06-1978	HOD and Associate Professor	Civil Engineering	NIT Delhi	Central
71	Kapil Kumar	21-04-1981	Assistant Professor	Civil Engineering	NIT Delhi	Central
72	Mahender Choudhary	04-01-1976	Professor & Head	Civil Engineering	NIT Jaipur	Central
73	Sudhir Kumar	05-02-1968	Professor	Civil Engineering	NIT Jaipur	Central
74	Mahesh Kumar Jat	15-12-1972	Professor	Civil Engineering	NIT Jaipur	Central
75	Sumit Khandelwal	05-08-1976	Professor	Civil Engineering	NIT Jaipur	Central
76	Amit Kumar	15-07-1981	Assistant Professor	Civil Engineering	NIT Jaipur	Central
77	Subhadeep Metya	28-06-1987	Assistant Professor	Civil Engineering	NIT Jamshedpur	Central
78	Susmita Sharma	27-05-1985	Assistant Professor	Civil Engineering	NIT Meghalaya	Central
79	Anirban Mandal	07-01-1976	Professor	Civil Engineering	NIT Nagpur	Central
80	Rahul V. Ralegaonkar	25-09-1976	Professor	Civil Engineering	NIT Nagpur	Central
81	Anjan Patel	14-06-1982	Associate Professor	Civil Engineering	NIT Nagpur	Central
82	A. B. Mirajkar	25-06-1979	Associate Professor	Civil Engineering	NIT Nagpur	Central
83	Mangesh V. Madurwar	20-07-1982	Associate Professor	Civil Engineering	NIT Nagpur	Central
84	Amit Padade	05-10-1985	Assistant Professor	Civil Engineering	NIT Nagpur	Central

Updated list of auditors authorised to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No. 5481(E) dated 31.12.2021

Part A: Authorized auditors to undertake compliance audit of thermal power plants of 'All Capacity'						
Sl. No.	Name	DOB	Designation	Department	Organization/ Institute	Central/ State Institute
85	Karthik Balasundaram	29-02-1984	Assistant Professor	Civil Engineering	NIT Nagpur	Central
86	Swapnil P. Wanjari	25-07-1975	Assistant Professor	Civil Engineering	NIT Nagpur	Central
87	Manoj Pradhan	30.06.1964	Professor	Mining Engineering	NIT Raipur	Central
88	Suresh Prasad Singh	08-05-1964	Professor & Head	Civil Engineering	NIT Rourkela	Central
89	C. R. Patra	25-02-1962	Professor	Civil Engineering	NIT Rourkela	Central
90	Rabi Narayan Behera	03-06-1982	Assistant Professor	Civil Engineering	NIT Rourkela	Central
91	Pradip Sarkar	31-10-1975	Professor	Civil Engineering	NIT Rourkela	Central
92	Mahabir Panda	02-06-1961	Professor	Civil Engineering	NIT Rourkela	Central
93	Amit Kumar Gorai	01-01-1977	Professor & Head	Mining Engineering	NIT Rourkela	Central
94	Manoj Kumar Mishra	29-09-1962	Professor	Mining Engineering	NIT Rourkela	Central
95	Singam Jayanthu	20-04-1964	Professor	Mining Engineering	NIT Rourkela	Central
96	Himanshu Bhusan Sahu	01-07-1974	Professor	Mining Engineering	NIT Rourkela	Central
97	Upendra Kumar	02-02-1972	Professor	Civil Engineering	NIT Silchar	Central
98	Shakeel Ahmad Waseem	27-08-1989	Assistant Professor	Civil Engineering	NIT Srinagar (J&K)	Central
99	R. A. Christian	31-08-1961	Professor & Head	Civil Engineering	NIT Surat	Central
100	M. M. Ahammed	18-01-1967	Professor	Civil Engineering	NIT Surat	Central
101	K. D. Yadav	29-11-1974	Professor	Civil Engineering	NIT Surat	Central
102	Bhaven Tandel	14-04-1974	Associate Professor	Civil Engineering	NIT Surat	Central
103	Namrata Jariwala	05-03-1975	Associate Professor	Civil Engineering	NIT Surat	Central
104	Arun Kumar Thalla	29-07-1978	Professor	Civil Engineering	NIT Surahthal	Central
105	T. Palanisamy	17-05-1977	Associate Professor	Civil Engineering	NIT Surahthal	Central
106	Aruna Mangalpaday	17-05-1971	Professor	Mining Engineering	NIT Surathkal	Central
107	Karra Ram Chandar	05-12-1976	Professor	Mining Engineering	NIT Surathkal	Central
108	Kranti Jain	15-09-1977	Associate Professor	Civil Engineering	NIT Uttarakhand	Central
109	Aditya Kumar Anupam	03-02-1985	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
110	Amardeep	13-08-1985	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
111	Smita Kaloni	02-07-1988	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
112	Shashi Narayan	13-12-1989	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
113	Shashank Bhatra	25-11-1991	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
114	Bibhash Kumar	25-10-1992	Assistant Professor	Civil Engineering	NIT Uttarakhand	Central
115	P. Rathish Kumar	20-01-1969	Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
116	P. Venkateswara Rao	06-05-1978	Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
117	Ajey Kumar Patel	07-11-1977	Associate Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
118	P. Hari Prasad Reddy	19-06-1980	Associate Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
119	Sridhar	20-10-1982	Assistant Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central
120	Chinthala Sumanth	04-08-1986	Assistant Professor	Civil Engineering/ Sustainable Engineering	NIT Warangal	Central

Updated list of auditors authorised to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No. 5481(E) dated 31.12.2021

Part B: Authorized auditors to undertake compliance audit of thermal power plants of 'Total Installed Capacity < 100 MW'						
Sl. No.	Name	DOB	Designation	Department	Organization/ Institute	Central/ State Institute
1	M. Chandra Sekhar	28-11-1963	Director & Professor (HAG)	Civil/Environmental Engineering	Rajiv Gandhi Univ. of Knowledge Tech.	State
2	Manjeet Bansal	29-02-1972	Professor	Civil Engineering	Maharaja Ranjit Singh Punjab Tech. Univ.	State
3	N. Raveendhar	03-08-1959	Consultant (Technical)	EEM&EQM	EPTRI Hyderabad	State
4	Shaik Allavali	18-12-1980	Environmental Engineer	EEM	EPTRI Hyderabad	State

IPC-II/TPP/CP-11/76/2022/

1252

March 06, 2023

OFFICE MEMORANDUM

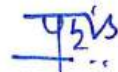
Sub: Authorization of auditors to undertake the compliance audit for ash disposal by the coal and lignite based thermal power plants and the user agencies as per Ash Utilization Notification No.5481(E) dated 31.12.2021.

Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India has issued Notification No. S.O. 5481(E) dated 31.12.2021 regarding ash utilisation from coal or lignite based thermal power plants which has been amended by notification dated 30.12.2022. The permitted areas of ash utilizations are mentioned in Para A (1)&(2), the permitted storage conditions in operational and un-operational ash ponds are mentioned in Para A (6)&(8), and the requirement of submitting annual implementation report to CPCB, concerned SPCB/PCC, CEA and concerned IRO of MoEF&CC by 30th April, with information in the prescribed Annexure, is mentioned in Para E(2) of the Notification.

Further, as per Para E(5) of the notification, "the compliance audit for ash disposal by the thermal power plants and the user agency shall be conducted by auditors, authorized by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report".

CPCB invited nominations of experts from Council of Scientific & Industrial Research (CSIR), Indian Institutes of Technology (IITs) and National Institutes of Technology (NITs) for authorization of auditors to undertake the compliance audit of the thermal power plant as per Para E(5) of the notification. The nominated experts from the aforesaid organizations/institutes which are found to be fulfilling the eligibility criteria as per list attached (Annexure-1) are authorized as auditors to undertake the annual compliance audit of the thermal power plants as per Para E(5) of the notification.

Thermal power plants shall approach authorized auditors through concerned organization/institute for undertaking the audit as per Para E(5) of the notification. Scope of Work to carry out the audit as per Para E(5) of the notification is attached. The auditor shall submit the audit report directly to CPCB and SPCB/PCC.



(Prashant Gargava)
Member Secretary

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
निर्गत
दिनांक 06.03.2023

0/c

To,

Divisional Head - IT, CPCB :

For uploading on webpage "Fly Ash Management and Utilization" for information of SPCBs and TPPs.

Copy to:

1. The Additional Secretary (HSM Division),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan, Jor Bagh Road,
New Delhi - 110 003
2. The Additional Secretary (Thermal),
Ministry of Power,
Shram Shakti Bhawan,
Rafi Marg, New Delhi
3. PA to CCB

Scope of Work to carry out the audit as per Para E(5) of the Ash Notification 31.12.2021

1. Verification of ash generation data pertaining to the financial year based on inspection of records of coal receipt/consumption and average ash content in coal and comparison of this data with the information provided by the power plant in the annual implementation report / prescribed Annexure.
2. Verification of fly ash and bottom ash utilization data pertaining to the financial year based on inspection of records of ash supplied to the user agencies covered under permitted uses/avenues, and comparison of this data with the information provided by the power plant in the annual implementation report / prescribed Annexure
3. Verification of net ash disposal into ash ponds data pertaining to the financial year (i.e. difference of ash generation and ash utilization, as above), and comparison of this data with the information provided by the power plant in the annual implementation report / prescribed Annexure.
4. Assessment of total ash storage in operational and un-operational ash ponds and available storage capacity for further disposal at the end of financial year based on details and drawings of ash ponds provided by the power plant and ground verification of the information provided, and comparison of the storage and available storage capacity with the information provided by the power plant in the annual implementation report / prescribed Annexure.
5. Assessment of ash slurry disposal and ash water re-circulation system used during the financial year, in respect ratio of water in the ash disposed to ash ponds, water used for ash slurry disposal to ash ponds, ash water recycled through AWRS, and ash water discharged into environment, based on inspection of records provided by the power plant and ground verification, including the condition of surrounding environment in respect of ash released or breached, and comparison of the ground situation with the information provided by the power plant in the annual implementation report / prescribed Annexure.



भारत का राजपत्र The Gazette of India

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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

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नई दिल्ली, सोमवार, जनवरी 1, 2024/पौष 11, 1945

No. 05]

NEW DELHI, MONDAY, JANUARY 1, 2024/PAUSHA 11, 1945

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 1 जनवरी, 2024

का.आ. 05(अ).—केन्द्रीय सरकार ने पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उपधारा (1) और उपधारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत के राजपत्र, असाधारण भाग II, खंड 3, उप-खंड (ii) में प्रकाशित संख्या का. आ. 5481(अ), दिनांक 31 दिसंबर, 2021 द्वारा एक अधिसूचना जारी की गई थी;

और, उक्त अधिसूचना के उपबंधों के कार्यान्वयन के संबंध में विद्युत मंत्रालय और अन्य हितधारकों से अनुरोध प्राप्त हुए हैं;

और, पर्यावरण-अनुकूल उद्देश्यों के लिए राख के उपयोग को बढ़ावा देने के लिए उक्त अधिसूचना के कुछ उपबंधों में संशोधन करना समीचीन है, जिसमें राख-आधारित उत्पाद निर्माण में लगे सूक्ष्म और लघु उद्यमों द्वारा निर्मित राख-आधारित उत्पादों में राख का उपयोग सम्मिलित है;

अतः अब, पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (1), उप-नियम (2) और उप-नियम (4) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उपधारा (1) और उपधारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, केन्द्रीय सरकार राख के उपयोग से संबंधित अधिसूचना में निम्नलिखित संशोधन करती है, अर्थात्: -

राख के उपयोग से संबंधित अधिसूचना के,-

(1) पैरा ख में,-

(i) उप-पैरा (1) में, दोनों परंतुकों के स्थान पर, निम्नलिखित परंतुक रखा जाएगा, अर्थात्: -

"परंतु कोयला या लिग्नाइट आधारित थर्मल पावर प्लांट ने ऐसी एजेंसियों को राख उपलब्ध कराने के लिए नोटिस दिया हो, जिसके लिए राख और परिवहन की लागत कोयला या लिग्नाइट आधारित थर्मल पावर प्लांट द्वारा वहन की जाएगी।"

(ii) उप-पैरा (8) में, निम्नलिखित को रखा जाएगा, अर्थात्:

"कोयला या लिग्नाइट आधारित थर्मल पावर प्लांट से 300 किलोमीटर के दायरे में स्थित सभी भवन निर्माण परियोजनाएं (केंद्रीय, राज्य और स्थानीय प्राधिकरण, सरकारी उपक्रम, अन्य सरकारी एजेंसियां और सभी निजी एजेंसियां) राख की ईंटों, टाइल्स, सिंटेड राख समुच्चय या अन्य राख आधारित उत्पाद का उपयोग करेंगी, परन्तु इन्हें केंद्रीय लोक निर्माण विभाग (सीपीडब्ल्यूडी) या संबंधित राज्य के लोक निर्माण विभाग (पीडब्ल्यूडी) द्वारा निर्दिष्ट दरों की अनुसूची में उल्लिखित कीमत से अनधिक कीमत पर उपलब्ध कराया जाएगा या दरों की अनुसूची के आधीन निर्धारित न होने पर वैकल्पिक उत्पादों के मूल्य पर उपलब्ध कराया जाएगा।

परंतु केंद्रीय लोक निर्माण विभाग और संबंधित राज्य के लोक निर्माण विभाग 01 जनवरी, 2024 से छह महीने के भीतर निर्दिष्ट दरों की अनुसूची प्रकाशित करेंगे।"

(iii) उप-पैरा (9) के पश्चात्, निम्नलिखित उप-पैरा अंतःस्थापित किया जाएगा, अर्थात्:

"(10) सभी स्थानीय प्राधिकरण राख और राख-आधारित उत्पादों अर्थात् इमारतों, सड़कों, तटबंधों या किसी अन्य संबंधित निर्माण गतिविधि के निर्माण में ईंटें, ब्लॉक, टाइलें, सिंटेड या कोल्ड बॉन्डेड राख समुच्चय, फाइबर सीमेंट शीट, पाइप, बोर्ड, पैनल के उपयोग के लिए अपने संबंधित भवन उपनियमों और अन्य सुसंगत विनियमों में उपबंध करेंगे।"

(2) पैरा घ में,-

(i) पैरा (1) के स्थान पर, निम्नलिखित को रखा जाएगा, अर्थात्:

"(1) ताप विद्युत संयंत्रों के मालिक उन व्यक्तियों या एजेंसियों को, जिन्हें पैरा ख के उप-पैरा (1) और (3) के अधीन राख का उपयोग करने की आवश्यकता है, परिवहन की लागत को वहन करते हुए राख की मुफ्त आपूर्ति करने के लिए संबंधित राज्य प्रदूषण नियंत्रण बोर्ड को एक प्रति के साथ एक लिखित नोटिस देंगे।

(1क) राख की ईंटों या टाइलों या सिंटेड राख समुच्चय या अन्य राख-आधारित उत्पादों के निर्माता उन व्यक्तियों या एजेंसियों को जिन्हें पेशकश के लिए पैरा ख के उप-पैरा (8) के अधीन राख-आधारित उत्पादों का उपयोग करना आवश्यक है, ऐसे उत्पादों की बिक्री के लिए एक लिखित नोटिस देने सहित संबंधित राज्य प्रदूषण नियंत्रण बोर्ड को उसकी एक प्रति देंगे।"

(ii) उप-पैरा (3) के पश्चात्, निम्नलिखित उप-पैरा अंतःस्थापित किए जाएंगे, अर्थात्:

"(4) कोयला या लिग्नाइट आधारित थर्मल पावर प्लांट इस अधिसूचना के अधीन राख का उपयोग करते समय, राख का एक निश्चित प्रतिशत राख आधारित उत्पादों अर्थात् ईंटों, ब्लॉकों, टाइलों, सिंटेड या कोल्ड बॉन्डेड राख समुच्चय, फाइबर सीमेंट शीट, पाइप, बोर्ड, पैनल के निर्माण में लगे सभी सूक्ष्म और लघु उद्यमों को केंद्र सरकार के विद्युत मंत्रालय द्वारा जारी दिशानिर्देशों के अनुसार रियायती मूल्य पर या सीमित नीलामी के माध्यम से आपूर्ति के लिए आरक्षित रखेंगे।"

[फा. सं. 09/01/2019-एचएसएमडी]

नरेश पाल गंगवार, अपर सचिव

टिप्पण: मूल अधिसूचना भारत के राजपत्र, असाधारण, भाग II, खंड 3, उप-खंड (ii) में संख्या का.आ. 5481 (अ), दिनांक 31 दिसंबर, 2021 द्वारा प्रकाशित की गई थी और संख्या का.आ. 6169 (अ) दिनांक 30 दिसम्बर, 2022 द्वारा अंतिम संशोधन किया गया था।

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MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 1st January, 2024

S.O. 05(E).—Whereas, the Central Government in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, issued a notification published in the Gazette of India, Extraordinary, Part II, Section 3, sub-section (ii) *vide* number S.O.5481(E), dated the 31st December, 2021;

AND WHEREAS, requests have been received from Ministry of Power and other stakeholders regarding implementation of provisions of the said notification;

AND WHEREAS, it is expedient to amend certain provisions of the said notification to promote use of ash for eco-friendly purposes, including use of ash in ash-based products manufactured by micro and small enterprises engaged in ash-based product manufacturing;

NOW, THEREFORE, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with of sub-rule (1), (2) and (4) of rule (5) of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following amendments in the ash utilisation notification, namely:-

In the ash utilisation notification,-

(1) In paragraph B,-

(i) in sub-paragraph (1), for both the provisos, the following proviso shall be substituted, namely: -

“Provided that the coal or lignite based thermal power plant has given a notice to such agencies for making available ash to such agencies for which cost of ash and transportation shall be borne by the coal or lignite based thermal power plant.”

(ii) in sub-paragraph (8), the following shall be substituted, namely:

“All building construction projects (Central, State and Local authorities, Govt. undertakings, other Govt. agencies and all private agencies) located within a radius of 300 kms from a coal or lignite based thermal power plant shall use ash bricks, tiles, sintered ash aggregate or other ash based products, provided these are made available at prices not more than the price mentioned in the Schedule of Rates as specified by the Central Public Works Department (CPWD) or Public Works Department (PWD) of the State concerned or price of alternative products, if not mentioned in the Schedule of Rates.

That the Central Public Works Department and Public Works Department of the State concerned shall publish the Schedule of Rates specified within six months from the 1st January, 2024.”

(iii) after sub-paragraph (9), the following sub-paragraph shall be inserted, namely:

“(10) All local authorities shall make provisions in their respective building bye-laws and other relevant regulations for the use of ash and ash-based products, such as bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre cement sheets, pipes, boards, panels in construction of buildings, roads, embankments or for any other related construction activity.”

(2) In paragraph D,-

(i) for paragraph (1), the following shall be substituted, namely:

“(1) The owner of thermal power plants shall give a written notice to persons or agencies who are required to utilise ash under sub-paragraph (1) & (3) of paragraph B for offering the supply of ash free of cost and bearing cost of transportation, with a copy to concerned State Pollution Control Board.

(1A) The manufacturers of ash bricks or tiles or sintered ash aggregate or other ash-based products shall give a written notice to persons or agencies who are required to utilise ash-based products under sub-paragraph (8) of paragraph B for offering for sale of such products with a copy to concerned State Pollution Control Board.”

(ii) after sub-paragraph (3), the following sub-paragraphs shall be inserted, namely:

“(4) The coal or lignite based thermal power plants, while utilising ash under this notification shall reserve certain percentage of ash for supply to all micro and small enterprises engaged in ash-based product manufacturing namely, bricks, blocks, tiles, sintered or cold bonded ash aggregates, fibre

cement sheets, pipes, boards, panels for sale at concessional price or through limited auction in accordance with the guidelines issued by the Central Government in the Ministry of Power.”

[F. No. 09/01/2019-HSMD]

NARESH PAL GANGWAR, Addl. Secy.

Note : The principal notification was published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii), *vide* number S.O.5481 (E), dated the 31st December, 2021 and last amended, *vide* number S.O. 6169 (E) dated the 30th December, 2022.

F. No. 09/01/2019-HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi – 110003

Dated: 7th December, 2022

OFFICE MEMORANDUM

Sub.: Minutes of the meeting of Fly Ash Management and Utilization Mission held on 24.11.2022- reg.

The undersigned is directed to enclose herewith the minutes of the meeting of “Fly Ash Management and Utilization Mission” held under the Co-Chairpersonship of Secretary (EF&CC) and Secretary (Power) on 24.11.2022 at 15:00 hrs at Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, New Delhi.

2. It is requested, to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority

Encl.: As above

Yours sincerely,


(Dr. Satyendra Kumar)

Director

Ph: 011-20819291

Email: satyendra.kumar07@nic.in

To:

1. Secretary, Ministry of Power, New Delhi
2. Secretary, Ministry of Coal, New Delhi
3. Chief Secretary, State of U.P.
4. Chief Secretary, State of M.P.
5. Chairman, Central Pollution Control Board, New Delhi
6. Additional Chief Secretary /Principal Secretary, Environment Department, Government of Uttar Pradesh
7. Additional Chief Secretary /Principal Secretary, Environment Department, Government of Madhya Pradesh

8. Additional Chief Secretary /Principal Secretary, Department of Power, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Department of Power, Government of Madhya Pradesh
10. Additional Chief Secretary /Principal Secretary, Department of Industries, Government of Uttar Pradesh
11. Additional Chief Secretary /Principal Secretary, Department of Industries, Government of Madhya Pradesh
12. Chairman, UPPCB, Uttar Pradesh
13. Chairman, MPPCB, Madhya Pradesh
14. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
15. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
16. CMD, NCL
17. CMD, M/s NTPC Limited
18. CMD, M/s Anpara Thermal Power Plant (Power Plant)
19. CMD M/s Anpara 'C' Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s Renuagar Thermal Power Plant
22. CMD, M/s UPRVUNL
23. CMD, M/s Grasim Industries Limited, Renukoot, Sonbhadra
24. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
25. CMD, M/s M.P. Power Generating Co. Ltd., Madhya Pradesh

Copy to:

1. Secretary (EF&CC)
2. PPS to AS (NPG)
3. Guard File

**Minutes of the meeting of Fly Ash Management and Utilization Mission
held on 24.11.2022 at 15:00 hrs**

A virtual meeting on 'Ash Management and Utilization Mission', in respect to Hon'ble NGT's Order dated 18.01.2022 in the matter related to the issues of industrial pollution in Singrauli and Sonbhadra region of M.P. and U.P. respectively, was convened on 24th November, 2022 at 15:00 hrs. The list of participants is annexed at **Annexure I**.

During the meeting, following deliberations took place:

1. It was informed that the issues of pollution caused by TPPs and other industries, stone crushers, transportation and coal mining located in Singrauli district of M.P. and Sonbhadra district of U.P. have been raised under various cases to Hon'ble NGT on several instances.
2. It was shared that a team of MoEF&CC officials, Chairman, CPCB and representatives of NTPC visited Singrauli region of M.P.
3. Thereafter, MoEF&CC in its brief presentation (**Annexure II**), summarised the pollution related issues in both the regions, compliance directions given by the Hon'ble NGT and term of references of the Mission. It also reflected the present status of implementation of given directions based on the available compliance report from various stakeholders. The salient points of the presentation are as under:
 - a. The Hon'ble NGT order vide dated 18.01.2022 has emphasized 18 stakeholders from of both the regions to implement the recommendations of Joint Committee and prepare the action plan and implement it in a time bound manner.
 - b. In compliance with one of the direction of Hon'ble NGT in respect to formulation of general road map regarding utilization and management of ash generated by thermal power plants in these two regions as well as across the country, MoEF&CC has already issued a notification on ash utilization that mandates 100% utilization of ash and various other provisions that may lead to effective management of ash in scientific manner.

- c. The action points that emanates from the ash utilization notification dated 31.12.2021 are being taken into consideration and would be by expedited by concerned enforcement agency/ departments.
4. It was shared that the formulation of guidelines for technical specifications of ash ponds or dykes and procedure for annual certification of the ash pond or dyke has been initiated by Central Pollution Control Board as mandated under Para A (6) of ash utilization notification dated 31.12.2021.
5. CMD, NCL informed that for the purpose of mixing at least 25 per cent of ash on weight to weight basis of the materials used for external dump of overburden, backfilling or stowing of mine, low stripping ratio mines may be put on trial as there is possibility of mixing of ash with overburden in mine voids.

After deliberations, following decisions were made:

1. Secretariat to be established in CPCB for coordination, monitoring and supervision of the actions emanating from the deliberations and decisions of the Fly Ash Supervision and Utilization Mission. **(Action: CPCB)**
2. For effective prevention, control and abatement of industrial pollution in Singrauli and Sonbhadra districts, the actions plans prepared based on the recommendations of the Joint Committee, mentioned out in Para 15 of the Hon'ble NGT's Order dated 18.01.2022, to be scrupulously implemented in a time-bound manner as per the action plans at **Annexure III (Action: CPCB, State Govts of UP and MP, M/s NTPC Limited (Singrauli) Shakti Nagar Sonbhadra, M/s NTPC Rihand Super Thermal Power, M/s NTPC Limited Vindhyachal Super Thermal Power Plant, M/s Anpara Thermal Power Plant, M/s Obra Thermal Power Station, M/s NCL Bina Project, Bina, Sonbhadra, M/s NCL Dudhichuwa Project, Sonbhadra, M/s NCL Kakri Project, Sonbhadra, M/s NCL Khadia Project, Sonbhadra, M/s NCL Krishna Shila Project, M/s Renusagar Thermal Power Plant, Aluminum Smelter: M/s HINDALCO Industries Ltd, Renukoot, M/s Grasim Industries Limited Chemical Division, Renukoot, M/s M.P. Power Generating Co. Ltd. (MPPGCL), M/s Birla Carbon India Pvt. Ltd., Sonbhadra)**

3. CPCB and CEA to scrutinize the action plans submitted by the respective stakeholders as per Point No. 2 above to ensure that the action points have been prepared as per the recommendations of the Joint Committee as mentioned out in Para 15 of the Hon'ble NGT's Order dated 18.01.2022. CPCB to ensure that all the activities are covered and must have specific timelines **(Action: CPCB, CEA)**
4. In order to ensure 100% utilization of ash by lignite and coal based thermal power plants, effective monitoring and supervision of provisions of Ash Utilization Notification dated 31.12.2021 **(Annexure IV)** have to be scrupulously complied with. Respective stakeholders have been mapped in respect of the various activities mandated under the notification. CPCB to coordinate with all the regulatory/enforcing agencies and ensure the compliance of all the activities in a time bound and on a regular basis **(Action: CPCB, CEA, All State Govts, All stakeholders as per Annexure IV)**
5. Concerned District Magistrates of Singrauli and Sonbhadra to submit action plans immediately for effective prevention, control and abatement of pollution from stone crushers located at their respective districts. Further, the action plans submitted must be scrupulously implemented in a time bound manner. **(Action: State Govts of U.P. and M.P., District Magistrates – Sonbhara and Singrauli)**
6. M/s Anpara 'C' Lanco to submit action plans based on the recommendations in para 15 of the Hon'ble NGT's Order dated 18.01.2022 immediately. **(Action: M/s Anpara 'C' Lanco, State Govt of UP)**
7. Secretariat at CPCB to upload the action plans and the progress of the action plans on the web portal of CPCB by 5th of next month, the link of which may be placed on MoEFCC as well as the concerned State Government's and other stakeholders' websites. CPCB to put in place an IT based tool for updating the progress in regard to the implementation of action plans by respective stakeholders as well as in regard to the activities as per Point 4 above. **(Action: CPCB, State Govts of UP and MP, All stakeholders)**
8. Concerned State Governments, the State Environment Departments and concerned SPCBs to take all measures for the prevention, control and

abatement of the industrial pollution in Sonbhadra and Singrauli districts to bring down the pollution levels in these districts. The compliance of the conditions of CTOs as well as ECs in respect of all the industries, including the installation and functioning of all pollution control as well as monitoring devices, must be strictly complied with by all industrial/mining/ quarrying units. These compliances to be reported to CPCB on a monthly basis through a web portal that reflects the obligations and compliances as per CTO as well as EC in respect of all units **(Action: State Governments of U.P. and M.P.)**

9. All the industrial, coal and other mining activities as well as the stone quarrying and crushing in the districts of Sonbhadra and Singrauli must be carried out in compliance with the Air Act, Water Act and EP Act. Regular inspections and audits to be carried out by the concerned SPCBs **(Action: State Governments of U.P. and M.P.)**
10. The respective State Government to receive voluntary fund contributions out of the CSR funds from companies in respective districts. Concerned State Government to create a separate account to receive voluntary contributions and funds for environment restoration and relief. Concerned State Government to take measures for restoration of environment and provide relief to victims of damage in a manner as may be found appropriate from these funds. **(Action: State Governments of U.P. and M.P.)**
11. Concerned State Governments to arrange for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries. **(Action: State Governments of U.P. and M.P.)**

Annexure I

List of Participants

- 1) Ms. Leena Nandan, Secretary, EFCC
- 2) Shri. Alok Kumar, Secretary, Power
- 3) Shri Anandji Prasad, Advisor, MoC
- 4) Shri. Naresh Pal Gangwar, Additional Secretary, MoEFCC
- 5) Dr. Satyendra Kumar, Director, MoEFCC
- 6) Shri N. Subrahmanyam, Scientist D, MoEFCC
- 7) Shri. Nazimuddin, Scientist F, CPCB
- 8) Shri MVR Reddy, ED, SSEA, NTPC
- 9) Managing Director, UPRVUNL
- 10) Shri Ajay Kumar Sharma, MS, UPPCB
- 11) Dr. Hemant Kumar Sharma, MPPCB, Jabalpur
- 12) Shri S C Naik, DGM Operations, NTPC
- 13) Shri Bhola Singh, CMD, NCL - SINGRAULI
- 14) Shri R N Shukla, Adani
- 15) Shri Basuraj Goswami, Executive Director, NTPC
- 16) Shri Sitiesh Barche, NTPC
- 17) Shri R D Patil, CPCB Lucknow
- 18) Shri A K Chattopadhyay, NTPC
- 19) Shri M. Devaraj, Chairman, UPPCL
- 20) Shri Ravindra Raghuvanshi, Birla Carbon
- 21) Dr. Bhola Kushwaha, Head, Environment, HPPL
- 22) Shri V R Shankar, M/s Hindalco
- 23) Shri Vivek Gupta, Aditya Birla
- 24) Shri V R Shankar, Aditya Birla
- 25) Shri. Harish Duhan, GM (Nigahi), NCL
- 26) M/s Sasan Ultra Mega Power Plant
- 27) Shri BG Setty, Addl. GM, NTPC
- 28) General Manager, Jhingurda Project, NCL
- 29) Chief General Manager, M/s Obra Thermal Power Station
- 30) Shri Utpal Sarkar, Aditya Birla
- 31) Regional Officer, Sonbhadra, UPPCB
- 32) Shri M Devaraj, Chairman, UPPCL
- 33) Regional Officer, Bhopal, MoEFCC
- 34) Regional Officer, Singrauli, MPPCB
- 35) Nodal Officer, Environment, Amhohri Project, NCL
- 36) Additional Chief Secretary, UP
- 37) Shri Dinesh Kumar Meena, NTPC
- 38) Shri V Santosh, NTPC
- 39) Shri Munish Jain, NTPC
- 40) Shri S C Naik, NTPC
- 41) Shri Sanjay Singh, Grasim Corporate
- 42) Shri Ramesh Babu, NTPC
- 43) Shri Anshul Chilbule, MPPCB Bhopal

- 44) Dushichua Project, NCL
- 45) Shri Alan Antony, Deputy Manager, Environment, Bina Project, NCL
- 46) Regional Director, CPCB, Bhopal
- 47) Shri R B Sindhur, SOM, Nigahi
- 48) Shri Gurdeep Singh, NTPC
- 49) ATP, Anpara
- 50) Shri Ravindra Nath Singh, Director (Thermal)
- 51) Shri Jitendra Yadav
- 52) Shri Rajiv Kumar, General Manager, NCL Khadia
- 53) Shri Manohar Kumar, Rosa Power
- 54) Shri Sunil Kumar Meena, Sc-D, CPCB
- 55) Additional Chief Secretary, Energy, UP

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Presentation
on
Industrial Pollution in Singrauli and Sonbhadra Districts
&
Effective Utilisation and Management of Fly Ash



HSM Division

Government of India

Ministry of Environment, Forest & Climate Change

24th November, 2022

Singrauli District:

- i. TPPs- 5 (NTPC Vindhyachal, Sasan UMPP, Jaypee Nigrie, Adani Power (MP) Ltd., and Hindalco Industries Ltd.)**
- ii. Coal Mines- 8 (NCL - Jhingurda, Khadia, Block-B, Jayant, Amlohri, Nigahi, Dudhichua, and Bina)**
- iii. Stone Crushers**

Sonbhadra District:

- i. TPPs– 9 (NTPC Singrauli, NTPC Rihand, UPRVUNL Anpara A, B & D TPS, Lanco Anpara C TPS, UPRVUNL Obra TPS, Hindalco Industries Ltd. (Renukoot CPP), Hindalco Industries Ltd. (Renusagar CPP), UltraTech Cement Ltd. (Dalla Cement CPP),Grasim Industries Ltd. (CPP)**
- ii. Coal Mines – 5 (NCL - Kakri, Krishnashila, Bina Extn., Dudhichua, Khadia)**
- iii. Aluminium Smelter (Hindalco)**
- iv. Stone Crushers**

- **Major issues of industrial pollution-**
 - **Industrial pollution and ash management related issues**
 - **Installation of pollution control as well as monitoring devices**
 - **Discharge of wastewater and ash in Rihand reservoir/water bodies**
 - **Pollution by stone crushers, coal mining and transportation.**
- **Joint Committee constituted -2018, report submitted-2019.**
- **Committee gave recommendations in respect of all industries**
- **Oversight Committee formed to review implementation**
- **Further, committees comprising of respective DMs constituted for compliance**
- **Hon'ble NGT vide Order dated 18.01.2022 directed to constitute Fly Ash Management and Utilization Mission.**
- **MoEF&CC vide OM dated 09.03.2022 constituted Fly Ash Management and Utilization Mission**

- **NGT directed the Mission to :-**

- **Coordinate and monitor of ash utilization matters as well as all associated industrial pollution issues in Singrauli and Sonbhadra region**
- **To take stock of the situation and to prepare action plan in the light of recommendations of Joint Committee in respect of Singrauli and Sonbhadra**
- **To prepare general road map and monitoring of scientific ash utilisation and management including legacy ash**
- **May review the progress on a monthly basis and may place the quarterly progress on website**
- **May require voluntary financial contributions out of CSR funds from companies**
- **May get separate account for restoration of environment and relief to victims of damage in a manner as may be found necessary**
- **May consider the safeguards in ash utilisation notification dated 21.12.2021**
- **May interact with stakeholders, including brick manufacturers for fly ash utilisation**
- **May conduct public health and risk impact assessment in areas of operation of TPPs and other generators of ash**
- **May consider use of beneficiated coal**
- **May consider onsite and offsite crisis management plans with regard to ash ponds and dykes**

Action plans have been **submitted by 15 stakeholders:**

- **M/s NTPC Limited (Singrauli) Shakti Nagar Sonbhadra,**
- **M/s NTPC Rihand Super Thermal Power,**
- **M/s NTPC Limited Vindhyachal Super Thermal Power Plant,**
- **M/s Anpara Thermal Power Plant**
- **M/s Obra Thermal Power Station**
- **M/s NCL Bina Project, Bina, Sonbhadra,**
- **M/s NCL Dudhichuwa Project, Sonbhadra,**
- **M/s NCL Kakri Project, Sonbhadra,**
- **M/s NCL Khadia Project, Sonbhadra,**
- **M/s NCL Krishna Shila Project,**
- **M/s Renusagar Thermal Power Plant, Aluminum Smelter:**
- **M/s HINDALCO Industries Ltd, Renukoot,**
- **M/s Grasim Industries Limited Chemical Division, Renukoot,**
- **M/s M.P. Power Generating Co. Ltd. (MPPGCL),**
- **M/s Birla Carbon India Pvt. Ltd., Sonbhadra.**

Action plans from namely, **M/s Anpara 'C' Lanco Thermal Power Station, and**

Action plans w.r.t. Stone Crushers yet to be submitted by concerned DMs.

SI No.	Action	Recommendation
1	Coordinate and monitor ash utilization matters as well as all associated industrial pollution issues in Singrauli and Sonbhadra region	<ul style="list-style-type: none">• MPPCB in respect of Singrauli, UPPCB in respect of Sonbhadra to enforce the action plans of industries as well as relating to stone crushers (submitted by DMs)• CPCB to coordinate overall enforcement of all related matters

SI No.	Action	Recommendation
2	To take stock of the situation and to prepare action plan in the light of recommendations of Joint Committee in respect of Singrauli and Sonbhadra	i. Action plans from the industries specified at Para 15 of NGT w.r.t Joint Committee recommendations received from 15 industries (TPPs, mines, Aluminium Smelters). Action plans yet to be received from:- • M/s Anpara C Lanco Thermal Power Station; • Stone crushers in Singrauli and Sonbhadra region. ii. UP State Pollution Control Board (with respect to M/s Anpara C Lanco Thermal Power Station) and concerned District Magistrates (with respect to stone crushers) have been requested to obtain action plans.

SINo	Action	Recommendation
3	<p>(a) To prepare general road map and monitoring of scientific ash utilisation and management including legacy ash</p> <p>(b) May consider the safeguards in ash utilisation notification dated 21.12.2021</p> <p>(c) May interact with stakeholders, including brick manufacturers for fly ash utilisation</p>	<p>i. Ash Utilisation notification mandates 100% utilisation of ash</p> <p>ii. Different stakeholders/regulators have been given specific mandate as well as timelines</p> <p>iii. Detailed status is presented later slides</p> <p>iv. Technical specifications of ash ponds shall be as per the guidelines of CPCB made in consultation with CEA</p> <p>v. Guidelines shall lay down a procedure for annual certification of ash pond/dyke on its safety, environmental pollution, mode of disposal, water consumption/conservation in disposal, ash waster recycling and greenbelt, etc.</p> <p>vi. CPCB to prepare guidelines immediately.</p> <p>vii. Implementation Committee has been constituted under Ash Utilisation notification with concerned stakeholders. Fly ash brick manufacturers may be interacted.</p>

Sl No.	Action	Recommendation
4	May review the progress on a monthly basis and may place the quarterly progress on website	CPCB, State Governments of UP and MP, MPPCB and UPPCB to upload the monthly status on website by getting the progress of action plans submitted by industries

SI No.	Action	Recommendation
5	<p>(a) May require voluntary financial contributions out of CSR funds from companies</p> <p>(b) May get separate account for restoration of environment and relief to victims of damage in a manner as may be found necessary</p> <p>(d) May conduct public health and risk impact assessment in areas of operation of TPPs and other generators of ash</p>	<p>i. Respective State Governments may be requested to receive voluntary financial contributions from CSR funds of the companies</p> <p>ii. Concerned State Government may get a separate account created to receive voluntary contributions and funds for environment restoration and relief.</p> <p>iii. Concerned State Governments to arrange for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries</p>

SI No.	Action	Recommendation
6	May consider use of beneficiated coal	MoEFCC vide notification dated 21.5.2020 removed the mandatory use of beneficiated coal for power plants and mandated to meet the emission norms and 100% ash utilisation as per prescribed timelines.

SI No.	Action	Recommendation
6	May consider onsite and offsite crisis management plans with regard to ash ponds and dykes	i. Concerned DMs to ensure onsite and offsite crisis management plans are in place for ash dykes in respective Districts.

Provisions of Ash Utilisation Notification and responsibilities of stakeholders ²¹⁴

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SI No.	Action	Status	Timeline	Enforcement Agency/Dept.
1	Constitution of Committee for to examine and review and recommend the eco-friendly ways of utilisation of ash, Para A(3)	Completed	-	CPCB
2	100% Utilisation of current ash by TPPs as per timelines, Para A(4)	Ongoing	As prescribed	SPCB/PCC
3	Guidelines for procedure for annual certification of the ash pond or dyke on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and greenbelt etc., Para A(6)	Ongoing	Immediate	CPCB and CEA
4	Loading, unloading, transport, storage and disposal of ash to be done in an environmentally sound manner by TPPs and all precautions to prevent air and water pollution to be taken, Para A(7)	Ongoing	Immediate	CPCB and SPCB/PCC
5	Installation of dedicated silos by TPPs for storage of dry fly ash for at least sixteen hours of ash, Para A(8)	Ongoing	Immediate	CPCB and SPCB/PCC
6	TPPs to provide real time data daily regarding the availability of ash by providing the link to CPCB's web portal or mobile phone app, Para A(9)	To be started	Immediate	CPCB and SPC/PCC

SI No.	Action	Status 501	Timeline	Enforcement Agency/Dept.
7	Mandatory utilisation of ash by government, semi-government and private agencies for construction activities within 300 kms of the TPPs, <i>Para B(1)</i>	Ongoing	Immediate	CPCB and SPCB/PCC
8	Backfilling of ash in mine voids or mixing of ash with external overburden dumps under EPR by mines located within 300 km radius of TPPs, <i>Para B(3)</i>	Ongoing	Immediate	CPCB, SPCB/PCC, DGMS, IBM
9	Constitution of Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, <i>Para B(5)</i>	Completed	-	CPCB
10	Committee to get the updated quarterly reports for identified mines, <i>Para B(5)</i>	Ongoing	Immediate	CPCB
11	Filling of low lying areas with ash for approved projects in accordance to the guidelines by CPCB, <i>Para B(6)</i>	Ongoing	Immediate	CPCB and SPCB/PCC
12	SPCB to publish the approved low lying sites, location, area and permitted quantity annually on its website, <i>Para B(6)</i>	Ongoing	Annual	SPCB/PCC

SI No.	Action 502	Status	Timeline	Enforcement Agency/Dept. 216
13	CPCB to put the guidelines in place for all types of activities envisaged under the notification, <i>Para B(7)</i>	Ongoing	Within one year of publication of notification	CPCB
14	Usage of ash bricks, tiles, sintered ash aggregate or other ash based products by all building construction projects located within a radius of 300 km from the TPP , provided these are made available at prices not higher than the price of alternative products, <i>Para B(8)</i>	Ongoing	Immediate	CPCB and SPCB/PCC
15	Issuance of notice to agencies for mandatory utilization of ash & ash-based products, <i>Para D(1)</i>	Ongoing	On-need basis	Owners of TPPs, manufacturers of ash based products
16	Enforcement and monitoring of utilization of ash by TPPs, <i>Para E(1)</i>	Ongoing	Quarterly	CPCB, SPCB/PCC and District Magistrate
17	Development of web portal by CPCB for provisions under the notification, <i>Para E(1)</i>	Ongoing	Immediate	CPCB
18	TPPs to upload monthly information regarding ash generation and utilization, <i>Para E(2)(i)</i>	Ongoing	By 5th of next month	CPCB
19	TPPs to upload annual implementation report providing information about compliance of provisions in the notification, <i>Para E(2)(i)</i>	Yet to start	By 30th of April	SPCB/PCC
20	Compilation of annual reports submitted by TPPs by CPCB and CEA, <i>Para E(2)(i)</i>	Yet to start	By 31st of May	CPCB, CEA

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SI No.	Action	Status	Timeline	Enforcement Agency/Dept.
21	Constitution of a Committee for monitoring the implementation of the provisions of the notification, Para E(3)	Completed	-	CPCB
22	Meeting of the Committee to review annual implementation reports, Para E(3)	Ongoing	Once in six months	CPCB
23	Committee to hold stakeholder consultation for monitoring of ash utilization , Para E(3)	Ongoing	Once in six months	CPCB
24	Committee to submit six monthly report to MoEFCC, Para E(3)	Ongoing	Once in six months	CPCB
25	Constitution of State Level Committee to resolve disputes between TPPs and users of ash or manufacture of ash based products, Para E(4)	Ongoing	Immediate	CPCB
26	Compliance audit for ash disposal by TPPs and user agencies by auditors authorised by CPCB, Para E(5)	Ongoing	Annual	CPCB, SPCB/PCC
27	Audit report to be submitted to CPCB and concerned SPCB, Para E(5)	Yet to start	By 30th November every year	CPCB and SPCB/PCC
28	Initiation of action against non-compliant TPPs, Para E(5)	Yet to start	Within fifteen days of receipt of audit report	CPCB, SPCB/PCC

Action Plan based on the recommendation of Joint Committee

SI No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
1.	M/s NTPC Limited (Singrauli) Shakti Nagar Sonbhadra	Take measures to stop the discharge of ash pond overflow into the Rihand reservoir	Discharge of ash pond overflow has been stopped	. Augmentation of AWRS capacity by installing another pump (2000 m3/hr. capacity).	-	July, 23	MPPCB
		Relocation of the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter	OCEMS is working in NTPC Singrauli	OCEMS at Chimney will be installed along with FGD installation	-	Dec, 26(As per FGD Timeline)	MPPCB
		Installation of third CAAQMS	Installed	-	-	-	MPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Connected	-	-	-	MPPCB
		Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan submitted	-	-	MPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Work of absorber and associated work is in progress. All three Chimneys construction have been completed. Efforts are being made to complete FGD installation.	-	Commissioning by Dec'26(As per FGD Timeline)	MPPCB
		Treatment of the MSW generated from their residential colony	-	Bio-methanation plant has been commissioned. Composting pits with covered shed are being constructed. Non-biodegradable waste (plastic waste) is being sent to registered recycler.	-	October, 23	MPPCB
		Undertake immediate measures to control fugitive emission in ash dyke area	-	Measures for regular water sprinkling have been taken and fugitive emission is under control in the dyke area.	-	-	MPPCB

SI No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
2.	M/s NTPC Rihand Super Thermal Power Plant (Power)	Connection of CAAQMS to the CPCB/SPCB server	Connected to CPCB/UPPCB server	-	-	-	CPCB/UPPCB
		Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan Submitted	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Civil and mechanical works for installation of FGD are in progress in full swing	-	Dec'26(As per FGD Timeline)	CPCB/UPPCB
3.	M/s NTPC Limited Vindhyachal Super Thermal Power Plant	Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan submitted	-	-	CPCB/UPPCB
		Explore possibilities for the construction of Ash mounds and submission of progress from time to time	NA	NA	NA	NA	CPCB/UPPCB

SI No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
4.	M/s Renusagar Thermal Power Plant	Installation of sludge drying beds in the existing ETP	Installation of 02 No. Filter Press (of modern technology sludge drying beds) has been completed (Commissioning started)	Commissioning of the filter expected to be completed by end of November 2022	-	Nov, 2022	CPCB/UPPC B
		Relocation of the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter	For isokinetic sampling, installed new analyzers for Boiler#6 to #10	Connectivity with CPCB server to be provided	-	Connectivity by January, 2023	CPCB/UPPCB
		Submission of time bound action plan to relocate the existing CAAQMS	Relocated the existing 01 No. CAAQMS at lower altitude near Civil Office in March 2022. Data is linked with CPCB/SPCB server.	-	-	-	CPCB/UPPC B
		Completion of installation of another 02 CAAQMS	Installed	-	-	-	CPCB/UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Connected	-	-	-	CPCB/UPPC B
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan submitted	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Installation is expected to be completed by December 2023	-	Dec-23	CPCB/UPPC B
		Adoption of scientific approach for disposal of MSW	-	Non-biodegradable waste is being sent to vendors and Biodegradable waste is being converted to compost for in-house utilization	-	-	CPCB/UPPCB
		Undertake corrective measures to control the fugitive emissions from raw material storage and fly ash transportation areas	-	Waste sprinkling arrangements and rain guns are installed. Additional water sprinkling system installed	-	-	CPCB/UPPC B
		Submission of explanation for dumping the fly ash in haphazard manner	Ash disposed in haphazard manner has been reclaimed and area has been further cleaned	-	-	-	CPCB/UPPCB
Undertake immediate action for proper disposal of fly ash	-	-		-	CPCB/UPPCB		

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SI No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
5.	M/s Northern Coalfields Limited (NCL) Bina Bina, Sonbhadra)	Submission of time bound action plan for controlling the fire in the coal stock yard	-	Action Plan submitted	-	-	CPCB/UPPC B
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities	-	A log book is being kept in CCTV Control Room and record fugitive emissions visible in CCTV cameras and corrective action taken on the report.	-	-	CPCB/UPPC B
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	-	Compliance of fully tarapualin covered trucks is being ensured	-	-	CPCB/UPPC B
		Effective tyre washing facility for transport vehicles		Tendering process for tyre washing facility has been completed and LOA has been issued		Mar-23	CPCB/UPPC B
		Treatment and disposal of MSW generated in the residential colony	-	Proper treatment and disposal of MSW generated in residential colony is ensured.	-	-	CPCB/UPPC B
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	-	-	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study	Dec, 23	CPCB/UPPC B
		Take corrective measures so that the site of CAAQMS is open from all directions	-	This being complied. Trees within the close vicinity of CAAQMS have been trimmed to minimize hindrance at the site.	-	-	UPPCB

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SI No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
6.	M/s Northern Coalfields Limited (NCL) (NCL Dudhichuwa Project, Sonbhadra)	Regular operations of ETP	-	Continuous operation of ETP is ensured	-	-	CPCB/UPP CB
		Utilization of the treated effluent to achieve zero discharge	-	Treated Effluent from ETP is used in Water sprinkling, Fire fighting and wahsing of HEMM and zero discharge is maintained.	-	-	CPCB/UPP CB
		Ensure that no treated/untreated effluent will be discharged into the Balia Nalla which finally meets the Rihand reservoir	-	Water from various sources is pumped to ETP. Treated Effluent from ETP is being used in water sprinkling, fire fighting and wahsing of HEMM.	-	-	CPCB/UPP CB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities	-	CCTV network is utilized for monitoring of fugitive emissions. In case of appearance of fugitive emissions on CCTV, immediate action is taken.	-	-	CPCB/UPP CB
		Strengthen the vigilance mechanism to identify the default transporters and take stringent action against them	-	Only tarapauline covered trucks are allowed . CCTV has been installed at the exit check post. Security Guards at the check post has been posted at exit point to ensure the strict compliance.	-	-	CPCB/UPP CB
		Effective tire washing facility for transport vehicles	-	Proposal of tyre washing facility at Dudhichua Project is in final stage of completion.	-	May, 2023	CPCB/UPP CB
		Treatment and disposal of MSW generated in the residential colony	-	Wet waste is converted to compost and Dry waste is handled by Singrauli Municipal Corporation.	-	-	CPCB/UPP CB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in an operational mine related to mine backfilling through fly ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec, 2023	CPCB/UPP CB

SI No.	Stakeholder	Actions	509 Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be Started		
7.	M/s Northern Coalfields Limited (NCL) (NCL Kakri Project, Sonbhadra)	Ensure that no treated or untreated effluent will be discharged into the Rihand reservoir through the drain	-	Compliance is being ensured. Nos fixed fog cannon is also in process of being hired.	-	May-23	CPCB/UPPCB
		Entrapment of seepage in the drain at mine water collection sump	Complied	-	-	-	CPCB/UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	Complied				CPCB/UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	-	-	-Monitoring of fugitive emissions inside the mines is being done through CMPDIL each fortnightly, and report is being communicated to UPPCB quarterly. CCTV have been installed only at strategic positions in mines. Monitoring of fugitive emissions throughout the mines through CCTV is not possible.	-	CPCB/UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May, 2023	UPPCB
		Treatment and disposal of MSW generated in the residential colony	-	The work has been commenced.	-	-	UPPCB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.		Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.		Dec, 2023	CPCB/UPPCB
		Open the site of CAAQMS from all the direction	Complied	-	-	-	-

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/D ept.
			Completed	Ongoing	Yet to be Started		
8.	M/s Northern Coalfields Limited (NCL) Khadia Project, Sonbhadra	Continuous operations of the ETP	Yes	Compliance being ensured	-	-	-
		Ensure that no treated/untreated effluent will be discharged in to the environment	Complied	-	-	-	CPCB/UPPCB
		Regular operation of the water spraying system for effective control of fugitive dust emissions	-	Complied. Installation of 3 nos. of additional fixed fog cannon in progress	-	May'2023	CPCB/UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	CCTV cameras installed. Truck without tarpaulin covering not allowed. One register has also been put at the Exit Gates for documenting any such violation and to take action against the security personnel manning the exit gates as well as against the defaulter trucks, if any.	-	-	-	CPCB/UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May'2023	CPCB/UPPCB
		Proper treatment and disposal of MSW generated in the residential colony	-	In progress	-	April'2023	CPCB/UPPCB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec'2023	CPCB/UPPCB
		Ensure that the site of CAAQMS is open from all the direction	Complied	-	-	-	CPCB/UPPCB

SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/D ept.
			Completed	Ongoing	Yet to be Started		
8.	M/s Northern Coalfields Limited (NCL) Khadia Project, Sonbhadra	Continuous operations of the ETP	Yes	Compliance being ensured	-	-	-
		Ensure that no treated/untreated effluent will be discharged in to the environment	Complied	-	-	-	CPCB/UPPCB
		Regular operation of the water spraying system for effective control of fugitive dust emissions	-	Complied. Installation of 3 nos. of additional fixed fog cannon in progress	-	May'2023	CPCB/UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	CCTV cameras installed. Truck without tarpaulin covering not allowed. One register has also been put at the Exit Gates for documenting any such violation and to take action against the security personnel manning the exit gates as well as against the defaulter trucks, if any.	-	-	-	CPCB/UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May'2023	CPCB/UPPCB
		Proper treatment and disposal of MSW generated in the residential colony	-	In progress	-	April'2023	CPCB/UPPCB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec'2023	CPCB/UPPCB
		Ensure that the site of CAAQMS is open from all the direction	Complied	-	-	-	CPCB/UPPCB

SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
9.	M/s Northern Coalfields Limited (NCL) (NCL Krishna Shila Project)	Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	62 CCTVs installed at different points in the mine. Monitoring of fugitive emissions is being done regularly from field and GM office.	-	-	-	CPCB/UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	The Transportation agencies have been instructed. Strict action are being taken against the uncovered trucks if found.	-	-	-	CPCB/UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress. Tyre washing facility to be jointly developed for Bina and Krishnashila projects.	-	31.03.2023	CPCB/UPPCB
		Proper treatment and disposal of MSW generated in their residential colony	-	The proposal for proper treatment and disposal of MSW generated in the residential colony is under tendering process.	-	30.06.2023	CPCB/UPPCB
		Submission of the time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	-	-	For utilization of fly ash, NCL had provided one pit of abandoned/closed Gorbi Mine to NTPC-Vindhyachal (VSTPP). MoU between NCL and NTPC-VSTPS has been done on 3rd Jan, 2019. Approx. 30 to 40 Million tons of fly ash will be accommodated in to this mine void. Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.	Dec-23	CPCB/UPPCB

SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.	
			Completed	Ongoing	Yet to be started			
10.	Aluminum Smelter: M/s HINDALCO Industries Renukoot, Sonbhadra Ltd,	Take corrective measures to achieve the ZLD	ZLD status achieved. Process Water Recycling Plant (PWRP) has been installed.	-	-	-	UPPCB	
		Ensure environment friendly disposal for the huge quantity of bottom ash stored in open inside the plant premises	ZLD status achieved. Process Water Recycling Plant (PWRP) has been installed.	-	-	-	CPCB/UPPCB	
		Proper treatment and disposal of the MSW	-	Collected non-biodegradable waste is segregated for further disposal through re-processors/recyclers. Biodegradable waste is converted into vermicompost for inhouse utilization in our horticultural activities. Procurement of equipment's for segregation of collected waste category wise is in progress. Installation of new machines requisite civil and electrical job is in progress	-	-	-	CPCB/UPPCB
		Undertake corrective measures to control the fugitive emission effectively	Dust Extraction & Dust Suppression System is installed at coal discharge point and conveyors. Rain guns in yard periphery used for controlling dust in coal storage area. Stacker mouths discharge are mounted with water sprinklers in all the crushers in coal handling plant area.	-	-	-	CPCB/UPPCB	

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SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			514 Completed	Ongoing	Yet to be started		
11.	M/s Grasim Industries Limited Chemical Division, Renukoot, Sonbhadra	Submission of the clarification regarding the discharge of chemically contaminated effluent into the drain	Action plan not required. Unit is ZLD. Already installed ETP, RO, MEE and STP and achieved Zero Liquid Discharge since 2017. Intimation to the Board about installation and commissioning of ZLD is done vide our letter No. GIL/ENV/17-18/204 dated 17.11.2017.	-	-	NA	CPCB/ UPPCB
		Ensure environment friendly disposal of all the brine sludge stored in open pit	Fully complied. At present no legacy brine sludge is stored inside the plant premises.	-	-	-	CPCB/ UPPCB
		Completion of the remediation activities in the time bound manner of the area wherein the ash has been dumped	Complied. Process of reclamation has already been successfully completed.	-	-	-	CPCB/ UPPCB
		Preparation and execution of an action plan to shift the mercury bearing brine sludge and the muck contaminated with chlorinated chemicals from the factory premises to the TSDF in consultation with the UPPCB	<ul style="list-style-type: none"> •Matter sub-judiced before Hon'ble Apex Court. •On the basis of the Report of NEERI, Hon'ble Supreme Court has pleased to grant a stay against the NGT proceeding vide order dated 04.11.2019. In the interest of justice, it would be advisable to keep this issue in abeyance, till issue is disposed of by the Hon'ble Apex Court. Intimation through e-mail dated 14.11.2022 along with and Hard Copy, has been sent to MoEFCC.	-	-	-	CPCB/ UPPCB

SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
12.	M.P. Power Generating Co. Ltd. (MPPGCL)	To check the strength of the bunds created around the dykes/low lying areas quarterly and one time especially before the on-set of the monsoon through expert agencies of repute and to submit Action Taken Reports to regional offices of MPPCB, CPCB & MoEF&CC periodically.	Ash dykes are proper & scientifically designed and present status is good for technical soundness, structural strength, stability, safety and is structurally sustainable and safe for adequacy for handling of fly ash generated from TPSs. Advised to monitor the performance of the dyke using geotechnical instrumentation. Report submitted to MPPCB vide no. 2235 dated: 10/12/2019. To comply with NGT order dated: 18/01/2022.	-	-	-	CPCB/ MPPCB
		To obtain prior permission from MPPCB before any disposal of fly ash / bottom ash in the low lying areas and ensure disposal as per the CPCB guideline.	The condition is regularly prescribed by MPPCB during the renewal of Consent to Operate (CTO) every year and same is being complied by the thermal power stations of MPPGCL as and when required. Action plan for fly ash utilization has been submitted	-	---	Timeline for ash utilization 31.03.2023	CPCB/ MPPCB
13.	M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra	Strict vigilance on the area from where the effluent was earlier reaching outside the plant boundary	-	The company has installed ETP & STP for treating effluent and sewage and achieved Zero liquid discharge since 2011.	-	-	CPCB/ UPPCB

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Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ 230t.
			Completed	Ongoing	Yet to be started		
14.	M/s Obra Thermal Power Station (Power Plant)	Undertake action to trap the continuous flow of ash slurry from powerhouse and ash pond overflow water carrying ash into the river Renu	Ash dyke has been raised and there is no overflow of water carrying ash into river Renu. AWRS has been made functional for recycling of ash water.	-	-	-	CPCB/UPPCB
		Restoration of the river bed areas on which a huge deposition of ash is visible in time-bound manner	-	Restoration of river bed area is under progress and 7800 Cum ash has been removed. Remaining quantity shall be done by June-2023.	-	Jun-23	
		Treatment of the industrial effluent, untreated effluent not to be discharged into the river Renu	-	ETP & STP are operational. No effluent is being discharged into river Renu.	-	-	CPCB/UPPCB
		Installation of an effluent collection and conveyance system for ETP & STP	A dedicated sump and sump pump house for all effluent collection has been completed and functional since April-2022.	-	-	-	CPCB/UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Already connected. Data is available on CPCB/SPCB server.	-	-	-	
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan submitted.	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	-	-	-	CPCB/UPPCB
		Adoption of scientific approach for treatment and disposal of MSW	-	Door to Door collection of waste is being done and segregated as Dry and Wet waste. Tender for treatment and disposal of MSW will be floated by 5.12.2022.	-	April, 23	CPCB/UPPCB
		Installation of flow meters for measuring amount of ash slurry discharged and water recycled through AWRS	-	Flow meter supplied and installation shall be done by 20.12.2022.	-	Dec., 22	CPCB/UPPCB
		Installation of flow meters for measuring the amount of wastewater treated through the ETP and STP	-	Flow meter supplied and installation shall be done by 20.12.2022.	-	Dec., 22	CPCB/UPPCB
Fixing the personal responsibility of the officers seating at management level for causing environmental damage.	Responsibility of three officers of Chief Engineer level been fixed and disciplinary proceedings have been initiated.	-	-		CPCB/UPPCB		

SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.	
			Completed	Ongoing	Yet to be started			
15.	M/s Anpara Thermal Power Plant (Power Plant)	Installation of flow meters to measure the amount of ash slurry discharged into the ash pond and the amount of water recovered and recycled	-	Flow meter has been installed in Units B & D and their commissioning will be completed by 15.12.2022. Commissioning in Unit A shall be completed by January-2023.	-	Jan-23	UPPCB	
		Entrapment of wastewater discharge containing ash into the Rihand reservoir through the drain at power house area	-	Installation of ETP for Anpara A & B is in progress and is likely to be completed by July-2023. Entrapment of waste water discharge is included in the scope of ETP contract.	-	Jul-23	UPPCB/CPC B	
		Submission of explanation for not achieving ZLD in ETP & STP		Anpara A & B are more than 25 years old and there was no provision of ETP & STP. STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.	-	-	UPPCB/CPCB	
		Submission of a time-bound action plan for achieving ZLD	-	STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.		Jul-23	UPPCB/CPC B	
		Removal of deposited fly ash on the surface of the Rihand reservoir in time-bound manner	33000 Cum of fly ash deposited on the surface of the reservoir has been removed.	-		-	-	UPPCB/CPCB
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan has been submitted.		-	-	UPPCB/CPC B
		Provision to prevent the surface runoff water from the surrounding area reaching the ash dyke	Raising of the ash dyke done. There is no surface runoff water coming inside the ash dyke (except rain water of Morcha Nala).	-		-	-	
		Installation and commissioning of the FGD system in realization of the revised timeline	-		-	Installation of FGD in Unit D under progress and is likely to be completed by Dec 2023. Retendering was done and the latest bid was rejected as it was 106% higher than the estimate. Next bid will be floated by 30.11.2022.	Dec, 2023	UPPCB

Thanks

Action Plans based on the recommendations of the Joint Committee

SI No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
1.	M/s NTPC Limited (Singrauli) Shakti Nagar Sonbhadra	Take measures to stop the discharge of ash pond overflow into the Rihand reservoir	Discharge of ash pond overflow has been stopped.	Augmentation of AWRS capacity by installing another pump (2000 m ³ /hr. capacity).	-	July, 23	MPPCB
		Relocation of the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter	OCEMS is working in NTPC Singrauli.	OCEMS at Chimney will be installed along with FGD installation.	-	Dec, 26(As per FGD Timeline)	MPPCB
		Installation of third CAAQMS	Installed	-	-	-	MPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Connected	-	-	-	MPPCB
		Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan submitted	-	-	MPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Work of absorber and associated work is in progress. All three Chimneys construction have been completed. Efforts are being made to complete FGD installation.	-	Commissioning by Dec'26(As per FGD Timeline)	MPPCB
		Treatment of the MSW generated from their residential colony	-	Bio-methanation plant has been commissioned. Composting pits with covered shed are being constructed. Non-biodegradable waste (plastic waste) is being sent to registered recycler.	-	October, 23	MPPCB
		Undertake immediate measures to control fugitive emission in ash dyke area	-	Measures for regular water sprinkling have been taken and fugitive emission is under control in the dyke area.	-	-	MPPCB

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Sl No.	Stakeholders	Actions	Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
2.	M/s NTPC Rihand Super Thermal Power (Power Plant)	Connection of CAAQMS to the CPCB/SPCB server	Connected to CPCB/UPPCB server	-	-	-	CPCB/UPPCB
		Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan Submitted	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Civil and mechanical works for installation of FGD are in progress in full swing	-	Dec'26(As per FGD Timeline)	CPCB/UPPCB
3.	M/s NTPC Limited Vindhyachal Super Thermal Power Plant	Submission of a time-bound action plan for 100% fly ash utilization	-	Action Plan submitted	-	-	CPCB/UPPCB
		Explore possibilities for the construction of Ash mounds and submission of progress from time to time	NA	NA	NA	NA	CPCB/UPPCB

Sl No.	Stakeholders	Actions	521 Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
4.	M/s Renusagar Thermal Power Plant	Installation of sludge drying beds in the existing ETP	Installation of 02 No. Filter Press (of modern technology sludge drying beds) has been completed (Commissioning started)	Commissioning of the filter expected to be completed by end of November 2022	-	Nov, 2022	CPCB/UPPCB
		Relocation of the OCEMS in order to achieve the desired iso-kinetic sampling for particulate matter	For isokinetic sampling, installed new analyzers for Boiler#6 to #10	Connectivity with CPCB server to be provided	-	Connectivity by January, 2023	CPCB/UPPCB
		Submission of time bound action plan to relocate the existing CAAQMS	Relocated the existing 01 No. CAAQMS at lower altitude near Civil Office in March 2022. Data is linked with CPCB/SPCB server.	-	-	-	CPCB/UPPCB
		Completion of installation of another 02 CAAQMS	Installed	-	-	-	CPCB/UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Connected	-	-	-	CPCB/UPPCB
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan submitted	-	-	CPCB/UPPCB
		Installation and commissioning of the FGD system in realization of the revised timeline	-	Installation is expected to be completed by December 2023	-	Dec-23	CPCB/UPPCB
		Adoption of scientific approach for disposal of MSW	-	Non-biodegradable waste is being sent to vendors and Biodegradable waste is being converted to compost for in-house utilization	-	-	CPCB/UPPCB

		Undertake corrective measures to control the fugitive emissions from raw material storage and fly ash transportation areas	-	522	Waste sprinkling arrangements and rain guns are installed. Additional water sprinkling system installed	-	-	CPCB/UPPCB
		Submission of explanation for dumping the fly ash in haphazard manner	Ash disposed in haphazard manner has been reclaimed and area has been further cleaned			-	-	CPCB/UPPCB
		Undertake immediate action for proper disposal of fly ash						

SI No.	Stakeholders	Actions	523 Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
5.	M/s Northern Coalfields Limited (NCL) (NCL Bina Project, Bina, Sonbhadra)	Submission of time bound action plan for controlling the fire in the coal stock yard	-	Action Plan submitted	-	-	CPCB/UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities	-	A log book is being kept in CCTV Control Room and record fugitive emissions visible in CCTV cameras and corrective action taken on the report.	-	-	CPCB/UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	-	Compliance of fully tarapualin covered trucks is being ensured	-	-	CPCB/UPPCB
		Effective tyre washing facility for transport vehicles		Tendering process for tyre washing facility has been completed and LOA has been issued		Mar-23	CPCB/UPPCB
		Treatment and disposal of MSW generated in the residential colony	-	Proper treatment and disposal of MSW generated in residential colony is ensured.	-	-	CPCB/UPPCB

		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	-	524	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study	Dec, 23	CPCB/UPPCB
		Take corrective measures so that the site of CAAQMS is open from all directions	-	This being complied. Trees within the close vicinity of CAAQMS have been trimmed to minimize hindrance at the site.	-	-	UPPCB

SI No.	Stakeholders	Actions	525 Status			Timelines for Completion	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
6.	M/s Northern Coalfields Limited (NCL) (NCL Dudhichuwa Project, Sonbhadra)	Regular operations of ETP	-	Continuous operation of ETP is ensured	-	-	CPCB/UPPCB
		Utilization of the treated effluent to achieve zero discharge	-	Treated Effluent from ETP is used in Water sprinkling, Fire fighting and wahsing of HEMM and zero discharge is maintained.	-	-	CPCB/UPPCB
		Ensure that no treated/untreated effluent will be discharged into the Balia Nalla which finally meets the Rihand reservoir	-	Water from various sources is pumped to ETP. Treated Effluent from ETP is being used in water sprinkling, fire fighting and wahsing of HEMM.	-	-	CPCB/UPPCB
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities	-	CCTV network is utilized for monitoring of fugitive emissions. In case of appearance of fugitive emissions on CCTV, immediate action is taken.	-	-	CPCB/UPPCB
		Strengthen the vigilance mechanism to identify the default transporters and take stringent action against them	-	Only tarapauline covered trucks are allowed. CCTV has been installed at the exit check post. Security Guards at the check post has been posted at exit point to ensure the strict compliance.	-	-	CPCB/UPPCB
		Effective tire washing facility for transport vehicles	-	Proposal of tyre washing facility at Dudhichua Project is in final stage of completion.	-	May, 2023	CPCB/UPPCB
		Treatment and disposal of MSW generated in the residential colony	-	Wet waste is converted to compost and Dry waste is handled by Singrauli Municipal Corporation.	-	-	CPCB/UPPCB
		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in an operational mine related to mine backfilling through fly ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec, 2023	CPCB/UPPCB

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SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.	
			Completed	Ongoing	Yet to be Started			
7.	M/s Northern Coalfields Limited (NCL) (NCL Kakri Project, Sonbhadra)	Ensure that no treated or untreated effluent will be discharged into the Rihand reservoir through the drain	-	Compliance is being ensured. Nos fixed fog cannon is also in process of being hired.	-	May-23	CPCB/UPPCB	
		Entrapment of seepage in the drain at mine water collection sump	Complied	-	-	-	CPCB/UPPCB	
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	Complied				CPCB/UPPCB	
		Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	-	-	-Monitoring of fugitive emissions inside the mines is being done through CMPDIL each fortnightly, and report is being communicated to UPPCB quarterly. CCTV have been installed only at strategic positions in mines. Monitoring of fugitive emissions throughout the mines through CCTV is not possible.	-		CPCB/UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May, 2023	UPPCB	
		Treatment and disposal of MSW generated in the residential colony	-	The work has been commenced.	-	-	UPPCB	

		Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.		Field study at MCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.		Dec, 2023	CPCB/ UPPCB
		Open the site of CAAQMS from all the direction	Complied	-	-	-	-

SI No.	Stakeholder	Actions	528 Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be Started		
8.	M/s Northern Coalfields Limited (NCL) (NCL Khadia Project, Sonbhadra)	Continuous operations of the ETP	Yes	Compliance being ensured	-	-	-
		Ensure that no treated/untreated effluent will be discharged in to the environment	Complied	-	-	-	CPCB/UPPCB
		Regular operation of the water spraying system for effective control of fugitive dust emissions	-	Complied. Installation of 3 nos. of additional fixed fog cannon in progress	-	May'2023	CPCB/UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	CCTV cameras installed. Truck without tarpaulin covering not allowed. One register has also been put at the Exit Gates for documenting any such violation and to take action against the security personnel manning the exit gates as well as against the defaulter trucks, if any.	-	-	-	CPCB/UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress	-	May'2023	CPCB/UPPCB
		Proper treatment and disposal of MSW generated in the residential colony	-	In progress	-	April'2023	CPCB/UPPCB

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	Submission of time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine	-	Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Action plan will be submitted on the basis of recommendations of above mentioned study.	-	Dec'2023	CPCB/ UPPCB
	Ensure that the site of CAAQMS is open from all the direction	Complied	-	-	-	CPCB/ UPPCB

SI No.	Stakeholder	Actions	530 Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
9.	M/s Northern Coalfields Limited (NCL) (NCL Krishna Shila Project)	Explore the possibility to monitor the status of fugitive emissions through the existing CCTV network provided for monitoring of production activities.	62 CCTVs installed at different points in the mine. Monitoring of fugitive emissions is being done regularly from field and GM office.	-	-	-	CPCB/UPPCB
		Strengthening of the vigilance mechanism to identify the default transporters and take stringent action against them	The Transportation agencies have been instructed. Strict action are being taken against the uncovered trucks if found.	-	-	-	CPCB/UPPCB
		Effective tyre washing facility for transport vehicles	-	In progress. Tyre washing facility to be jointly developed for Bina and Krishnashila projects.	-	31.03.2023	CPCB/UPPCB
		Proper treatment and disposal of MSW generated in their residential colony	-	The proposal for proper treatment and disposal of MSW generated in the residential colony is under tendering process.	-	30.06.2023	CPCB/UPPCB

		Submission of the time-bound action plan for compliance with the provision of the Notification of 2009 regarding utilization of 25% fly ash along with Over Burden (OB) for back-filling the abandoned mine.	-	531	For utilization of fly ash, NCL had provided one pit of abandoned/closed Gorbi Mine to NTPC-Vindhyachal (VSTPP). MoU between NCL and NTPC-VSTPS has been done on 3rd Jan, 2019. Approx. 30 to 40 Million tons of fly ash will be accommodated in to this mine void. Field study at NCL in one mine related to mine Backfilling through Fly Ash and its stability analysis is under approval stage. Tentative schedule of completion is by December 2023. Action plan will be submitted on the basis of recommendations of above mentioned study.	Dec-23	CPCB/ UPPCB
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SI No.	Stakeholder	Actions	532 Status			Timeline	Enforcement Agency/Dept.	
			Completed	Ongoing	Yet to be started			
10.	Aluminum Smelter: M/s HINDALCO Industries Ltd, Renukoot, Sonbhadra	Take corrective measures to achieve the ZLD	ZLD status achieved. Process Water Recycling Plant (PWRP) has been installed.	-	-	-	UPPCB	
		Ensure environment friendly disposal for the huge quantity of bottom ash stored in open inside the plant premises	ZLD status achieved. Process Water Recycling Plant (PWRP) has been installed.	-	-	-	CPCB/ UPPCB	
		Proper treatment and disposal of the MSW	-	Collected non-biodegradable waste is segregated for further disposal through re-processors/recyclers. Biodegradable waste is converted into vermicompost for inhouse utilization in our horticultural activities. Procurement of equipment's for segregation of collected waste category wise is in progress. Installation of new machines requisite civil and electrical job is in progress	-	-	-	CPCB/ UPPCB
		Undertake corrective measures to control the fugitive emission effectively	Dust Extraction & Dust Suppression System is installed at coal discharge point and conveyors. Rain guns in yard periphery used for controlling dust in coal storage area. Stacker mouths discharge are mounted with water sprinklers in all the crushers in coal handling plant area.	-	-	-	-	CPCB/ UPPCB

SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/Dept.
			Completed	Ongoing	Yet to be started		
11.	M/s Grasim Industries Limited Chemical Division, Renukoot, Sonbhadra	Submission of the clarification regarding the discharge of chemically contaminated effluent into the drain	Action plan not required. Unit is ZLD. Already installed ETP, RO, MEE and STP and achieved Zero Liquid Discharge since 2017. Intimation to the Board about installation and commissioning of ZLD is done vide our letter No. GIL/ENV/17-18/204 dated 17.11.2017.	-	-	NA	CPCB/ UPPCB
		Ensure environment friendly disposal of all the brine sludge stored in open pit	Fully complied. At present no legacy brine sludge is stored inside the plant premises.	-	-	-	CPCB/ UPPCB
		Completion of the remediation activities in the time bound manner of the area wherein the ash has been dumped	Complied. Process of reclamation has already been successfully completed.	-	-	-	CPCB/ UPPCB
		Preparation and execution of an action plan to shift the mercury bearing brine sludge and the muck contaminated with chlorinated chemicals from the factory premises to the TSDF in consultation with the UPPCB	<ul style="list-style-type: none"> Matter sub-judiced before Hon'ble Apex Court. On the basis of the Report of NEERI, Hon'ble Supreme Court has pleased to grant a stay against the NGT proceeding vide order dated 04.11.2019. <p>In the interest of justice, it would be advisable to keep this issue in abeyance, till issue is disposed of by the Hon'ble Apex Court. Intimation through e-mail dated 14.11.2022 along with and Hard Copy, has been sent to MoEFCC.</p>	-	-	-	CPCB/ UPPCB

Sl No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
12.	M.P. Power Generating Co. Ltd. (MPPGCL)	To check the strength of the bunds created around the dykes/low lying areas quarterly and one time especially before the on-set of the monsoon through expert agencies of repute and to submit Action Taken Reports to regional offices of MPPCB, CPCB & MoEF&CC periodically.	Ash dykes are proper & scientifically designed and present status is good for technical soundness, structural strength, stability, safety and is structurally sustainable and safe for adequacy for handling of fly ash generated from TPSs. Advised to monitor the performance of the dyke using geotechnical instrumentation. Report submitted to MPPCB vide no. 2235 dated: 10/12/2019. To comply with NGT order dated: 18/01/2022.	-	-	-	CPCB/ MPPCB
		To obtain prior permission from MPPCB before any disposal of fly ash / bottom ash in the low lying areas and ensure disposal as per the CPCB guideline.	The condition is regularly prescribed by MPPCB during the renewal of Consent to Operate (CTO) every year and same is being complied by the thermal power stations of MPPGCL as and when required. Action plan for fly ash utilization has been submitted	-	---	Timeline for ash utilization 31.03.2023	CPCB/ MPPCB
13.	M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra	Strict vigilance on the area from where the effluent was earlier reaching outside the plant boundary	-	The company has installed ETP & STP for treating effluent and sewage and achieved Zero liquid discharge since 2011.	-	-	CPCB/ UPPCB

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SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
14.	M/s Obra Thermal Power Station (Power Plant)	Undertake action to trap the continuous flow of ash slurry from powerhouse and ash pond overflow water carrying ash into the river Renu	Ash dyke has been raised and there is no overflow of water carrying ash into river Renu. AWRS has been made functional for recycling of ash water.	-	-	-	CPCB/UPPCB
		Restoration of the river bed areas on which a huge deposition of ash is visible in time-bound manner	-	Restoration of river bed area is under progress and 7800 Cum ash has been removed. Remaining quantity shall be done by June-2023.	-	Jun-23	CPCB/UPPCB
		Treatment of the industrial effluent, untreated effluent not to be discharged into the river Renu	-	ETP & STP are operational. No effluent is being discharged into river Renu.	-	-	CPCB/UPPCB
		Installation of an effluent collection and conveyance system for ETP & STP	A dedicated sump and sump pump house for all effluent collection has been completed and functional since April-2022.	-	-	-	CPCB/UPPCB
		Connection of CAAQMS to the CPCB/SPCB server	Already connected. Data is available on CPCB/SPCB server.	-	-	-	CPCB/UPPCB
		Submission of time-bound action plan for 100% fly ash utilization	-	Action plan submitted.	-	-	CPCB/UPPCB

		Installation and commissioning of the FGD system in realization of the revised timeline	-	536	Due to space constraint for installation of wet FGD system, Dry Sorbent Injection FGD was approved. Further tendering is under progress.	-		CPCB/UPPCB
		Adoption of scientific approach for treatment and disposal of MSW	-		Door to Door collection of waste is being done and segregated as Dry and Wet waste. Tender for treatment and disposal of MSW will be floated by 5.12.2022.	-	April, 23	CPCB/UPPCB
		Installation of flow meters for measuring amount of ash slurry discharged and water recycled through AWRS	-		Flow meter supplied and installation shall be done by 20.12.2022.	-	Dec., 22	CPCB/UPPCB
		Installation of flow meters for measuring the amount of wastewater treated through the ETP and STP	-		Flow meter supplied and installation shall be done by 20.12.2022.	-	Dec., 22	CPCB/UPPCB
		Fixing the personal responsibility of the officers seating at management level for causing environmental damage.	Responsibility of three officers of Chief Engineer level been fixed and disciplinary proceedings have been initiated.	-	-	-		CPCB/UPPCB

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SI No.	Stakeholder	Actions	Status			Timeline	Enforcement Agency/ Dept.
			Completed	Ongoing	Yet to be started		
15.	M/s Anpara Thermal Power Plant (Power Plant)	Installation of flow meters to measure the amount of ash slurry discharged into the ash pond and the amount of water recovered and recycled	-	Flow meter has been installed in Units B & D and their commissioning will be completed by 15.12.2022. Commissioning in Unit A shall be completed by January-2023.	-	Jan-23	UPPCB
		Entrapment of wastewater discharge containing ash into the Rihand reservoir through the drain at power house area	-	Installation of ETP for Anpara A & B is in progress and is likely to be completed by July-2023. Entrapment of waste water discharge is included in the scope of ETP contract.	-	Jul-23	UPPCB/CPCB
		Submission of explanation for not achieving ZLD in ETP & STP	-	Anpara A & B are more than 25 years old and there was no provision of ETP & STP. STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.	-	-	UPPCB/CPCB
		Submission of a time-bound action plan for achieving ZLD	-	STP has been installed. Installation of ETP for Units A & B is in progress and will be completed by July-2023.	-	Jul-23	UPPCB/CPCB
		Removal of deposited fly ash on the surface of the Rihand reservoir in time-bound manner	33000 Cum of fly ash deposited on the surface of the reservoir has been removed.	-	-	-	UPPCB/CPCB

		Submission of time-bound action plan for 100% fly ash utilization	-	Action Plan 538 has been submitted.	-	-	UPPCB/CPCB
		Provision to prevent the surface runoff water from the surrounding area reaching the ash dyke	Raising of the ash dyke done. There is no surface runoff water coming inside the ash dyke (except rain water of Morcha Nala).	-	-	-	
		Installation and commissioning of the FGD system in realization of the revised timeline	-	-	Installation of FGD in Unit D under progress and is likely to be completed by Dec 2023. Retendering was done and the latest bid was rejected as it was 106% higher than the estimate. Next bid will be floated by 30.11.2022.	Dec, 2023	UPPCB

Annexure IV

SI No.	Action	Status	Timeline	Enforcement Agency/Dept.
1	Constitution of Committee for to examine and review and recommend the eco-friendly ways of utilisation of ash, <i>Para A(3)</i>	Completed	-	CPCB
2	100% Utilisation of current ash by thermal power plants as per timelines, <i>Para A(4)</i>	Ongoing	As prescribed	SPCB/PCC
3	Guidelines for procedure for annual certification of the ash pond or dyke on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and greenbelt etc., <i>Para A(6)</i>	Ongoing	Immediate	CPCB and CEA
4	Loading, unloading, transport, storage and disposal of ash to be done in an environmentally sound manner by thermal power plants and all precautions to prevent air and water pollution to be taken and status to be reported to concerned SPCB/PCC, <i>Para A(7)</i>	Ongoing	Immediate	CPCB and SPCB/PCC
5	Installation of dedicated silos by TPPs for storage of dry fly ash for at least sixteen hours of ash based on installed capacity and report to concerned SPCB/PCC, inspection to be done by CPCB/SPCB/PCC from time to time, <i>Para A(8)</i>	Ongoing	Immediate	CPCB and SPCB/PCC
6	Thermal power plants to provide real time data daily regarding the availability of ash by providing the link to CPCB's web portal or mobile phone app, <i>Para A(9)</i>	To be started	Immediate	CPCB and SPC/PCC
7	Mandatory utilisation of ash by government, semi-government and private agencies for construction activities within 300 kms of the thermal power plants, <i>Para B(1)</i>	Ongoing	Immediate	CPCB and SPCB/PCC

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8	Backfilling of ash in mine voids or mixing of ash with external overburden dumps under EPR by mines located within 300 km radius of thermal power plants, <i>Para B(3)</i>	Ongoing	Immediate	CPCB, SPCB/PCC, DGMS, IBM
9	Constitution of Committee for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump, <i>Para B(5)</i>	Completed	-	CPCB
10	Committee to get the updated quarterly reports for identified mines, <i>Para B(5)</i>	Ongoing	Immediate	CPCB
11	Filling of low lying areas with ash for approved projects with prior permission of SPCB in accordance to the guidelines by CPCB, <i>Para B(6)</i>	Ongoing	Immediate	CPCB and SPCB/PCC
12	SPCB/PCC to publish the approved low lying sites, location, area and permitted quantity annually on its website, <i>Para B(6)</i>	Ongoing	Annual	SPCB/PCC
13	CPCB to put the guidelines in place for all types of activities envisaged under the notification <i>Para B(7)</i>	Ongoing	Within one year of publication of notification	CPCB
14	Usage of ash bricks, tiles, sintered ash aggregate or other ash based products by all building construction projects located within a radius of 300 km from the thermal power plant , provided these are made available at prices not higher than the price of alternative products, <i>Para B(8)</i>	Ongoing	Immediate	CPCB and SPCB/PCC
15	Issuance of notice to agencies for mandatory utilization of ash & ash-based products, <i>Para D(1)</i>	Ongoing	On-need basis	Owners of TPPs, manufacturers of ash based products
16	Enforcement and monitoring of utilization of ash by TPPs, <i>Para E(1)</i>	Ongoing	Quarterly	CPCB, SPCB/PCC and District Magistrate
17	Development of web portal by CPCB for provisions under the notification, <i>Para E(1)</i>	Ongoing	Immediate	CPCB

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18	Thermal power plants to upload monthly information regarding ash generation and utilisation, <i>Para E(2)(i)</i>	Ongoing	By 5th of next month	CPCB
19	Thermal power plants to upload annual implementation report providing information about compliance of provisions in the notification, <i>Para E(2)(i)</i>	Yet to start	By 30th of April	SPCB/PCC
20	Compilation of annual reports submitted by thermal power plants by CPCB and CEA, <i>Para E(2)(i)</i>	Yet to start	By 31st of May	CPCB, CEA
21	Constitution of a Committee for monitoring the implementation of the provisions of the notification, <i>Para E(3)</i>	Completed	-	CPCB
22	Meeting of the Committee to review annual implementation reports, <i>Para E(3)</i>	Ongoing	Once in six months	CPCB
23	Committee to hold stakeholder consultation for monitoring of ash utilization, <i>Para E(3)</i>	Ongoing	Once in six months	CPCB
24	Committee to submit six monthly report to MoEFCC, <i>Para E(3)</i>	Ongoing	Once in six months	CPCB
25	Constitution of State Level Committee to resolve disputes between TPPs and users of ash or manufacture of ash based products, <i>Para E(4)</i>	Ongoing	Immediate	CPCB
26	Compliance audit for ash disposal by thermal power plants and user agencies by auditors authorised by CPCB, <i>Para E(5)</i>	Ongoing	Annual	CPCB, SPCB/PCC
27	Audit report to be submitted to CPCB and concerned SPCB, <i>Para E(5)</i>	Yet to start	By 30th November every year	CPCB and SPCB/PCC
28	Initiation of action against non-compliant thermal power plants, <i>Para E(5)</i>	Yet to start	Within fifteen days of receipt of audit report	CPCB, SPCB/PCC

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F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi – 110003

Dated: 9th March, 2023

OFFICE MEMORANDUM

Sub.: Minutes of the second meeting of 'Fly Ash Management and Utilization Mission' held on 31.01.2023- reg.

The undersigned is directed to enclose herewith the minutes of the second meeting of "Fly Ash Management and Utilization Mission" held under the Chairpersonship of Secretary (EF&CC) on 31.01.2023 at 12:00 hrs at Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, New Delhi.

2. It is requested to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As above

Yours sincerely,


(Dr. Satyendra Kumar)

Director

Ph: 011-20819291

Email: satyendra.kumar07@nic.in

To:

1. Secretary, Ministry of Power, New Delhi
2. Secretary, Ministry of Coal, New Delhi
3. Chief Secretary, State of U.P.
4. Chief Secretary, State of M.P.
5. Chairman, Central Pollution Control Board, New Delhi
6. Additional Chief Secretary /Principal Secretary, Environment Department, Government of Uttar Pradesh
7. Additional Chief Secretary /Principal Secretary, Environment Department, Government of Madhya Pradesh

8. Additional Chief Secretary /Principal Secretary, Department of Power, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Department of Power, Government of Madhya Pradesh
10. Additional Chief Secretary /Principal Secretary, Department of Industries, Government of Uttar Pradesh
11. Additional Chief Secretary /Principal Secretary, Department of Industries, Government of Madhya Pradesh
12. Chairman, UPPCB, Uttar Pradesh
13. Chairman, MPPCB, Madhya Pradesh
14. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
15. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
16. CMD, NCL
17. CMD, M/s NTPC Limited
18. CMD, M/s Anpara Thermal Power Plant (Power Plant)
19. CMD M/s Anpara 'C' Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s Renusagar Thermal Power Plant
22. CMD, M/s UPRVUNL
23. CMD, M/s Grasim Industries Limited, Renukoot, Sonbhadra
24. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
25. CMD, M/s M.P. Power Generating Co. Ltd., Madhya Pradesh

Copy to:

1. PPS to Secretary (EF&CC)
2. PPS to AS (NPG)
3. Guard File

**Minutes of the meeting of Fly Ash Management and Utilization Mission
held on 31.01.2023 at 12:00 hrs**

The second meeting on 'Ash Management and Utilization Mission' was convened on 31st January, 2023 at 12:00 hrs for the issues related with industrial pollution in Singrauli and Sonbhdara region of M.P. and U.P. respectively. The list of participants is annexed at **Annexure I**.

(1) During the meeting, **following discussions were held:**

1. The first meeting of the Mission was held on 24th November, 2022 to address the pollution related issues in Singrauli, M.P. and Sonbhdara, M.P. During the meeting, several directions were given by the Mission including timely submission and implementation of the action plan by concerned stakeholders.
2. Based on the recommendations of the Mission in the last meeting, a Secretariat has been established at CPCB for coordination, monitoring, supervision and implementation of activities pertaining to decisions made by the Mission from time to time. CPCB presented the status of activities undertaken as below:
 - i. A web page - "Fly Ash Management and Utilization" – to place relevant information in public domain was created on 13.12.2022.
 - ii. Action plans submitted by power plants, coal mines and industries in Singrauli and Sonbhadra Action Plan have been shared with Oversight Committees members for MP and UP for review and scrutiny.
 - iii. Action plans of power plants and coal mines in Singrauli and Sonbhadra and the latest report of the Oversight Committees for MP and UP (District Magistrate, concerned officers of CPCB RD and State Pollution Control Board) have been scrutinized and common action points were formulated and shared with power plants and coal mines. Updated status of compliance of power plants and coal mines on common action points have been obtained. The same has been shared with State Pollution Control Board, respective Oversight Committees for quarterly verification and furnishing the status to Mission Secretariat.

- iv. The updated status of compliance of action plans for power plants and coal mines and industries have been obtained.
 - v. Action Plans for stone crushers have been submitted by M.P. State Government.
 - vi. Action plans are yet to be received from individual stone crushers from State Government of U.P in respect of Sonbhadra district.
 - vii. Draft guidelines for ash ponds/dykes have been prepared by CEA in consultation with CPCB. In view of the recent amendment notification of Ash Utilisation Notification, 2021, the guidelines are under modification to incorporate the provisions of latest amendments on use of reclaimed ash ponds for setting up of solar and wind energy plants.
 - viii. Oversight Committees for U.P. and M.P. comprising representatives of CPCB, SPCB and DM of concerned States, have submitted the first quarterly report on compliance verification.
 - ix. An account 'Voluntary Contribution Fund for Environmental Restoration & Relief' has been opened jointly by Government of M.P. and MPPCB. The account is yet to be opened by Government of U.P.
 - x. Report w.r.t. public health and risk impact assessment is submitted by Government of M.P. However, Govt. of UP is yet to submit the report in this regard.
3. It was observed that no participation from UP Govt was there.
 4. Several power plants/industries raised concerns regarding disposal of fly ash particularly in respect to the non-availability of mines for backfilling or mixing of ash with external overburden dumps.
 5. M/o Coal has so far identified 32 abandoned coal mines along with availability of volumes for backfilling ash by Thermal Power Plants. Nearly half of these mines have been allocated to TPPs for initiating backfilling of ash.
 6. It was highlighted that a Committee under the chairmanship of Chairman, CPCB with representatives from M/o Coal, M/o Mines, M/o Power, DGMS and IBM has been constituted under Ash Utilisation Notification, 2021 for

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identification of mines for backfilling of mine voids with ash/ mixing of ash with overburden dump including examination of safety, feasibility (not economic feasibility) and aspects of environmental contamination. The committee shall update the list of such mines once in quarter.

7. It was informed that Reliance Sasan Thermal Power Plant with their captive coal mine has completed the study carried out by CIMFR which provided favourable recommendations for mixing of ash with overburden in operational mine. Trials for mixing of overburden and fly ash were completed and DGMS permission was also granted. The activity of mixing of ash with the overburden dump will start soon in Sasan captive coal mine.
8. NCL informed that IIT BHU conducted a study for one of its operational mine and the study found that it is not safe for backfilling with ash. However, Sasan case study was presented by MP Pollution Control Board to NCL and concerned District Magistrate to take up similar studies for backfilling of ash in mine voids.
9. Hindalco Industries informed that they require an abandoned or working mine for disposal of red mud and boiler ash. Studies found that red mud has alkaline in nature and is suitable for backfilling in acidic mines.
10. Gorbi abandoned mine of M/s NCL was allotted to NTPC and UPRVUNL (Anpara TPP) for backfilling of ash in mine voids. NTPC has started backfilling of ash in Gorbi mines whereas, UPRVUNL is yet to start such activity. So far, 0.3 million m³ of ash has been disposed in Gorbi mine.
11. MPPCB has raised concerns of pollution generated from transportation of fly ash from Anpara TPP (UPRVUNL) to Gorbi mine for backfilling of mine voids.
12. The ash utilization percentages of various thermal power plants for FY 2021-22 are presented as below:
 - i. Nigrie, JP Associates- 89.6%
 - ii. Rihand, NTPC- 59.3%
 - iii. Singrauli, NTPC- 57.5%
 - iv. Vindhyachal, NTPC- 53%
 - v. Sasan, RPL- 52.3%

- vi. Mahan, Essar Power- 25.5%
- vii. Anpara C, Lanco- 12.8%
- viii. Obra B, UPVUNL-5.5%
- ix. Anpara A, B & D, UPVUNL-2.6%

13. Ash Utilisation Notification, 2021 mandates all Thermal Power Plants achieve 100% utilization of current ash within 3-5 year compliance cycle as applicable based on the utilisation levels in the FY 2021-22.
14. It was also mentioned that major pollution in Singrauli region of M.P. is predominantly caused by the dust generated due to coal transportation from mines to TPPs, loading and unloading activities of coal near railway sidings.
15. It was mentioned that skill training was provided to SHGs for promoting small scale clay brick manufacturers to switch over to ash based brick units in Madhya Pradesh.
16. It was mentioned that Ash Utilisation Notification, 2021 mandates all building construction agencies within 300 km radius of TPPs to use ash based products/bricks which requires to be implemented by State Pollution Control Board and District Magistrate.

(2) The **following decisions were made** during the meeting:

1. Government of U.P. to submit Action Plans regarding stone crushers in Sonbhadra District and the implementation report on the compliance of the conditions of CTOs as well as ECs in respect of all the industries.

(Action: Env. Dept, Government of U.P.)

2. Government of U.P. to create a separate account to receive voluntary contributions and funds for environment restoration and relief. State Government to take measures for restoration of environment and provide relief to victims of damage in a manner as may be found appropriate from these funds.

(Action: Env Dept., Government of U.P.)

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3. Concerned State Governments to arrange for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries, and share the report with CPCB.

(Action: State Governments of U.P. and M.P.)

4. Oversight Committees comprising CPCB, concerned SPCB and respective DMs shall carry out continued verification of the implementation of action plans by industries in Singrauli & Sonbhadra, and furnish the status report once in quarter.

(Action: Oversight Committees of U.P. and M.P.)

5. Northern Coalfields Ltd. (NCL) to conduct feasibility study in excavated portions of all its operational mines as well as abandoned mines, along with availability of volume for backfilling of ash in mine voids or mixing of ash with external Overburden dumps. A template comprising details of all the mines may be formulated and a report in this regard may be submitted.

(Action: Ministry of Coal)

6. Ministry of Coal and Ministry of Mines to take effective steps for identification of more mines and make them available to coal and lignite based thermal power plants for backfilling and mixing of ash with external overburden dumps, in line with the Ash Utilisation Notification, 2021.

(Action: M/o Coal & M/o Mines)

7. Director General, DGMS may be co-opted as member of the Mission.

(Action: MoEFCC)

8. Committee under the chairpersonship of Chairman, CPCB may convene a meeting for identification of mines as well as for the development of SOP for making operational/abandoned mines available to the TPPs with M/o Coal, NCL, DGMS, NTPC, Anpara-UPRVUNL and other stakeholders, and prepare the plan for studies(mine-wise/region wise or as deemed fit) regarding availability of mines with timelines along with parallel steps for the necessary

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approvals(as that of DGMS), for backfilling of ash and mixing of ash with OB in Singrauli and Sonbhadra region.

(Action: CPCB)

9. All thermal power plants shall scrupulously implement the action plans to achieve 100% ash utilization as per the compliance cycle prescribed under the Ash Utilisation Notification, 2021.

(Action: All TPPs in Singrauli and Sonbhadra region)

10. Action plans of thermal power plants shall also include status of annual safety certification of ash dykes and measures taken to prevent breaches, designation of officer responsible in this regard.

(Action: All TPPs)

11. Anpara TPP, UPRVUNL shall submit the time bound action plan for 100% utilization of ash vis-à-vis present utilization rates, backfilling of ash in Gorbi mines along with the concerns of MPPCB regarding pollution from transportation, and other plans for achieving 100% utilization of ash.

(Action: Govt of U.P., UPRVUNL)

12. Draft guidelines for technical specifications and annual certification of ash ponds/dykes may be finalised.

(Action: CPCB and CEA)

13. A meeting with Ministry of Coal, NCL, NTPC, Indian Railways, other TPPs, owners of private railway siding may be convened to identify mitigation measures for prevention, control and abatement of dust pollution predominantly caused by mining activities and transportation of coal in Singrauli region and furnish a detailed report. Accountability of pollution generated from coal transportation, loading and unloading activities may be fixed on TPPs, coal mines and railway siding (private or public) based on the jurisdiction of activities.

(Action: MPPCB and UPPCB)

14. Skilling and outreach programmes may be conducted on similar lines of training of SHGs by MPPCB for promoting switch over to ash based brick/product manufacturing.

(Action: MP and UP Govt.)

15. Enforcement measures regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs prescribed under Ash Utilisation Notification, 2021, shall be implemented to promote ash based product manufacturing.

(Action: UPPCB, MPPCB and concerned District Magistrates)

16. NHAI may be requested to utilize the ash for the road construction project.

(Action: MoEFCC)

17. As informed, studies found that red mud has alkaline in nature and is suitable for backfilling in acidic mines. Identification of an abandoned or working mine for disposal of red mud and boiler ash may be undertaken, if feasible.

(Action: CPCB)

18. Effective implementation of the mandate of 100% utilisation of ash by TPPs across the country must be ensured. In this regard, the compliance matrix shared along with the minutes of the first meeting must be implemented in a time bound manner and on a regular basis.

(Action: CPCB, CEA, All State Govts (having TPPs), All stakeholders as per Compliance Matrix)

Annexure I

List of Participants

1. Smt. Leena Nandan, Secretary, EFCC
2. Shri. Alok Kumar, Secretary, Power
3. Shri Tanmay Kumar, Chairman, CPCB
4. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
5. Shri Anandji Prasad, Advisor, MoC
6. Dr. Satyendra Kumar, Director, MoEFCC
7. Shri Nazimuddin, Scientist F, CPCB
8. Shri N. Subrahmanyam, Scientist D, MoEFCC
9. Shri Chandra Mohan Thakur, MS, MPPCB
10. Shri Gurdeep Singh, CMD, NTPC
11. Shri Ramesh Babu, Director (Operations), NTPC
12. Shri MVR Reddy, ED, SSEA, NTPC
13. Shri S.K. Takhele, CGM (SEA), NTPC
14. Shri Chetan Awsathi, STA to ED (SSEA), NTPC
15. Shri Gaurav Gahlot, Scientist C, CPCB
16. Shri Durga Nand Jha, JRF, CPCB
17. RO, MPPCB, Singrauli
18. Shri Hemant K. Sharma, Director (Environment), MPPCB
19. Shri R.K. Gupta, Superintending Engineer, MPPCB
20. Shri Gulshan Raj, CE, CD, CEA
21. Shri Amit Kumar, Director, CD, CEA
22. Shri Madan Gupta, COO, Jaiprakash Power Ventures Ltd.
23. Shri M.K.V. Ramanrao, CTO, Jaiprakash Power Ventures Ltd.
24. Shri Jitendra Malik, Director, NCL
25. Shri H.B. Shinde, CM (Environment), NCL, Singrauli
26. Shri Shripal Bhatt, DGM (Civil), NOIDA
27. Dr. Avinash Tripathi, Officer on Special Duty, NOIDA
28. Shri Wasim Ahmed, Senior DGM, Lanco Anpara Power Ltd.
29. Shri Arun Tholia, ED(Commercial), Lanco Anpara Power Ltd.
30. Shri Rajeev Tyagi, P.G.M, UPSIDA
31. Shri Santosh Kumar, DGM, NTPC

32. Shri Guru Prasad, MD, UPRVUNL
33. Shri S.K. Dutta, Director (Project), UPRVUNL
34. Shri Vipul N. Rajyaguru, GM, Grasim Industries
35. Dr. Vijay Yadav, AGM (Environment), Grasim Industries Ltd., Renukoot
36. Shri Sayed M Islam, Manager (EHS), Birla Carbon
37. Shri V R Shankar, President, Aditya Birla
38. Smt. Vaishali Surawar, Hindalco
39. Shri Jitendra Prasad, Add. Vice President, Sasan Power Ltd.
40. Shri Sanjay Singh, Grasim Industries
41. Shri R.N. Shukla, GM (Environment), APL
42. Shri Rohit Kumar
43. Shri Utpal Sarkar
44. Shri Ashwani Tyagi
45. Shri V R Shankar

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F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi – 110003

Dated: 8th June, 2023

OFFICE MEMORANDUM

Sub.: Minutes of the third meeting of 'Fly Ash Management and Utilization Mission' held on 01.05.2023 - reg.


The undersigned is directed to enclose herewith the minutes of the third meeting of "Fly Ash Management and Utilization Mission" held under the Chairpersonship of Secretary (EF&CC) on 01.05.2023 at 11:00 hrs at Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, New Delhi.

2. It is requested to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority

Encl.: as above

Yours sincerely,


(Dr. Satyendra Kumar)
Director
Ph: 011-20819291
Email: satyendra.kumar07@nic.in

To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chief Secretary, State of Uttar Pradesh
5. Chief Secretary, State of Madhya Pradesh
6. Chairman, CPCB, New Delhi
7. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh

8. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
9. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
11. Director General, Directorate General of Mines Safety, Jharkhand
12. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
14. Chairman, UPPCB, Uttar Pradesh
15. Chairman, MPPCB, Madhya Pradesh
16. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
17. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
18. CMD, M/s NTPC Limited
19. CMD, M/s Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s UPRVUNL
22. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
23. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra

Copy to:-

1. PPS to Secretary (EF&CC)
2. PPS to AS(NPG)
3. Guard File

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Minutes of the meeting of Fly Ash Management and Utilization Mission held on 01.05.2023 at 11:00 hrs

The third meeting on 'Ash Management and Utilization Mission' was convened on 1st May, 2023 at 11:00 hrs to review the status of actions taken based on the recommendations of the Mission established in the meeting held on 31.01.2023. The list of participants is annexed at **Annexure I**.

(a) During the meeting, **following discussions were held:**

1. Ash generation and utilization by all TPPs in the country was reviewed. 186 TPPs (2,11,620 MW) generated 262.6 million tonnes during FY 2021-22. Overall ash utilization in the country was 94.7%. The details of ash utilization by TPPs are as below:
 - i. 80 % (1st compliance cycle of 3 years): 144 TPPs
 - ii. 60-80 % (1st compliance cycle of 4 years): 21 TPPs
 - iii. <60 % (1st compliance cycle of 5 years): 38 TPPs
 - 12 TPPs: non-operational; 01 TPP: data not received

2. Ash utilization percentage of various thermal power plants in Singrauli and Sonbhadra region was reviewed. The region generated 29.3 MT during FY 2022-23 and utilized 14.13 MT (48%). The details of ash utilization during FY 2021-22 & 2022-23 are as under:
 - i. Nigrie, JP Associates: 89.55% & 100.8%
 - ii. M/s Sasan TPS: 52.3% & 109.4%
 - iii. M/s Mahan Energen TPS: 25.46% & 100%
 - iv. M/s NTPC Vindhyanchal: 53% & 37.31 %
 - v. M/s Singrauli: 57.5% & 40.16%
 - vi. Rihand: 59.2% & 52.9%
 - vii. Anpara A, B & D, UPVUNL: 2.62% & 1.89%
 - viii. Obra B, UPVUNL: 5.4% & 15.34%
 - ix. Anpara 'C' Lanco TPS: 12.8% & 11.67%

3. M/s Vindhyanchal informed that tender for supplying ash for road construction projects was under process. It was informed that despite the allotment of the Gorbi mine to the power plant, infrastructure development for ash disposal was still in progress.
4. Action plans of stone crushers from Govt. of M.P. were received. Field inspections were carried out by a team of District Collector, SPCB and Mining Officers. Principal Secretary, Environment Dept. Govt. of M.P. reviewed the progress of implementation of action plans on 25.04.2023. Out of 63 stone crushers, the following have installed one or other pollution control measures:
 - 23: dust containment cum suppress system
 - 24: wind breaking wall
 - 60: water sprinkling
 - 43: greenbelt
5. The crushers located in M.P. were directed to install the remaining pollution control measures within three months.
6. Action Plans of stone crushers from U.P. (Sonbhadra District) were submitted on 21.04.2023. Around 200 stone crushers of large capacities are located at single location, causing air pollution in the region. Govt. of U.P. informed that seven defaulters out of 220 stone crushers had been closed and monitoring of air quality is carried out on weekly basis.
7. Oversight Committees of U.P. and M.P. comprising officials from CPCB, SPCB and District Magistrate had carried out field inspections in February, 2023. CPCB forwarded the inspection reports of UPPCB and MPPCB for taking action on violations on 20.02.2023.
8. Principal Secretary, Deptt. Of Environment, Govt. of M.P. reviewed overall progress of actions mandated under the Mission on 25.04.2023 and issued following directions:
 - a. Vindhyanchal TPP, Sasan Power, Mahan Energen, M/s Hindalco, M/s JP Nigrie, were given directions and timelines to install pollution control measures and achieve 100% ash utilisation.

- b. Northern Coalfields Ltd. directed to conduct feasibility study for mixing of ash in OB dumps and backfilling of ash in voids of working mines.
 - c. Coal mines were mandated to procure mechanical sweepers, fog and mist sprinklers for taking up dust mitigation measures.
 - d. Coal mines were directed to set up coal handling plant and railway siding for evacuation of coal through rail to match to the expanded production capacities.
 - e. Jayant, Dudhichua and Nigahi coal mines were issued notices for taking dust pollution control measures for avoiding contamination of water bodies. Notices served to impose environmental compensation.
 - f. Suliyari open cast mine, Amelia coal mine, Mohar and Mohar Amlori coal mine and Amelia north coal mine were directed to set-up concrete roads and procure mechanical sweepers and water sprinkling machines for control of air pollution.
 - g. 8 railway sidings (ECR-3, WCR-3 and NCL-2) were directed for ensuring installation of air pollution control measures.
 - h. PWD was directed to inspect the construction of roads for control of air pollution.
9. Obra TPS had discharged ash into nearby nalla and M/s Anpara TPS had discharged ash into Rihand reservoir from the ash ponds. MPPCB imposed Environmental Compensation on UPRUVNL. The company informed that 51000 m³ of ash from the nalla near to Obra TPS and 66000 m³ of ash from Rihand reservoir had been desilted so far. The desilted ash had been used for filling up of low lying areas.
10. Central Level Working Group constituted under Additional Secretary, Ministry of Coal for allocation of coal mines for disposal of ash convened a meeting on 31.03.2023, and decided that further scientific studies for allocation of working mines for disposal of ash is not required in operational mines in view of safety issues.
11. Studies conducted by CIMFR have shown that backfilling of ash in Gare Palma IV (working mine) providing good results since 15 years and suggested that

similar study may be conducted on mine-to-mine basis. Further, Sasan coal mine has conducted a study regarding mixing of OB with ash and have shown favourable results.

12. NCL has initiated studies to be conducted by CIMFR in operational mines and the reports will be submitted by December, 2023.
13. Ministry of Coal has provided the status of identification of mines for backfilling of ash in mine voids:
 - a. 32 abandoned mines identified
 - Ash filling is ongoing/ completed: 10 mines
 - MoU is in process: 02 mines
 - Identified: 09 mines
 - b. 18 Underground (UG) coal mines of CIL
 - c. 01 Opencast mine and 09 UG mines of SCCL (100 lakh m³ bottom ash is expected to be utilized)
14. Ministry of Mines has identified 82 abandoned mines (other than coal) for filling mine voids with ash.
15. M/s Anpara, UPVUNL has requested NCL and Ministry of Coal to allot pit no. 3 of Gorbi mine for disposal of ash. NCL informed that the proposal will be submitted for Board's approval. Ministry of Coal has informed that Pit no.3 of Gorbi mine will be allocated once all statutory requirements have been met by the respective TPP.
16. NTPC mentioned that TPPs may be notified regarding the closure of the mines in advance as it takes approximately 4-5 years for infrastructure development for transportation and disposal in mine voids.
17. M/s Hindalco informed that signing of MoU between DFO, U.P, Aluminium Association of India and IIFM Bhopal is under process for backfilling of Dala abandoned stone quarry with fly ash and red mud. Request made to NCL to allot one pit of Gorbi mine for filling it with red mud and fly ash.

18. NH39 from Sidhi to Waidhan, Singrauli for about 92 km is constructed by NHAI in M.P. It was requested that ash may be utilized in the said road construction project.
19. Committee of Implementation of Ash Utilization Notification, 2021 and Committee for identification of mines under chairpersonship of Chairman, CPCB convened meeting on 18.02.2023 and Ministry of Coal was requested to update the status of allocation and initiation of backfilling, list out mines likely to be available and undertake mine (operational) specific studies for disposal of ash.
20. CPCB has identified organizations for annual certification of ash dykes in line with Ash Utilization Notification, 2021. Certification of ash dykes of thermal power plants located at Singrauli district have been done during the month of February, 2023.
21. M/o Power issued show-cause notice to 43 TPPs (37 TPP were having less than 60% of ash utilization and 06 TPPs having 60-80% ash utilization percentage). MPPCB and UPPCB issued notices to coal mines for imposing Environmental Compensation for non-compliances and no response was received from the respective Coal mine.
22. MPPGCL made several requests for allotment of abandoned mines of SECL for utilizing ash from Amarkantak TPS, Chachai for backfilling of mine voids with ash. It was informed that SECL is not allotting the said mine voids as it has been transformed into a water body.
23. Respective Committee of MoEFCC, CPCB and SPCBs constituted as per the directions of NGT in O.A. No. 862 of 2022 regarding pollution due to road transportation of ash of thermal power plants in Singrauli and Sonbhadra region carried out field inspections and submitted the reports to NGT in March 2023.
24. In line with Ash Utilization Notification, 2021, CPCB has developed ash portal on 19.12.2022 for enabling TPPs to furnish details of fly ash generation and utilization/ disposal. 180 TPPs out of 186 TPPs have uploaded the ash data on portal.
25. Director, DGMS mentioned that factor of safety of 1.5 is to be maintained to ensure long term stability and safety of OB dumps mixing with ash. Site specific

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studies needs to be done to determine the percentage of ash to be mixed in the OB dumps. Further, ash can be used in place of sand stowing carried for filling up of underground mine voids.

26. The guidelines for technical specifications and annual certification of ash ponds/dykes have been further modified in view of amendment ash notification 30.12.2022 and CEA will obtain concurrence of Ministry of Power on the said guidelines.
27. Govt. of U.P. has directed District Magistrate, Sonbhadra to open a separate account to receive voluntary contributions and funds for environment restoration and relief.
28. Regarding health impact study, Madhya Pradesh Pollution Control Board nominated ICMR- NIREH for conducting health and risk impact assessment studies of operations of TPPs and ash generating industries. Govt. of U.P is yet to submit the status.
29. District Magistrate of Singrauli District, Madhya Pradesh has identified different SHGs and initiated skilling and outreach programme for promoting switch over to ash based brick/product manufacturing under State Rural Livelihood Mission. Action in this regard is yet to be taken by UP Govt.
30. Government of M.P. and U.P. have directed respective District Magistrates to take enforcement measures regarding mandatory use of ash based products/bricks on obligated entities such as building construction agencies.

(b) The **following decisions were made** during the meeting:

1. Allocation of pits no. 3 of Gorbi abandoned mine to Anpara TPP, UPRVUNL for backfilling within one month. Allotment of abandoned mine of SECL to Amarkantak TPP, M.P. to M/s MPPGCL and abandoned mine of WCL to TPPs.

(Action: Ministry of Coal, NCL, SECL and WCL)

2. Updating the list of coal mines approaching for closure of mine in 3-5 years so that TPPs can engage with coal mines for setting up of infrastructure for transportation and disposal of ash in mine voids.

(Action: Ministry of Coal)

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3. Updating information of 82 identified abandoned mines (other than coal) and setting-up procedure for signing of MoU between the identified mines and TPPs. Steps for identification of more mines for enabling TPPs achieve 100% ash utilisation.

(Action: Ministry of Mines)

4. Issue necessary instructions regarding not requiring permission from DGMS for filling up of mine voids and mixing of ash in OB dumps, and SOP for carrying out feasibility studies in respect of all mines.

(Action: Ministry of Coal and Ministry of Mines)

5. Stipulation of specific conditions in Environmental Clearances of coal mines and non-coal mines for conducting feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Ash Utilization Notification, 2021

(Action: MoEF&CC)

6. Utilization of ash in the road construction project NH39 from Sidhi to Waidhan, Singrauli, M.P. for 92 km. MoRTH may be requested to issue necessary instructions to NHAI to engage with TPPs for utilization of ash.

(Action: MoEF&CC and MoRTH)

7. Ministry of Coal may be apprised about the action initiated by MPPCB and UPPCB on environmental non-compliances of coal mines in Singrauli and Sonbhadra region.

(Action: MoEFC&CC)

8. Examination of actions plans submitted by thermal power plants and stone crushers and carry out continued verification of the implementation of action plans of TPPs, Industries, mines and stone crushers in Singrauli and Sonbhadra region.

(Action: CPCB)

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9. Examine the inspection and compliance reports of Anpara and Obra TPPS w.r.t. desilting ash from Rihand Reservoir and Renu River and disposal of desilted ash in low lying areas.

(Action: CPCB)

10. Finalization of guidelines for technical specifications and annual certification of ash ponds/dykes.

(Action: CPCB and CEA)

11. Dust containment and suppression measures are to be taken by the stone crushers. Carry out assessment of air quality in and around stone crushers on regular basis to verify the impact of mitigation measures taken by the stone crushers.

(Action: Stone crushers in Singrauli and Sonbhadra region, MPPCB & UPPCB)

12. All thermal power plants and stone crushers shall update the progress in regard to the implementation of action plans by respective stakeholders.

(Action: All TPPs and stone crushers in Singrauli and Sonbhadra region)

13. Creation of separate account to receive voluntary contributions and funds for environment restoration and relief. State Government to take measures for restoration of environment and provide relief to victims of damage in a manner as may be found appropriate from these funds.

(Action: Env Dept., Government of U.P.)

14. Submission of one-year action plan along with specific deliverables in respect of conducting health and risk impact assessment studies of operations of TPPs and ash generating industries, within one month.

(Action: State Governments of U.P. and M.P.)

15. Enforcement measures regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs prescribed under Ash Utilisation Notification, 2021, shall be implemented.

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(Action: UPPCB, MPPCB, concerned District Magistrates)

16. Skilling and outreach programmes to be conducted on similar lines of training of SHGs by M.P. for promoting switch over to ash based brick/ product manufacturing.

(Action: Govt. of U.P. and M.P.)

17. Anpara TPP and Obra TPP to desilt the remaining ash discharged in Rihand Reservoir and Renu River by May, 2023. Desilted ash disposed in low lying areas to be stabilized with soil cover and grass/ green belt to avoid pollution.

(Action: M/s UPRVUNL)

18. Assessment and monitoring of desilting activities in water bodies where Anpara and Obra discharged ash, and stabilization activities of low lying area where desilted ash is filled up to verify the status of remedial measures taken, by June, 2023.

(Action: UPPCB and Forest Department, Govt. of UP)

19. Inter-state transportation of ash is to be permitted for utilization of ash in the specified eco-friendly purposes along with safeguards for pollution control and mitigation.

(Action: Govt. of UP and M.P.)

20. Submission of action plan indicating the timelines for initiation and completion of feasibility studies for assessing the area and volume available for ash backfilling in mine voids and mixing of ash in OB dumps in all NCL mines.

(Action: NCL)

21. Submission of time-bound action plan for achieving 100% utilization of ash by TPPs. Cost-benefit analysis to be conducted for outweighing benefits of bearing ash transportation cost/promotion of ash based product manufacturing/coal transportation cost vis-à-vis environmental compensation.

(Action: UPRVUNL, NTPC and Anpara Lanco, All TPPs)

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22. A study on mixing of red mud with ash in Gorbi abandoned mine is to be carried out to neutralize acidic water of Gorbi mine pit.

(Action: NTPC and NCL)

23. Effective implementation of the mandate of 100% utilisation of ash by TPPs across the country must be ensured. In this regard, the compliance matrix shared along with the minutes of the first meeting must be implemented in a time bound manner and on a regular basis.

(Action: CPCB, CEA, All State Govts. (having TPPs), All stakeholders as per Compliance Matrix)

Annexure I

List of Participants

1. Smt. Leena Nandan, Secretary, EF&CC
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Shri Deepal Goal, Director, MoC
5. Shri Dheeraj Kumar, DS, M/o Mines
6. Shri Tirupathi Reddy Kommidi, Additional Chief Manager, NLC India Ltd., MoC
7. Shri Nazimuddin, Scientist F, CPCB
8. Shri N. Subrahmanyam, Scientist D, MoEFCC
9. Shri Chandra Mohan Thakur, PDS- Env., GoMP & MS, MPPCB
10. Shri Ajay K. Sharma, MS, UPPCB
11. Shri Mohammed Niyazi, Dir. (S&T), DGMS
12. Shri Ashutosh Kr. Dubey, ADM, Sonbhadra
13. Shri Manjeet K. Sinha, AGM-IT, NTPC
14. Shri MVR Reddy, ED, SSEA, NTPC
15. Shri S.K. Takhele, CGM (SEA), NTPC
16. Shri Chetan Awsathi, STA to ED (SSEA), NTPC
17. Shri Durga Nand Jha, JRF, CPCB
18. RO, MPPCB, Singrauli
19. Shri Hemant K. Sharma, Director (Environment), GoMP
20. Shri Rajendra Singh, CEO, UPPCB
21. Shri R.K. Gupta, Superintending Engineer, MPPCB
22. Shri Umesh Kr. Gupta, AEE, UPPCB, Sonbhadra
23. Shri Gulshan Raj, CE, CD, CEA
24. Shri Amit Kumar, Director, CD, CEA
25. Ms. Rehana Beg, Resident Engineer, M.P. Power Generating Company Limited
26. Shri Ravikant Raut, Chief Chemist, M.P. Power Generating Company Limited
27. Shri M. L. Patel, Chief Engineer, M.P. Power Generating Company Limited
28. Shri Ashok Rai, Mining Officer, Singrauli
29. Shri Ranjeet Nirmal, DMO GBN, Mining Dept. Govt. of UP
30. Shri Sanjeev Kumar, GM (Env. &F), NCL

31. Dr. Avinash Tripathi, Officer on Special Duty, NOIDA Authority
32. Shri R. K. Sharma, Project Eng., Noida Authority
33. Shri M. Narasimha Murthy, V.P., Lanco Anpara Power Ltd.
34. Shri Himanshu Verma, Sr. Manager, Lanco Anpara Power Ltd.
35. Shri Santosh Kumar Singh, Head, Adani, Mohan Energy Ltd.
36. Shri S.K. Dutta, Director (Project), UPRVUNL
37. Dr. Vijay Kr. Yadav, AGM (Environment), Grasim Industries Ltd., Renukoot
38. Shri Sayed M Islam, Manager (EHS), Birla Carbon, Renukoot
39. Shri Ashwani Tyagi, NTPC
40. Shri Vinay Ramaiya
41. Ms. Vaishali Surawar, Hindalco
42. Shri Rajashekar, NTPC
43. Shri P N Sharma, IBM
44. Shri Bharat Bhushan Chugh, Associate, NTPC
45. Shri Debanjan Basak, RPSG
46. Shri Ajit Kumar, NTPC
47. Dr. Neeraj Verma, RRT 1
48. Shri Pushpender Gaur IBM RO, Gandhinagar
49. Prof. (Dr.) Partha Ghosh
50. Shri Surajit Basu
51. Dr. Vinod K Verma, Sr VP, Aditya Birla
52. Dr. Sanjoy Chakraborty, RPSG
53. Ms. Soubhagya Tripathy, Hindalco Aditya Birla
54. Shri Mukesh Mukesh, Aditya Birla

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F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003

Dated: 2nd August, 2023

OFFICE MEMORANDUM

Sub.: Minutes of the fourth meeting of 'Fly Ash Management and Utilization Mission' held on 04.07.2023 - reg.

The undersigned is directed to refer the fourth meeting of 'Fly Ash Management and Utilization Mission' held on 04.07.2023 at 11:00 hrs at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 01.05.2023.

2. In view of the above, minutes of the fourth meeting of 'Fly Ash Management and Utilization Mission' is enclosed herewith.
3. It is requested to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated

Yours sincerely,


(Dr. Satyendra Kumar)

Director

Ph: 011-20819291

Email: satyendra.kumar07@nic.in

To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chief Secretary, State of Uttar Pradesh
5. Chief Secretary, State of Madhya Pradesh
6. Chairman, CPCB, New Delhi

7. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
8. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
9. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
11. Director General, Directorate General of Mines Safety, Jharkhand
12. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
14. Chairman, UPPCB, Uttar Pradesh
15. Chairman, MPPCB, Madhya Pradesh
16. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
17. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
18. CMD, M/s NTPC Limited
19. CMD, M/s Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s UPRVUNL
22. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
23. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra

Copy to:-

1. PPS to Secretary (EF&CC)
2. PPS to AS(NPG)
3. Guard File

**Minutes of the 4th meeting of Fly Ash Management and Utilization Mission
held on 04.07.2023 at 11:00 hrs**

The fourth meeting on 'Fly Ash Management and Utilization Mission' was convened on 4th July, 2023 at 11:00 hr to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 01.05.2023. The list of participants is annexed at **Annexure I**.

a. During the meeting, **following discussions were held:**

1. Central Level Working Group constituted under Additional Secretary, Ministry of Coal for allocation of coal mines for disposal of ash to thermal power plants convened a meeting on 04.05.2023, and allocated Gorbi Pit- 2 and 3 of NCL to NTPC Vindhyanchal and Anpara TPS, UPRVUNL, respectively.
2. Status of allocation of abandoned mines to TPPs for backfilling of ash:
 - i. Sarni UG of WCL allocated to Satpura TPS of MPPGCL: draft MoU has been shared with MPPGCL for acceptance.
 - ii. Sharda OC (OPQR patch) of SECL allocated to Amarkantak TPS, M.P. to M/s MPPGCL-volume of 1.6 lakh m³ (15%) void was made available, out of which 90,000 m³ has been filled so far. Remaining 85% void was made available to MB Power Ltd.
 - iii. Sharada OC of SECL, Trench-1 was allocated to:
 - a. Amarkantak TPS, MPPGCL, Chachai- 0.9 lakh m³ (16 km)
 - b. NTPC, Sipat- 10.93 lakh m³ (187 km)
 - c. NTPC, Korba- 12.53 lakh m³ (199 km)
 - d. SGTPS, MPPGCL, Birsinghpur- 5.63 lakh m³ (78 km)
 - iv. M/s NCL informed that three meetings were held and the draft MoU with M/s UPRVUNL (Anpara TPP) for signing had been shared. M/s UPRVUNL informed that the MoU would be signed immediately within a week for initiation of backfilling activities.

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- v. MPPGCL informed that as per the agreement, 90,000 CuM ash had been filled into the mine void of Sharda OC (OPQR patch) out of allocated void of 1.6 lakh CuM. Sharda OC has a capacity 30 lakh CuM out of which major portion of mine voids was given to M/s MB Power Ltd. It was informed that Amarkantak Power Plant, Chachai of MPPGCL is located at 16 km from the Sharda mine voids and ash can be easily transported to the void.
 - vi. MPPGCL requested to consider the allocation of Trench 2 or 3 of Sharda OC for backfilling of remaining quantity of ash as the mine is located in M.P. and ATPS of MPPGCL does not have any alternate allocation.
3. It was informed that mine void of Sharada OC (Trench 1), Chachai of SECL is used as water reservoir and meets the water requirement for industrial & community use. CIL informed that adjacent void, Trench-2 could be allotted to Amarkantak TPS, MPPGCL, Chachai.
 4. MPPGCL shared that Sarni underground mine of WCL was yet to be allocated as MoU was under finalization due to issues related to mine safety. DGMS in this regard stated that individual mine may conduct scientific study in respect of factor of safety and submit the report.
 5. It was informed that Singareni UG coal mine (SCCL) had filled up fly ash in the mine voids by ensuring the safety parameters. The SOP followed in this regard may be used for ash filling in mine voids of other UG mines.
 6. M/o Coal informed that 22 mines of CIL had been allocated for backfilling activities. The physical progress of ash back filling is dismal. NTPC has filled 32 lakhs CuM ash so far out of 655 lakhs CuM voids made available. NTPC has shared 5-year action plan for utilization of legacy ash. MPPCB was requested to permit 3000 CuM ash transportation per day against 1400 CuM. MPPCB informed that there was no restriction on quantity of ash transportation. However, District Administration allows transportation only during night time to avoid traffic and maintain safety.
 7. M/o Coal informed that about 4-5 operational mines would get closed in next few years and made available for backfilling of ash. NCL informed that two

operational mines of NCL namely Kakri Opencast Project (March, 2024) & Krishnashila Opencast Project (March, 2027) are approaching for closure by March, 2024 and March 2027, respectively.

8. NCL expressed no objection for conducting the study on mixing of red mud with ash in Gorbi abandoned mine and stated that NTPC and Hindalco Industries may carry out the said study on mutually agreed terms. NTPC expressed that appropriate safeguards in regard to discharge of wastewater from the mine into the water bodies may be considered.
9. Feasibility study to assess the area/volume available for ash backfilling and mixing of ash in with OB of NCL mines is ongoing at Nigahi operational mine by CIMFR. Approval for conducting study for Amlori, Jayant, Khadia and Dudhichua mines at M.P. is under process.
10. Ministry of Mines has shared the list of 207 identified non-coal mines for backfilling with fly ash. Further, directions were issued to all the Regional Controllers of Mines to identify more working mines, where mineral was exhausted, for backfilling activities. The list of 207 identified non-coal mines is presented below:
 - i. 82 abandoned mines: list shared earlier
 - ii. 56 mines: surrendered to State Govt.
 - iii. 57 mines: part surrendered
 - iv. Pits of 12 working mines: available for backfilling with fly ash
11. CPCB informed that the list of 207 identified non-coal has been made available on Fly Ash Management Mission's website. CEA has circulated the list to all the TPPs.
12. Anpara TPP has desilted 1.52 lakh CuM deposited ash from Rihand reservoir and desiltation of remaining 50,000 CuM ash will be completed by July, 2023. Further, desilted ash is being used to fill low lying areas. Total 58000 CuM deposited ash have been completely desilted from Renu river by Obra TPP. Desilted ash has been disposed in low lying areas in Obra Sector 2 & 3 and stabilized with soil. Development of green belt is under progress.

13. UPPCB informed that the assessment and monitoring of desilting activities in water bodies due to Anpara and Obra discharged ash will be conducted after June, 2023.
14. Regular inspections are being carried out by UPPCB and MPPCB to verify implementation of action plan by TPPs, stone crushers and industries. UPPCB is yet to submit the compliance report. The Oversight Committee conducted field inspection in the month of May, 2023.
15. Meetings were held under Principal Secretary, Env. Dept., GoMP on 09.05.2023 & 27.06.2023 to review the implementation of action plan and issued following directions:
 - i. NHAI, MP Road Development Corporation and PWD were instructed regarding compulsory use of ash in all the road construction projects in the area.
 - ii. 4 TPPs (NTPC, Amarkantak TPP, Sanjay Gandhi TPP, Shri Shingaji TPP) having % ash utilization less than 55% were directed to submit action plan for 100% ash utilization.
 - iii. NTPC Vindhyanchal was directed to complete modernization process of ESP (within 2 months), install water sprinkler system to control fugitive dust emission from ash dyke and construction of fly ash storage silos (16 hrs capacity).
 - iv. Sasan Power Ltd. was directed for laying 25 km long pipeline for transportation of ash. Mahan Energen Ltd. were directed to complete arrangement of merry-go-round and conveyer system for coal transportation and initiate transportation of ash through rail. Mohar & Mohar Amlori Extension Coal Project of Sasan Power Ltd. was directed to conduct study for mixing ash with overburden.
 - v. All TPPs were directed to submit ash dyke safety study report by reputed institute.
 - vi. NCL coal mines were directed to use 18 procured fog cannons to prevent fugitive dust emission. NCL Amlori Project were directed to establish

ETP. APMDC Ltd. were instructed regarding coal transportation through rail by March, 2025.

- vii. ECL was instructed to construct boundary wall, concrete roads and install water sprinklers in railway sidings by Dec, 2023. WCL was directed for timely completion of construction of Bargavan, Gondwali and Gajara Bahra railway siding.
- viii. 3 stone crushers which have not taken pollution control measures, were directed to be closed and remaining crushers were directed to meet timelines for pollution control.

16. Secretary, Env. Dept. issued directions to the concerned departments for mandatory use of ash based products by all building construction agencies. A meeting was held on 09.05.2023 under Chief Secretary, Govt. of M.P. and 27.06.2023 under PS, Env. Dept. on implementation of action plan. Directions were issued to concerned stakeholders to utilize ash by roads construction agency, ash based products manufacturers and coal mines.
17. UPPCB informed that air pollution control system such as covered conveyer system, covered jaw crusher, water sprinkling arrangement, wind breaking wall, green belt, pucca roads have been installed in all 313 stone crushers and also no new stone crushers is allowed to established. 155 stone crushers were inspected out of which 47 defaulting units were issued show-cause notices under Air Act. Further, an area of 10 Ha is afforested by Miyawaki technique for the control of dust pollution.
18. MPPCB conducted air quality monitoring around Phulwari, Sonbhadra District on 22.06.2023 & 23.06.2023. It was stated that due to the installation of pollution control systems such as water sprinkler, greenbelt development, wind breaking wall and dust containment cum suppress system and due to precipitation on 22.06.2023, the results were found within the prescribed standards (PM_{10} : $100 \mu\text{g}/\text{m}^3$). Further, out of 63 inspected stone crushers, 3 crushers are to be closed and remaining crushers to meet timelines for pollution control.

19. M/s Hindalco informed that pits of Dala abandoned stone quarry is partially filled with water and are available for disposal of fly ash. Formulation of SoP by Aluminium Association of India and IIFM Bhopal is under process for conducting pilot study on mixing of red mud with fly ash for backfilling of Dala abandoned stone quarry.
20. State Govts. informed that inter-state transportation of ash has not been banned and no application was received for inter-state ash transportation.
21. CPCB has finalized guidelines for technical specifications and annual certification of ash ponds/dykes on 27.06.2023.
22. Stipulation of conditions in Environmental Clearances of coal mines and non-coal mines for conducting feasibility studies for assessment of voids for backfilling activities is under consideration by Expert Appraisal Committee (Coal Mining).
23. MoEF&CC on 4.05.2023 requested NHA1 to utilize ash in all road construction projects enabling TPPs to achieve 100% ash utilization.
24. Collector of Singrauli District, Madhya Pradesh had organised a workshop on 24.06.2023 for identified SHGs for promoting switch over to ash based brick/product manufacturing. Further, directions were given to the TPPs for ensuring availability of fly ash to these SHGs. Govt. of U.P. has directed TPPs to organise skilling and outreach programme. TPPs are promoting 31 MSMEs engaged in manufacturing ash based products/ brick manufacturers.
25. Proposals from AIIMS, Bhopal for conducting health and risk impact assessment studies in Sonbhadra and Singrauli region were sanctioned on 30.06.2023 and 27.06.2023, respectively.
26. Govt. of U.P. has opened a separate account to receive voluntary contributions and funds for environment restoration and relief. It was discussed that the funds already collected under Environmental Compensation for recovering damages and remediation activities in Singrauli and Sonbhadra region may be transferred to the accounts recently created by State Government for effective utilisation for improving environment (air, water and soil) specific to this region.

27. Time-bound action plan for utilization of legacy ash were received from NTPC (Rihand Nagar & Shaktinagar), UPRVUNL (Obra TPS & UPRVUNL Anpara TPS) and Lanco Anpara Power Ltd.
28. NTPC informed that they have engaged with NHAI for road construction projects for the supply of ash. Along with this and filling of mine voids would increase the utilisation to 70%.
- b. The **following recommendations were made** during the meeting:

1. SOP to be developed in respect of working mine (opencast and underground mines) for safety related issues in allocation of mines. Also, SOP to be formulated for carrying out feasibility studies for filling up of mine voids in respect of all mines.

(Action: Ministry of Labour and Employment, and DGMS)

2. Updating list of identified abandoned mines for enabling TPPs to approach the concerned mines for backfilling of mine voids with ash for achieving 100% ash utilisation. SOP for signing-up of MoU between the identified mines and TPPs to be finalised.

(Action: Ministry of Mines)

3. Details of SOP followed for Singareni underground mine (SCCL) for ash filling in mine voids may be shared with WCL and NCL for adoption of similar SOP conditions in the MoU to be signed with TPPs. A copy may be shared with MoEFCC.

(Action: Ministry of Coal)

4. Status regarding details of identified mine voids, allocation to TPPs, signing of MoU and quantity of ash filled up against the available volume may be shared and may be put up on the website and updated monthly.

(Action: Ministry of Coal)

5. List of coal mines approaching for closure of mines in 3-5 years to be updated and shared with MoP & TPPs for making early allocation, signing of MoU and preparatory activities for initiation of backfilling of ash.

(Action: Ministry of Coal)

6. A scientific methodology with GIS mapping may be evolved for allocation of mine voids/ mixing of OB dumps with ash to TPPs based on proximity to the mine and transportation distance so that the environmental impacts/ costs of transportation can be minimised. In case of Sharda OC mine (Trench -1, 2 & 3), existing allocation of 90,000 m³ to Amarkantak TPS, MPPGCL may be reviewed and it may be increased as the TPP is 16 kms from the said mine.

(Action: Ministry of Coal)

7. Completion of feasibility study for Nigahi operational mine within two months and submission timelines for initiation and completion of feasibility studies for other working mines for assessment of area and volume available for ash backfilling in mine voids and mixing of ash in OB dumps in all NCL mines. Findings of feasibility study of Nigahi operational mine shall be presented during the next meeting of the Mission.

(Action: Ministry of Coal and NCL)

8. Meeting with all TPPs to get the details about abandoned mines which may be geographically favourable to the TPPs and furnish the list of TPPs along with priority list of abandoned mines.

(Action: MoP, CEA)

9. M/o Labour and Employment and DGMS to be communicated regarding finalisation of SOP in regard to backfilling of ash in open cast and underground mines (for both abandoned as well as working mines) and mixing of ash with overburden in dumps. A separate meeting may be convened with DGMS, M/o Coal and M/o Mines in this regard.

(Action: MoEF&CC)

10. Third-party audit for verification of implementation of action plans of TPPs, industries, stone crushers and coal mines in Singrauli and Sonbhadra region including desilting activities and reclamation of low lying areas carried out, may be undertaken through empanelled institutions/agencies and the report in this regard may be furnished during the next meeting of Mission. CPCB may work

out the cost to be incurred by individual industry in case of unit specific audit and jointly by cluster of industries in case of cluster specific audit.

(Action: CPCB)

11. In order to ensure 100% utilization of ash by all lignite and coal based thermal power plants across the country, effective monitoring and supervision of provisions of Ash Utilization Notification dated 31.12.2021 have to be scrupulously complied with. Respective stakeholders have been mapped in respect of the various activities mandated under the notification which has been shared with CPCB with the minutes of previous meeting. CPCB to coordinate with all the regulatory/enforcing agencies and ensure the compliance of all the activities in a time bound and on a regular basis

(Action: CPCB, MoP, CEA, All State Govts, All stakeholders)

12. Directorate of Mines and Geology may update the list of abandoned mines available in their respective States and make it available on State Govts. website including abandoned stone crushers. This may be put up on the website and updated every month.

(Action: State Govts. of U.P. and M.P.)

13. Environmental Compensation collected by respective SPCBs from the industries of Singrauli and Sonbhadra region prior to the opening of specific accounts and kept in common EC fund, may be transferred to respective accounts created by the State Govts, in addition to voluntary contributions. A mechanism to be put in place to utilise the funds received from this region to be used only for the said region for restoration of environment and relief. Further, State Forest Department may be engaged for carrying out measures for restoration of environment.

(Action: State Govts. of U.P. & M.P.)

14. Increase in utilisation of quantum of ash for making ash based products or eco-bricks through SHGs may be assessed by comparing pre- and post-skilling and outreach programmes. This may be updated every three months. SHGs to be

involved in making eco-bricks that can be used in tree plantation/afforestation, toilet construction activities of the public utility projects.

(Action: State Govts. of U.P. & M.P.)

15. Implementation of effective enforcement measures regarding mandatory use of ash based products/bricks by all building construction agencies within 300 km radius of TPPs as prescribed in Ash Utilisation Notification, 2021 and implementation of additional measures beyond the Notification, to minimise the disposal of ash in mine voids and low lying areas.

(Action: State Govts. of U.P. and M.P.)

16. Study on mixing of red mud with ash and its environmental aspects such as leaching of heavy metals into ground and surface water may be conducted and the results may be shared with CPCB.

(Action: State Govt. of M.P., MPPCB)

17. Ambient air quality monitoring in and around stone crushers to be conducted and baseline data of last two years (same season) be analysed to verify impact of mitigation measures taken by stone crushers. This may be carried out on a regular basis and data may be compiled in a continuous manner to assess the improvements as well as its sustainability. Carry out continuous evaluation of CEPI Score of Singrauli and Sonbhadara region and compile the data over the time in a continuous manner to assess the progress made. A presentation in this regard along with the implementation of CEPI action plan and verification/monitoring of desilting activities of Obra & Anpara (UPRVUNL) may be made during next meeting of the Mission.

(Action: State Govts. of U.P. and M.P., UPPCB and MPPCB)

18. SOP to be laid down for stipulation of measures to be taken during road transportation of ash, in the permission/ Consent to Operate issued for backfilling of mine void with ash and mixing the ash with OB.

(Action: State Govt. of U.P. and M.P., MPPCB and UPPCB)

19. Finalization and signing of MoU with M/s NCL for initiation of backfilling activities in Gorbi Pit-3, within a week and timelines for commencing backfilling activities to be shared. Action taken report in this regard may be submitted to the MoEF&CC.

(Action: State Govt. of U.P., Anpara TPP, UPRVUNL, MoC and NCL)

20. Carry out desiltation of remaining quantity of ash discharged in Rihand reservoir by Anpara TPP. Desilted ash disposed in low lying areas to be stabilized with soil cover and grass/ green belt. Progress to be updated on the website on monthly basis.

(Action: State Govt. of U.P., Anpara and Obra TPP, UPRVUNL)

21. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd and 3rd meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

Annexure I

List of Participants

1. Smt. Leena Nandan, Secretary, EF&CC
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Sh. Anandji Prasad, Advisor (Project), MoC
5. Dr. Satyendra Kumar, Director, MoEFCC
6. Shri Tirupathi Reddy Kommidi, Additional Chief Manager, MoC
7. Shri, Anupam Shukla, Special Secretary, Department of Additional Sources of Energy, Govt. of U.P.
8. Shri Chandra Mohan Thakur, MS, MPPCB
9. Shri Ajay K. Sharma, MS, UPPCB
10. Shri Ashutosh Kumar Dubey, ADM, Sonbhadra, U.P.
11. Shri Nazimuddin, Scientist F, CPCB
12. Shri N. Subrahmanyam, Scientist D, MoEFCC
13. Shri Upendar Rapolu, Deputy Director, S&T, DGMS
14. Shri Amit Kumar, Director, CD, CEA
15. Shri P.S. Mohan Kumar, Deputy Director, CEA, MoP
16. Shri Ashish Kumar, Senior Mines Officer, Directorate of Geology and Mines, GoUP.
17. RO, MPPCB, Singrauli
18. Shri R.K. Gupta, Superintending Engineer, MPPCB
19. Shri Gaurav Gahlot, Scientist C, CPCB
20. Shri Ramesh Babu, Director (Operations), NTPC
21. Shri S.K. Takhele, CGM (SSEA), NTPC
22. Shri G., Rajashekar, GM (AMG), NTPC

23. Shri Ashwani Tyagi, DGM, NTPC
24. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
25. Shri S.K. Dutta, Director (Technology), UPRVUNL
26. Shri Anand Kumar, Chief Engineer, UPRVUNL
Shri Ravikant Raut, Chief Chemist, MPPGCL
27. Ms. Rehana Beg, Resident Engineer, MPPGCL
28. Shri Himanshu Verma, Sr. Manager, Lanco Anpara Power Ltd.
29. Shri Mukesh Mittal, Vice President (Env. & Sustainability), Hindalco
30. Shri Vinay Kr. Yadav, AGM (Environment), Grasim Industries Ltd.,
31. Renukoot
32. Dr. Vinod K. Verma, Head Regulatory Affairs, Hindalco
33. Shri Shripal Singh, DGM (Civil), NOIDA
34. Shri S.K. Bhargava, Executive Engineer, MPIDC, Bhopal
35. Shri Shubham Pundeer, Manager (Project), YEIDA
36. Jitendra Prasad, Additional Vice President (EHS), Sasan Power Ltd.
37. Shri K.K. Mahobe, CE Civil AU& PC
38. DMF, Singrauli, MP
39. CSPGL

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F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi – 110003

Date: 24th November, 2023

OFFICE MEMORANDUM

Sub.: Minutes of the fifth meeting of 'Fly Ash Management and Utilization Mission' held on 19.10.2023 - reg.

The undersigned is directed to refer the fifth meeting of 'Fly Ash Management and Utilization Mission' held on 19.10.2023 at 11:00 AM at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 04.07.2023.

2. In view of the above, minutes of the fifth meeting of 'Fly Ash Management and Utilization Mission' is enclosed herewith.
3. It is requested to furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated

Yours sincerely,


(Dr. Satyendra Kumar)

Director

Ph: 011-20819291

Email: satyendra.kumar07@nic.in

To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chief Secretary, State of Uttar Pradesh
5. Chief Secretary, State of Madhya Pradesh
6. Chairman, CPCB, New Delhi

7. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
8. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
9. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
11. Director General, Directorate General of Mines Safety, Jharkhand
12. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
14. Chairman, UPPCB, Uttar Pradesh
15. Chairman, MPPCB, Madhya Pradesh
16. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
17. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
18. CMD, M/s NTPC Limited
19. CMD, M/s Lanco Anpara Power Pvt. Ltd.
20. CMD, M/s Hindalco Industries Ltd.
21. CMD, M/s UPRVUNL
22. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
23. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra

Copy to:-

1. PPS to Secretary (EF&CC)
2. PPS to AS(NPG)
3. Guard File

Minutes of the 5th meeting of Fly Ash Management and Utilization Mission held on 19.10.2023 at 11:00 AM

The fifth meeting of 'Fly Ash Management and Utilization Mission' was convened on 19th October, 2023 at 11:00 AM to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 04.7.2023. The list of participants is enclosed as Annexure I.

2. At the outset, Secretary welcomed all the participants. Addl. Secretary, MoEF&CC briefed about the recommendations/decisions made by the Mission in last meeting held on 04.07.2023.

3. A presentation was made by the Madhya Pradesh Pollution Control Board on the progress of implementation of various decisions of the Mission. The following details were presented:

(i) 5 Thermal Power Plants, 8 Coal mines (NCL), 56 Stone crushers, and 08 railway sidings (03 ECR; 03 ECR; 02 NCL) have submitted the action plans for implementation of pollution control measures. Periodical monitoring of action plans for TPPs, coal mines and Industries is carried out by the Board. Status of implementation of action plan and its progress has been shared with CPCB and also uploaded on MPPCB website.

(ii) Status of ash utilisation by 5 TPPs in Singrauli region of MP were presented:

TPP name	Year 2021-22		Year 2022-23		Year 2023-24 (till Sept.)	
	Generation of ash (L MT)	Utilisation (%)	Generation of ash (L MT)	Utilisation (%)	Generation of ash (L MT)	Utilisation (%)
NTPC Vindhyachal Singrauli	82.38	53.05%	76.64	37.31%	33.95	57.53%
Sasan Power Limited	53.47	52.35%	45.99	109.5%	23.85	99.1%
Mahan Energen Limited	8.36	25.46%	9.08	100.2%	6.68	117%

Jaypee Nigrie Super TPP Vill. Nigrie, Singrauli	15.79	89.55%	14.55	100.09%	9.22	86.48%
Hindalco Industries Ltd, Mahan Aluminium, Singrauli	11.54	85.55%	11.82	79.4%	5.69	134%
Total	171.54 LMT	56.96%	158.08 LMT	70%	79.4 LMT	83.87%

(iii) Status of utilisation of 15 thermal power plants (including TPPs in Singrauli) in Madhya Pradesh was presented:

Year	Ash generation (LMT)	Ash utilisation (LMT)	Utilisation (%)
FY 2021-22	285.12	176.99	62.07%
FY 2022-23	303.06	223.8	73.84%
FY 2023-24 (till Sept)	154.91	131.55	84.92%

(iv) Out of 303.06 LMT ash generation in FY 2022-23, 43.79 LMT ash utilized for backfilling in Gorbi pit and low lying areas, 10.32 LMT supplied to brick manufacturing and 70.41 LMT for others purposes.

(v) 04 Thermal Power Plants in MP have low utilisation levels of ash, namely NTPC Vindhyachal (57.53%), NTPC Gadarwara (65.31%), Sanjay Gandhi TPS, Umaria (63.95%), Amarkantak TPS, Chachai (78.8%) in FY 23-24 (up to September 2023)

(vi) MPPCB issued permissions for ash utilisation in low lying areas with total area of 750.9 ha in 62 sites with capacity more than 218.5 LMT out of which 86.96 ha was utilised in 22 sites by various thermal power plants and agencies.

(vii) NTPC Vindhyanchal informed that 70% of ash generated is supplied to NHAI projects. NTPC submitted a plan to reach utilisation of 81.16% by end of FY 2023-24 from the current utilisation of 57.33%.

(viii) Chief Secretary, Govt. of M.P. directed all the stakeholders viz. NHAI, PWD, MPRDC, MPBDC & Works Department to use ash based products/bricks within 300 km radius of TPPs.

(ix) Skilling and outreach programmes for training of SHGs have been conducted by District Collector Singrauli to promote manufacturing of ash based products/bricks.

(x) Principal Secretary, Env. Dept., GoMP reviewed the implementation of action plans and air quality improvement in Singrauli region on 13.09.2023 and following directions were issued:

- a. SECL was directed to allocate abandoned mine void of Sharda opencast mine Trap-T1 to Amarkantak TPS, Sanjay Gandhi TPS.
- b. Decision on permission for inter-state transportation of fly ash from TPPs to Gorbi mine will be taken on the basis of merits of the activity.
- c. Central Laboratory, Bhopal was directed to complete the study on mixing of red mud with fly ash in Gorbi mine.
- d. NTPC Vindhyanchal was directed to install dust control arrangements. Instructions were given to Sasan Power Plant for removal of fly ash from Thargatta and Garya drain and be verified by Oversight Committee.
- e. All TPPs in Singrauli were directed to complete all pending activities recommended by the Mission.
- f. NCL was directed to complete the feasibility study for mixing of 25% ash in overburden of mines by CIMFR.
- g. East Central Railway and West Central Railways Siding Managements were directed to take coal dust emission control measures. Further, it was directed to communicate Chairman, Railway Board regarding non-implementation of action plan.

(xi) The measures namely, adequate capacity of silos to store fly ash, transportation of ash by bulkers, facility for washing of wheels of transportation trucks, keeping pond ash in moist condition (about 15%), installing permanent sprinklers, road sweeping through mechanical sweepers have been ensured at TPPs to prevent fugitive dust from ash handling and storage activities.

(xii) Out of 56 stone crushers in Singrauli region, 48 stone crushers have installed dust containment system, 41 have constructed wind breaking wall and 48 have arrangements for regular cleaning and wetting system. Further, 8 stone crushers were closed by Collector, Singrauli due to non-compliance. MPPCB conducted monitoring near stone crushers and PM10 levels were found within norms.

(xiii) Air quality analysis has been carried out in the Singrauli region during Dec, 2021- Sept, 2022 and Dec, 2022-Sept, 2023. Air Quality Index (AQI) has marginally improved from 157 in 2021-22 to 130 in 2022-23. There has been significant improvement in air quality during July-September.

(xiv) Action plans were submitted by 01 TPP and 07 NCL coal mines including Municipal Corporation Singrauli (MCS) for bringing down CEPI score. CEPI score in Singrauli region was assessed by CPCB action plan calculated by CPCB (May, 2022) was 61.38 and 45.17 by MPPCB (Aug., 2023) which is out of severely polluted area category.

(xv) The following activities from the action plan of various industries in M.P have been reported under progress:

- M/s NTPC Vindhyachal STPP, Singrauli (13 units):
 - a. Installation of FGD for SO₂ in 12 units
 - b. NOX emission control measures
 - c. % increase in fly ash utilization
 - d. R&M for Unit-4 – Commissioning job
 - e. Installation of sprinklers at ash dyke V1, V2, V3A & V3B
 - f. Arrangement for 01 Mechanized cleaning machine
- M/s Sasan Power Limited
 - a. Installation of FGD for SO₂ removal
 - b. Construction of pipeline for ash transportation
 - c. Sprinkling system in ash dyke
 - d. Submission of NEERI Report for breach of ash dyke
- M/s Mahan Energen limited:
 - a. Installation of FGD for SO₂
 - b. Development work of railway siding
 - c. Transportation by Merry go round
- M/s Hindalco Industries Ltd. Mahan, Aluminium, Bhargwan, Singrauli: Installation of FGD installation for SO₂ in Unit-1,2,3,4,5 and construction of RCC road

- Jaypee Nigrie Super Thermal Power Plant:
 - a. Installation of FGD for SO₂
 - b. Verification of Ash dyke safety report
 - c. Permanent sprinkling system at fly ash dyke
- Northern Coalfields Ltd., Singrauli: Submission of report on study conducted by CIMFR on backfilling of fly ash in OB in Nigahi Mine by December 2023.
- NCL, Amlori Project: RCC approach road and set-up treated water storage tank of 10 lakh Lt capacity
- NCL, Nigahi: Set- up additional 10 MTPA CHP and construction of CC Road
- NCL, Jayant Project: CConstruction of sedimentation pond & Pump house and arrangement for truck mounted mist spray (01).
- NCL, Block-B Project:
 - a. 4.5 MT coal handling plant
 - b. Laying of roads
 - c. 02 new fixed fog machines
- NCL, Dudhichua Project
 - a. 10 MT Coal handling plant
 - b. Dudhichua sector A to Jayant tiraha road
 - c. Additional 08 nos. stationery fog canons
 - d. New ETP of capacity 30 MLD & New Bunds
- NCL, Bina ext.
 - a. Construction of CHP of 9.5 MTPA Capacity
 - b. WBM to RCC of 4.8 kms
 - c. 02 new fixed fog machines
 - d. ETP up gradation- No progress

- APMDC Ltd.-Sulyari Open Cast Project: Set-up of coal handling plant and 5.2 KM (500 m added) chainage work.
- Sasan Power Limited (Moher & Moher Amlohri extension coal mine):
 - a. Utilized approx 30,000 MT fly ash with OB dump since April-23 to June-23. Backfilling stopped due to monsoon.
 - b. Procure mist canon for dust suppression.
 - c. Rehabilitation and resettlement of affected people.
- Jaiprakash Power Ventures Ltd., Amelia (North) Coal Mine: Not agreed to use fly ash with OB dumps. Procurement of 10 no. fog cannons.
- THDC India Ltd., Amelia Coal Block (New mine):
 - a. Coal handling plant
 - b. Remaining 2.32 km road construction
 - c. Set-up ETP of 10 kl
- East Central Railway, Spur III & X
 - a. Fixed water sprinklers
 - b. Green belt
 - c. Work as per CPCB Guidelines
- East Central Railway, Mahedaiya
 - a. Fixed water sprinklers
 - b. Green belt
 - c. Work as per CPCB Guidelines
 - d. Wind breaking wall
 - e. Approach road
- West Central Railway: Gajra Bahra, Gondawali and Bargawan:
 - a. Dust Protection walls
 - b. Water sprinkling system or tankers

- c. Drainage facility
- d. A pucca circulating handling area
- e. All weather approach Road
- f. Green belt around the coal siding area

(xvi) MPPCB constituted a four-member Committee under the chairpersonship of District Collector of each District for identification and allotment of abandoned non-coal mines to TPPs.

4. A presentation was made by the UP Pollution Control Board on the progress of implementation of various decisions of the Mission. The following details were presented:

(i) Obra TPS and Anpara TPS of UPRVUNL, Shaktinagar TPS & Rihand Sagar TPS of NTPC, Renusagar TPP of Hindalco, Lanco Anpara TPP have submitted the 05-year action plan for 100% utilisation of ash.

(ii) 06 Thermal Power Plants in Sonbhadra region have furnished the 05-year action plan for 100% utilisation of ash:

- a. M/s UPRVUNL, Anpara TPS:
- b. M/s UPRVUNL, Obra TPS
- c. M/s NTPC Shaktinagar TPS.
- d. M/s NTPC Rihand Nagar.
- e. M/s Hindalco Industries Ltd. (Power Division), Renusagar, Sonbhadra.
- f. M/s Lanco Anpara Power Ltd., Anpara, Sonbhadra

(iii) Ash utilisation in Sonbhadra region by 06 Thermal Power Plants is presented as below:

Ash quantity/Year	2021-22	2022-23	2023-24 (till Sept.)
Total quantity of ash generation	15.11 LMT	16.19 LMT	8.06 LMT
Quantity of ash utilization	5.79 LMT	5.68 LMT	3.48 LMT
% utilization of ash	38.3%	35.1%	43.2%

(iv) Out of 5.7 LMT utilisation of ash in 2022-23, the majority of the quantity (3.5 LMT) is utilised in roads, flyover and other construction activities.

(v) NTPC informed that a project is undertaken to convert bottom ash into sand. The arrangements are made to segregate bottom ash and fly ash disposed in a pond so as to enable conversion of bottom ash in to sand.

(vi) UPRVUNL for Anpara TPP civil, mechanical and electrical contracts will be placed in a month. MPPCB issued permission for transportation of ash from Anpara TPP to Gorbi mine. The ash backfilling activities are expected to start by December, 2023.

(vii) Details of coal transportation by NCL mines is presented as below:

Mine name	Mode of transportation (%)		
	Rail	Road	Aerial Ropeway
Dudhichua	77.72%	18.4	3.9
Bina	69.41	30.6	-
Khadia	70.5	29.5	-
Krishanshila	53.9	12.9	33.2
Kakri	57.65	42.34	-
Total	70.36	23.74	5.9

(viii) An amount of 58,000 m³ of deposited ash of Obra TPP (UPRVUNL) has been desilted from Renu/Rihand River and deposited in low lying areas in Obra Sector 2&3. Soil stabilization work of low lying areas has been completed and Miyawaki afforestation is carried out.

(ix) An amount of 206540.944 m³ visible ash Anpara TPP (M/s UPRVUNL) from side pocket of Rihand Reservoir has been removed and filled in low lying areas. Stabilization of ash in low lying area with soil cover has been completed and plantation work is in progress.

(x) Presently, 31 Fly ash based brick manufacturing units are operational in Sonbhadra. To increase utilization of ash based products, UPPCB issued directions to Thermal Power Plant vide letter dated 09-05-2023 to submit action plan for utilization of fly ash as per Fly Ash Notification dated 31.12.2021 and monthly progress report to CPCB and UPPCB, and organize workshop to encourage manufacturing of Fly ash based Products.

(xi) Chairman, UPPCB directed different departments on 15.05.2023 for utilization of fly ash and fly ash based products within 300 Km radius of TPPs and to provide the progress report.

(xii) A workshop held on 07.10.2023 at UPRVUNL Obra, Sonbhadra to promote Ash Utilization in manufacturing of Fly Ash Bricks and in other sectors with Fly Ash Bricks Units, TPPs and District Administrative and SPCB.

(xiii) In regard to fugitive dust emissions from ash handling and transportation, the measures namely, storage of ash under covered sheds, transportation of dry fly ash in closed tankers, arrangement at TPPs for washing of wheels of the trucks transporting ash, transportation of pond ash within water conditioning (minimum moisture of 15%) have been taken by Thermal Power Plants.

(xiv) Out of 313 Stone crushers in Sonbhadra area, 215 stone crushers have adequate Air Pollution Control Systems (APCS) such as covered conveyer system, covered jaw crusher, water sprinkling arrangement, wind breaking wall, green belt, pucca roads. 98 Stone Crushers are yet to install adequate APCS. Board issued show cause notices to 98 nos. of stone crusher units U/s 31-A of Air Act 1981, on 28.06.2023, 22.09.2023 & 25.09.2023 in which APCS were not adequate. Out of 98 units, closure directions issued against 17 Nos. of stone crusher units.

(xv) No new stone crusher is allowed to be established in District Sonbhadra. To control the dust emission and increase visibility on the road in the evening, all stone crushers are directed to stop operation between 5.00 PM to 10.00 PM daily.

(xvi) Air quality was analysed in the Sonbhadra region to see the impact of implementation measures by various industries. PM10 levels have improved in 2022-23 as compared to the last year. PM10 levels are 131 ug/m³ in 2022-23 (Upto Sept) as compared to 167.4 ug/m³ in 2021-22. AQI is 135.2 in 2022-23 as compared to 141.04.

(xvii) To bring down the CEPI scores, Action Plans were prepared for restoration of Polluted river stretch of River Rihand, Stretch-Renukoot and River Son Stretch-Chopan. All industries generating effluents have installed ETP/STP for treatment of Industrial/Domestic effluents and are achieving ZLD. Domestic sewage of cities Renukoot and Pipari contribute to the organic load of the Rihand river. Directions issued to concerned ULBs for survey and inventorization of drains discharging in Rihand river.

(xviii) CPCB assessed CEPI Score for Sonbhadra region and was 67.88 in May, 2022. UPPCB has re-assessed the CEPI Score in August, 2023 and is at 49.2 which is out of severely polluted area category.

(xix) Voluntary Contribution Fund for environmental restoration and relief has been opened by D.M. Sonbhadra. D.M. Sonbhadra has to provide Action Plan for restoration of Environment of District Sonbhadra, which has to be submitted to Hon'ble NGT by UPPCB for permission of transfer of EC fund.

(xx) MoU is under execution with AIIMS Bhopal for Initiating the Public Health and Risk Impact Assessment study due to fly ash consisting of 3 projects whose duration of completion is 6 months to 2 years.

(xxi) MoU between M/s NCL Singrauli (M.P.) & M/s UPRVUNL-Anpara has been signed on 15th July, 2023 for backfilling fly ash generated from Anpara TPP in Gorbi Open Cast Abandoned Mine (Pit No.-03) of NCL Singrauli (M.P.). The estimated volume of void filled with acidic water is approximately 13 Million cubic meter (Gorbi Pit-3), which will be made available for filling with fly Ash. M/s NCL Singrauli (M.P.) has given consent to allow UPRVUNL-Anpara for filling of Fly ash in Pit-3 of abandoned Gorbi mines. Permission for road transport of fly ash to Gorbi mines is awaited from District Administration, Singrauli.

(xxii) UPPCB issued directions to Northern Coalfields Ltd, Sonbhadra on 09.05.2023 to submit action plan for back filling of ash in abandoned mines and conducting feasibility study for mixing of Fly ash in back filling of Live mines. UPPCB has directed on 21.06.2023 to 05 NCL Mines Projects, Sonbhadra to provide status of Back filling of live mines void with ash mixed with OB. Action plan of NCL is awaited.

(xxiii) Director, Geology and Mining Department, Govt. of U.P. on 16.10.2023 has shared the details of 10 abandoned mines in Sonbhadra (6 nos) and Jhansi (04 nos) region with TPPs for taking necessary steps for backfilling of ash.

(xxiv) To prevent fugitive dust emissions from mines and coal transportation, the measures namely, coal transportation by tarpaulin covered trucks, installation of CCTV camera at the mine exit for continuous monitoring of trucks, covered belt conveyor from coal crusher to rake loading point, water sprinkling measures at material transfer points, water sprinkling through truck mounted mist guns and mobile tankers for within mine premises are under taken by coal mines.

5. M/o Coal has presented the status of identification mines for taking up backfilling of ash or ash mixing with Overburden in mine voids.

i. Details of 10 new identified mines are presented as below:

a. SECL:

- Dugga void (Volume: 170 LCuM) is filled with water.
- Bishrampur mine void (Volume: 17 LCuM) is partly filled with water as well as prohibitory orders imposed by DGMS under Sec. 22A (2).

b. WCL: Dhorwasa OC (Volume: 100 LCuM) allocated to MAHAGENCO

c. CCL:

- Govindpur UG (Volume: 0.85 LCuM) allotted to DVC/STPS (Bottom ash could be filled for stowing)
 - Dakra (Volume: 214.5 LCuM) allotted to Patratu: Mine is currently running and will be available from year 2023-24.
 - Dakra-Bukbuka allocated to Hindalco Industries: available form year 2027-28.
 - New selected Dhori UG allocated to DVC (CTPS): after end of life of the mine
 - d. MCL: Jaganathpur OCP (Quarry VII) allocated to JTPS
 - e. NCL: Krishnashila allocated to NTPC Singaruli.
 - f. SCCL Medapalli OC (Volume: 2164.3 LCuM): mine void is 500 m away from Godavari river hence, no dumping of ash can be done.
- ii. Central level Working Group recommended the following mines to various TPPs in its meeting held on 21.9.2023:
- f. CIL-MCL mines, Jagannath OCP (Quarry VIII) to Jindal India Thermal Power Ltd.
 - g. CIL-CCL Dakra-Bukbuka mine to Hindalco Industries Ltd. (cogen Power Plant) for filling from FY 2027-28 onwards.
 - h. CIL-CCL New Selected Dhori UG mine to NTPC Singrauli after end of life of mine
 - i. CIL-NCL Grobi Pit 1 & 2 to NTPC (Singrauli TPS)
- iii. A meeting was held under AS, MoEF&CC on 04.09.2023 for finalization of SOPs. MoC was directed to finalize SOPs based on the recommendation of the Committee constituted by MoC within one month.
- iv. SOPs in regard to safety related issues in allocation of mines and backfilling of ash in opencast and underground (operational and abandoned) and mixing of ash with OB dump to be finalized by M/o Coal. A committee has been constituted comprising DGMS and representatives of MoP, NTPC and CIMFR.
- v. NTPC informed of the challenges faced for signing MoU with mining operators for backfilling of ash in abandoned mines such as paying of lease rent, obtaining permission from DGMS and depositing funds in escrow account.
6. DGMS informed that a Guidelines for scientific study in opencast mines under Regulation 106 (2) of Coal Mines Regulation, 2017 by DGMS (Tech.) has been issued vide

circular no. 03 dated 16.01.2020 all the mine owners/ agents/ managers of opencast working coal mines and was advised to conduct a mine specific scientific study in respect of slope stability and other parameters, before commencing opencast working and submit the report. Factor of safety 1.5 to be maintained for permanent & long standing slopes. No prior permission provisioned for dumping fly ash in overburden dumps. In case of underground mines, scientific study may be conducted and based on the report backfilling activities may be carried out. The following has been summarised:

- a. **U/g working mines:** ash filling in mine voids require scientific study as well as permission from Regional Director General of Mines. DGMS issues permission within a period of 3 months after the submission of requisite study.
 - b. **Opencast working mines:**
 - i. ash filling in mine voids require scientific study to be furnished to DGMS office. No permission from DGMS is required.
 - ii. Ash mixing with OB dumps: No study and permission is required. However, safety considerations such as Factor of Safety of 1.5 is to be maintained.
 - c. **Abandoned mines:** No study and permission is required from DGMS once the mine is abandoned and lease is handed over to State Government or concerned authority.
7. CPCB made presentation on action taken on the decisions made by the Mission in its last meeting held on 04.07.2023.
- i. Status of implementation of action plans by 18 TPPs/ coal mines/industries as verified by the Oversight Committees empowered by Hon'ble NGT in June, 2023 is presented below:
 - a. Lanco Anpara C and NTPC Rihand will install FGD by Dec., 2025 and Dec 2026, respectively.
 - b. Grasim Industries Ltd. Chemical Division, Renukoot to shift mercury bearing brine sludge from factory premises to TSDF. The matter is sub-judice before the Hon'ble Supreme Court and is presently under stay.
 - c. Partial implementation of action plan w.r.t. ZLD for domestic effluent and control of fugitive emissions by HINDALCO Aluminium Smelter.
 - d. 8 TPPs/ coal mines (NTPC Singrauli, Renuagar TPP, UPRVUNL Anpara TPS, UPRVUNL Obra TPS, NCL Dudhichuwa Mine, NCL Kakri Mine, NCL Khadia

Mine, Sasan Power Ltd.) have extended their tentative time limits for implementation of specific plans/points. NCL Bina and NCL Krishnashila yet to implement action plans within timeframe set earlier.

- e. NTPC Singrauli and Anpara TPS are implementing measures to completely stop the discharge of ash pond overflow/ wastewater into the Rihand reservoir. Obra TPS has stopped ash pond overflow water carrying ash into the Renu river.
 - f. The trucks transporting coal from coal mines to TPPs are covered with thin LDPE sheets/ green net only, instead of tarpaulin resulting spillages at several locations. Fine coal dust was found along public road (Auri Mode-Shakti Nagar) and the black powder is also visible on the houses built along the roadsides as well as vehicles parked.
- ii. Updated status of action taken on decisions of 1st, 2nd, and 3rd meetings of the Mission obtained from the stakeholders are as follows:

Meeting	No. of Decisions	Complied	Regular activities*	Time-bound/ Yet to comply**
1 st	11	7	3	1
2 nd	18	13	2	3
3 rd	23	12	4	7

*All 9 decisions points repeated in 4th meeting's decisions

**6 decisions points repeated in 4th meeting's decisions. Remaining 5 decisions points are related to health risk assessment studies (3), verification of desiltation of ash by UPRVUNL plants (1), cost-benefit analysis of compliance / non-compliance by TPPs (1)

8. NCL informed that it operates 10 opencast mines across U.P. and M.P. over 312 sq km area, all of which are adjacent to each other. Further, the feasibility study on utilising fly ash in the Nigahi operational mine of NCL by CIMFR, Dhanbad is underway. Physical and mechanical properties of pond ash (NTPC Vindhyanchal and Shaktinagar) and OB (Nigahi mine) were determined. Study in respect of mixing of ash with OB experimental dump and its affect on production due to ash disposal in running mines, overburden management are in

progress. Experimental dump will be filled in five phases with pond ash-OB mixture randomly in the ratio of 1:3. Report will be submitted in December, 2023.

9. Pollution control measures such as 44 fixed fog cannons, 20 tyre mounted cannons, 14 road sweeping machines and 173 mobile water sprinklers have been deployed in all NCL mines.

10. Hindalco industries requested for allocation of abandoned Makra stone pit, Obra aggregate stone quarry, Obra road pit no. 2 & 3 and Dalla stone quarry for backfilling of ash. Further, MPPCB was requested to grant the consent to use red mud to neutralize acidic water of Gorbi coal mine of NTPC.

11. It was informed that Hon'ble NGT (PB) O.A. 862/2022 order dated 25.11.2022 in the matter of Pankaj Kumar Mishra Vs Union of India & Ors. regarding control of air pollution caused by transportation of fly ash by TPPs located in Sonbhadra and Singrauli region and unregulated coal mining & stone crushers activities, constituted a Joint Committee comprising MoEF&CC, CPCB & SPCB and directed to furnish factual report within 3 months. The Committee inspected coal mines and TPPs during Feb., 2023 and filed Action Taken Report dated 21.04.2023 before NGT. Hon'ble NGT on 10.5.2023 directed to forward a copy of report dated 21.04.2023 to MoEF&CC for further action against violations reported & furnish the report. Following are the recommendations of Joint Committee as per Report dated 21.04.2023: -

- i. Truck/tippers cover of heavy duty such as 400GSM & more thickness and adequate in size to avoid fall of coal & ash on road during transport.
- ii. Night vision Pan-tilt-zoom CCTVs & lights at prominent locations along the roads used for transportation of coal & ash may jointly be established by Coal mines, TPPs and District Administration.
- iii. Device a mechanism to impose penalty on violation by the truckers/transporters.
- iv. Formulate a traffic management plan with emphasis on road safety on the prominent routes of coal & ash transportation.
- v. Vehicle engaged in transportation of fly ash & coal to have valid Pollution Under Check (PUC) certificate and a periodic check.
- vi. Engage mechanically designed vehicles to transport the wet ash.
- vii. Effective implementation of CPCB guideline on "disposal/utilization of Fly ash for reclamation of low-lying areas and in stowing of abandoned mines/quarries.
- viii. Nagar Nigam shall deploy mechanized road sweeping machines.

- ix. Short and long-term plan to create alternate/ separate roads for the coal/ fly ash transportation and for the commuting of the general public.
 - x. Construction of NH 39 should be completed at the earliest.
12. The following **recommendations were made during the meeting**:
- i. Effective implementation of the provisions of Ash Utilization Notification, 2021 for mandatory 100% utilisation of ash by TPPs must be ensured. Status in this regard may be presented in the next Mission meeting.

(Action: Ministry of Power and CEA)
 - ii. Details regarding total volume of mine voids and quantum of ash that can be utilised and quantum of ash that has been utilised so far in mine void filling and mixing of ash in OB dumps along with the list of mines approaching for closure of in 3-5 years may be shared.

(Action: Ministry of Coal and Ministry of Mines)
 - iii. Stipulation of specific provisions in Mine Closure Plan for enabling activities of backfilling of ash in available/ remaining mine void and mixing it with OB dumps.

(Action: Ministry of Mines and Ministry of Coal)
 - iv. Completion of feasibility study to assess the area/volume available for ash backfilling and mixing of ash in with OB of NCL mines at Nigahi operational mine by CIMFR within given timeframe. Findings of feasibility study of Nigahi operational mine to be presented during the next meeting of the Mission.

(Action: Ministry of Coal and NCL)
 - v. NCL to make a presentation in the next meeting of the Mission regarding action plan and status of mine closure in terms of reclamation and restoration of biodiversity for the abandoned mines.

(Action: NCL)
 - vi. Geo-tagging of Thermal Power Plants and Geo-tagging of mine voids may be undertaken

(Action: Ministry of Power and Ministry of Coal)
 - vii. As recommended in the 4th meeting of the Mission, Standard Operating Procedures (SOPs) are to be prepared before the next meeting for the following:
 - a. SOP for allocation of mines in respect of safety and administrative related matters (both UG/OC, working as well as abandoned)

- b. SOP for signing of MoU between identified mines and TPPs
- c. SOP for carrying out feasibility studies for identification of mine voids or OB dumps mixing of ash with OB in operational mines.
- d. SOP for carrying of scientific studies for backfilling of ash in mine voids of working U/G and Opencast mines.

(Action: Ministry of Coal and Ministry of Mines)

- viii. M/o of Railways and Railway Board to be communicated for taking necessary air pollution control measures in respect of ECR (Mahadia) and WCR (Gajra Bahara, Gondawali and Bargawa) in Singrauli region of MP. Railway Board may be included as member of the Mission.

(Action: MoEF&CC)

- ix. Request of Hindalco TPP regarding allocation of abandoned stone quarry in Dala region may be forwarded to State Government and Committee for identification of mines under Ash Utilisation Notification, 2021.

(Action: MoEF&CC)

- x. CEPI score estimated by MPPCB and UPPCB in the Singrauli and Sonbhadra regions may be re-validated by CPCB.

(Action: CPCB)

- xi. An advisory may be issued to all SPCB/PCCs to circulate the latest technologies for adoption by Stone crushers for improved air pollution control measures.

(Action: CPCB)

- xii. Road map for value added products such as use of bottom ash/ fly ash as a substitute for sand, bottom ash use in concrete making in coastal infrastructure projects to be prepared in consultation with NTPC, National Test House and other stakeholders.

(Action: CPCB)

- xiii. Best available technologies/practices for ash based products to be prepared and made available on MoEFCC and CPCB website.

(Action: CPCB)

- xiv. Environmental compensation imposed on TPPs, coal mine, stone crushers in Singrauli and Sonbhadra to be monitored and action to be taken against non-compliance. Status in this regard may be shared in the next meeting.

(Action: CPCB, UPPCB and MPPCB)

- xv. Recommendations of Joint Committee as mentioned in the directions of Hon'ble NGT(PB) O.A. 862/2022 vide Order dated 25.11.2022 to be shared with MPPCB and UPPCB for submitting the details of action taken report regarding its compliance and implementation. All respective industries, TPPs, mines/ stone crushers and railway sidings to ensure the compliance of the recommendation of Joint Committee and submit the compliance report to respective SPCBs.

(Action: CPCB, SPCBs and respective Industries/ stakeholders)

- xvi. Abandoned mines which are not needed by TPPs and those completed backfilling activities may prepare plans for reclamation and restoration of biodiversity as part of mine closure plan and compliance of environmental clearance. Reclamation activities may be carried out under the supervision of State Forest Department.

(Action: Dept. of Mines and Forest Dept., Govt. of MP and UP)

- xvii. Ambient air quality monitoring in and around thermal power plants, coal mines and stone crushers may be conducted and base line data set of the same seasons collected over the past two years may be analysed. Continuous evaluation of CEPI Score of Singrauli and Sonbhadara region and compilation of data may be carried out to assess the progress made in respect of control of air pollution.

(Action: State Govts. of U.P. and M.P., UPPCB and MPPCB, CPCB)

- xviii. Study on mixing of red mud with ash and its environmental aspects may be conducted and the results may be shared with CPCB.

(Action: State Govt. of M.P., MPPCB)

- xix. Necessary directions shall be issued for covering the trucks with tarpaulin sheets for transportation of coal and ash by road and not to use thin LDPE sheets/ green net only to prevent spillage and fugitive emission of coal dust and fly ash during transportation.

(Action: UPPCB and MPPCB)

- xx. Identification of available low lying areas for disposal of ash by TPPs and monitoring of specific conditions stipulated in the consent granted for dumping of ash in it. Utilization of ash for filling allotted sites of low lying areas must be monitored through geo-tagging and/or Video monitoring. Ash disposed in low lying areas to be stabilized with soil cover and grass/ green belt.

(Action: All TPPs, UPPCB and MPPCB)

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- xxi. Commencement of backfilling of ash in mine void of allotted Gorbi pit no. 3 by Anpara TPS by December, 2023. Progress in this regard may be shared with the concerned SPCB and CPCB.

(Action: Anpara TPP, UPRVUNL, UPPCB)

- xxii. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd, 3rd and 4th meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

Annexure**List of Participants**

1. Smt. Leena Nandan, Secretary, EF&CC- Chairperson
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Sh. Anandji Prasad, Advisor (Project), MoC
5. Sh. Piyush Singh, Joint Secretary (TD), MoP
6. Shri Tirupathi Reddy Kommidi, Additional Chief Manager, MoC
7. Shri N.K. Janoo, CCF, Forest Dept., Govt. of U.P., Meerut
8. Shri Swatantra Kumar Srivastava, Divisional Forest Officer, Forest Dept., GoU.P., Renukoot
9. Shri Chandra Mohan Thakur, MS, MPPCB
10. Shri Ajay K. Sharma, MS, UPPCB
11. Shri Ashutosh Kumar Dubey, ADM, Sonbhadra, U.P.
12. Shri Nazimuddin, Scientist F, CPCB
13. Shri N. Subrahmanyam, Scientist D, MoEFCC
14. Shri Mohammed Niyazi, Dir. (S&T), DGMS
15. Shri Kamal Kumar Jangid , Director, CEA
16. Shri P.S. Mohan Kumar, Deputy Director, CEA
17. Shri Tarun Kumar, Deputy Director, CEA, MoP
18. Shri Ranjeet Nirmal, District Mining Officer (GB Nagar), Directorate of Geology and Mining, GoUP.
19. Shri Rajendra Singh, AE, CD-3, PWD, Ghaziabad
20. Shri Mukesh Srivastava, RO, MPPCB, Singrauli
21. Shri R.K. Gupta, Superintending Engineer, MPPCB
22. Shri Gaurav Gahlot, Scientist C, CPCB
23. Shri Ramesh Babu, Director (Operations), NTPC
24. Shri S.K. Takhele, CGM (SSEA), NTPC
25. Shri G., Rajashekar, GM (AMG), NTPC
26. Shri Ashwani Tyagi, DGM, NTPC
27. Shri A.K. Samaiyar, ED, NTPC
28. Shri M.M. Mishra, Advisor, NCL, Singrauli
29. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
30. Shri Dinkar Tiwari, DM, NCL

31. Shri Sunil Prasad Singh, DT (NCL), CIL
32. Shri S.K. Dutta, Director (Technology), UPRVUNL
33. Shri Anand Kumar, Chief Engineer, UPRVUNL
34. Shri Ravikant Raut, Chief Chemist, MPPGCL
35. Smt. Rehana Beg, Resident Engineer, MPPGCL
36. Shri Ravikant Raut, Chief Chemist, MPPGCL
37. Shri Himanshu Verma, Sr. Manager, Lanco Anpara Power Ltd.
38. Shri Harshal Ambulkar, Vice-President, Grasim Industries Ltd.
39. Shri L.K. Dutta, Vice-President, Grasim Industries Ltd.
40. Dr. Vinay Kumar Yadav, AGM (Environment), Grasim Industries Ltd., Renukoot
41. Dr. Vinod K. Verma, Head Regulatory Affairs, Hindalco Industries
42. Smt. Vaishali Surawar, Hindalco Industries
43. Shri Sayed M Islam, Sr. Manager, Birla Carbon Industries Pvt. Ltd.
44. Shri Abhishek Singh, Manager, Greater Noida Authority
45. Shri Rajeev Sharma, AE, MPIDC, Bhopal
46. Dr. Sujit Kumar Mandal, Chief Scientist, CSIR-CIMFR, Dhanbad
47. Shri Prashant, CSIR-CIMFR, Dhanbad
48. Shri Durgananda Jha, SRF, CPCB
49. Shri Avneesh Kumar Chauhan
50. Shri Vinay Ramaiya
51. Shri Mukesh Mittal

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F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003
Date: 9th April, 2024

OFFICE MEMORANDUM

Sub.: Minutes of the sixth meeting of 'Fly Ash Management and Utilization Mission' held on 31.01.2024 - reg.

The undersigned is directed to refer the sixth meeting of 'Fly Ash Management and Utilization Mission' held on 31.01.2024 at 12:00 PM at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 19.10.2023.

2. In view of the above, minutes of the sixth meeting of 'Fly Ash Management and Utilization Mission' is enclosed herewith.
3. It is requested to kindly furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated

Yours sincerely,


(Dr. Satyendra Kumar)

Director

Ph: 011-20819291

Email: satyendra.kumar07@nic.in

To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chairman, Ministry of Railways (Railway Board), New Delhi
5. Chief Secretary, State of Uttar Pradesh
6. Chief Secretary, State of Madhya Pradesh

7. Chairman, CPCB, New Delhi
8. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
11. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
12. Director General, Directorate General of Mines Safety, Jharkhand
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
14. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
15. Chairman, UPPCB, Uttar Pradesh
16. Chairman, MPPCB, Madhya Pradesh
17. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
18. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
19. CMD, M/s NCL
20. CMD, M/s NTPC Limited
21. CMD, M/s Lanco Anpara Power Pvt. Ltd.
22. CMD, M/s Hindalco Industries Ltd.
23. CMD, M/s UPRVUNL
24. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
25. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
26. CMD, M/s Sasan Power Limited, Singrauli
27. CMD, M/s APMDC Ltd., Singrauli
28. Industries, Mines and Stone crushers concerned in Singrauli and Sonbhadra Region.

Copy to:-

1. PSO to Secretary (EF&CC)
2. PPS to AS(NPG)
3. Guard File

Minutes of the 6th meeting of Fly Ash Management and Utilization Mission held on 31.01.2024 at 12:00 PM

The sixth meeting of 'Fly Ash Management and Utilization Mission' was convened on 31st January, 2024 at 12:00 PM to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 19.10.2023. The list of participants is enclosed as Annexure.

2. At the outset, Secretary welcomed all the participants. Addl. Secretary, MoEF&CC briefed about the decisions made by the Mission in last meeting held on 19.10.2023.

3. A presentation was made by the Madhya Pradesh Pollution Control Board on progress of implementation of action plans and recommendations of Joint Committee in regard to control of air pollution due to transportation. The following details were presented:

- i. 05 Thermal Power Plants of capacity 12140 MW generated 158.08 LMT ash in Singrauli, Madhya Pradesh in FY 2022-23. Status of implementation of action plan for fly ash utilisation in the region were presented:

TPP name	Year 2021-22		Year 2022-23		Year 2023-24 (till Dec.)	
	Generatio n of ash (L MT)	Utilisatio n (%)	Generatio n of ash (L MT)	Utilisatio n (%)	Generatio n of ash (L MT)	Utilisatio n (%)
NTPC Vindhyach al Singrauli	82.38	53.05%	76.64	37.31%	51.18	56.66%
Sasan Power Limited	53.47	52.35%	45.99	109.5%	36.37	98.70%
Mahan Energen Limited	8.36	25.46%	9.08	100.2%	10.68	102.36%
Jaypee Nigrie Super TPP	15.79	89.55%	14.55	100.09%	13.83	75.38%

Vill. Nigrie, Singrauli						
Hindalco Industries Ltd, Mahan Aluminium, Singrauli	11.54	85.55%	11.82	79.4%	8.31	135.74%
Total	171.54 LMT	56.96%	158.08 LMT	70%	120.36 LMT	81 %

ii. Status of ash utilisation by 15 TPPs in Madhya Pradesh including TPPs in Singrauli:

Year	Ash generation (LMT)	Ash utilisation (LMT)	Utilisation (%)
FY 2021-22	285.12	176.99	62.07%
FY 2022-23	303.06	223.8	73.84%
FY 2023-24 (till Dec.)	204.4	172.53	87.41%

- iii. Out of 120.36 LMT ash utilisation by 05 TPPs in Singrauli in FY 2023-24 (till Dec.), 49.1 LMT (50%) ash was utilised for ash dyke raising and other activities, 19.07 LMT (19.5%) ash supplied to cement industries and 16.4 LMT (16.84%) ash utilised in road construction projects.
- iv. Out of 204.4 LMT ash generation by 15 TPPs in Singrauli region in FY 2023-24 (till Dec.), 25.94 LMT ash utilized for backfilling in Gorbi pit and low lying areas, 46.34 LMT supplied to roads & other construction projects and 49.47 LMT supplied to cement industries.
- v. 03 TPPs in M.P. have utilised less than 80% ash generated by them namely, NTPC Vindhyanchal (56.6%), Sanjay Gandhi TPS, Umaria (62.7%), Jaypee Nigrie STPP (75.3%) in FY 2023-24 (till Dec.).
- vi. NTPC Vindhyanchal is expected to utilise approximately 70 LMT (70%) available ash in road construction projects by March 2023. It was informed that a coordination Committee has been constituted under Director, NTPC to review the MoUs signed between TPPs and ash users for allocation of ash to road construction and other

related projects. CO₂ sequestration plant is also installed to capture 20 tonnes of CO₂ per day from the flue gas of the Power Plant to yield 10 tonnes/day of methanol through hydrogenation process.

- vii. Sanjay Gandhi TPS emphasized the challenges associated with the lifting of ash from the existing ash dyke (starter dyke only) with single lagoon. It was informed that the dyke was designed solely for ash disposal without any provision for lifting of ash and is surrounded by hilly terrain on three sides. MPPCB in this regard was requested to provide low-lying areas for disposal of current ash.
- viii. NCL operates 12 coal mines in Singrauli region, which produced 162 million tonnes of coal in FY 2022-23.
- ix. Action plans have been submitted by 05 Thermal Power Plants, 08 coal mines (NCL), 56 stone crushers and 08 railway sidings (03 ECR; 03 ECR; 02 NCL) for implementation of pollution control measures.
- x. The following activities form action plan of various industries in M.P. have been reported under progress:
 - a) M/s NTPC Vindhyanchal STPP, Singrauli (13 units)
 - FGD installation for SO₂ in 12 units by June, 2025
 - NOX emission control measures
 - % increase in fly ash utilisation
 - Renovation of ESP and installation of Mechanized cleaning system by March, 2024.
 - b) M/s Sasan Power Limited
 - FGD installation for SO₂ by Dec. 2026
 - Construction of pipeline for fly ash transportation by March 2024. Orders issued for procurement of equipment.
 - Sprinkling system in ash dyke
 - Submission of NEERI Report for breach of ash dyke
 - c) M/s Mahan Energen limited
 - FGD installation for SO₂ by Dec., 2026

- Development work of railway siding. Railway's approval is pending.
 - Transportation by Merry go round. Forest clearance is pending.
- d) M/s Hindalco Industries Ltd.: Installation of FGD installation for SO₂ in Unit-1,2,3,4,5 by Dec. 2026 and construction of RCC road by Aug. 2024.
- e) Jaypee Nigrie STPP: Installation of FGD installation for SO₂ by Dec., 2026 and % increase in fly ash utilisation.
- f) Northern Coalfields Ltd., Singrauli: Submission of report on study conducted by CIMFR on backfilling of fly ash in OB in Nigahi Mine by March, 2024.
- g) NCL, Nigahi: Construction of additional 10 MTPA Coal Handling Plant (CHP) and CC roads by March, 2024.
- h) NCL, Jayant Project: Arrangements for truck mounted mist spray and fog forming sprinklers and installation of Continuous Effluent Quality Monitoring System (CEQMS).
- i) NCL, Block-B Project: Construction of 4.5 MT CHP and other roads by June 2024.
- j) NCL, Dudhichua Project: Construction of roads and RCC bunds. Proposal for construction of new ETP (30 KLD) is dropped. Existing ETP needs to be upgraded.
- k) NCL, Bina ext.: Construction of 9.5 MTPA CHP, ETP upgradation and Installation of CEQMS by March 2024
- l) APMDC Ltd.-Sulyari Open Cast Project: Construction of CHP by March, 2025 and approach roads (5.2 km) under progress.
- m) Sasan Power Limited (Moher & Moher Amlohri extension coal mine):
- As utilisation in OB dumps
 - Procurement of mist cannons for dust suppression
 - Rehabilitation and resettlement of affected people
- n) Jaiprakash Power Ventures Ltd., Amelia (North) Coal Mine: Ash utilisation in OB dump will be done as per CIMFR study.
- o) THDC India Ltd., Amelia Coal Block (new mine)
- Ash utilisation as per CIMFR study
 - Construction of CHP by November 2024
 - 10 KLD ETP installation

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- Construction of railway sidings
- p) East Central Railway, Spur III & X
- Fixed water sprinklers
 - Green belt
 - Work as per CPCB Guidelines
- q) East Central Railway, Mahedaiya
- Fixed water sprinklers
 - Green belt
 - Work as per CPCB Guidelines
 - Wind breaking wall
 - Construction of approach road
- r) West Central Railway, Gajra Bhara and Bargawan showed no substantial progress w.r.t. the following activities:
- Dust Protection walls
 - Water sprinkling system or tankers
 - Drainage facility
 - A pucca circulating handling area
 - All weather approach Road
 - Green belt around coal siding area
- xi. NEERI was engaged to conduct a study on environmental damage caused due to fly ash breach in Sasan Mega Power Ltd. in year 2020. Environmental compensation of Rs. 75 crore was estimated. The report was further forwarded to IIT BHU for re-evaluation and is under review. The final report is yet to be submitted to MPPCB.
- xii. In order to complete the feasibility study at Nigahi operational mine, NCL requires 534 trips for ash transportation out of which 225 trips for fly ash have been completed so far. Due to the restrictions on fly ash transportation during the day, sufficient quantity could not be made available at the study area (10 trips as against 15 trips in a day).

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- xiii. NCL, Dudhichuwa proposed to install a new ETP of capacity 30 KLD, however it was mentioned that the existing ETP is adequate with few modifications. It was informed that the request regarding the modification of existing ETP has been submitted. An Oversight Committee comprising officials from CPCB and MPPCB inspected the treatment plant and observed that the ETP was operating below capacity and outdated. It was recommended to upgrade the ETP with advanced treatment technologies. Expert agencies in this regard have been approached for modification of existing ETP.
- xiv. It was informed that APMDC Ltd. (Sulyari Open Cast Project) in Singrauli region is permitted to transport coal exclusively by road for the next 5 years and required to establish the railway transportation system within this timeframe. APMDC Ltd. yet to initiate the construction work.
- xv. Action plans have been submitted by 56 stone crushers. 48 stone crushers have installed Dust containment system, 41 installed wind breaking wall, 48 have arrangements for regular cleaning and wetting. 08 stones crushers are closed by Collector, Singrauli.
- xvi. MPPCB has issued following directions in compliance to recommendations of Joint Committee to control of pollution caused by ash transportation in accordance with Hon'ble NGT(PB) O.A. 862/2022 order dated 25.11.2022:
 - a. TPP/Coal mines vide letter dated 14.12.2023 were directed to use heavy duty cover such as 400 GSM & more thickness of adequate size by trucks/tippers transporting coal/fly ash.
 - b. TPP/Coal mines/ District administration/ Nagar Nigam Singrauli vide letter dated 14.12.2023 were directed to install PTZ CCTVs, lights and control rooms, impose penalty on transporters on violation, prepare traffic management plan, PUC certificate for vehicle used for transportation of ash and coal.
 - c. TPP/Coal mines/ District administration/ Nagar Nigam Singrauli vide letter dated 14.12.2023 were directed to procure mechanically designed vehicle for wet transportation of ash, follow CPCB guidelines for disposal of fly ash, deploy road sweeping machine.
 - d. District Collector was requested to prepare action plan for roads for transportation of coal/ fly ash on 14.12.2023.
 - e. NHAI to complete the pending work of NH-39. Work is under progress.

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xvii. The Oversight Committee comprising officials of CPCB, MPPCB and District Magistrate, Singrauli inspected thermal power plants, coal mines and railway sidings for verification of compliances of directions given by Hon'ble NGT vide its order dated 18.02.2022 in the August 2023 and January 2024 and submitted the report for 3rd and 4th quarter, respectively. Recommendations are as below:

- a) The Committee has imposed environmental compensation on various TPPs, coal mines and railway sidings for non-compliances. Hon'ble Supreme Court has referred the case to the Hon'ble NGT for re-consideration.
- b) West Central Railway and East Central Railway to comply non-compliances reported by Oversight Committee and SPCB and obtain CTO.
- c) NCL Jayant to ensure proper maintenance of O&G trap and coal siding spur-I & II.
- d) NCL Dudhichua to expedite work of RCC bund, stop effluent discharge to Balia nalla and review technical feasibility of ETP design.
- e) NCL Nigahi to ensure that no overburden and effluent shall meet Mundwani dam.
- f) M/s Sasan TPP to review technical design and feasibility of overflow lagoon and submit environmental damage assessment report prepared by NEERI and ensure cleaning of ash from where drain meets to river.
- g) M/s Trimula Industries Ltd. to ensure effective operation of air pollution control devices, conveyor belt and OCEMS, cleaning of iron fines and road cleaning.

4. A presentation was made by Uttar Pradesh Pollution Control Board on progress of implementation of action plans and recommendations of Joint Committee in regard to control of air pollution due to transportation. The following details were presented:

- i. 06 TPPs in Sonbhadra namely, M/s UPRVUNL, Anpara TPS, M/s UPRVUNL, Opra TPS, M/s NTPC Shaktinagar TPS, M/s NTPC Rihand Nagar, M/s Hindalco Industries Ltd. (Renusagar) and M/s Lanco Anpara Power Ltd have submitted 5-year action plan for 100% utilisation of ash.
- ii. 06 TPPs of capacity 10670 MW produced 56.8 LMT ash in FY 2022-23. Status of fly ash utilization by 06 TPPs in Sonbhadra, U.P. were reported as below:

Financial Year	Total quantity of ash generated (LMT)	Total quantity of ash utilised (LMT)	% ash utilisation
2021-22	151.1	57.9	38.3%

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2022-23	161.9	56.8	35.08%
2023-24 (till Dec)	121.1	67.4	55.6%

- iii. 05 TPPs in Sonbhadra region have low ash utilisation level namely, Lanco Anpara (15.8%), Anpara, UPRVUNL (40.55%), NTPC Shaktinagar (42.4%), Rihandnagar (70.02%) and Obra (78.3%).
- iv. Out of 121.1 LMT ash generation in FY 2023-24 (till Dec.), 34.68 LMT was utilised in construction of roads and highways, 25.2 LMT was filled in low lying areas, 10.42 LMT ash supplied to cement industries and 10.2 LMT supplied to brick manufacturers.
- v. Sonbhadra regions have 05 NCL coal mines and had produced total 49 MTPA coal in FY 2022-23.
- vi. Action plans have been submitted by 06 TPPs, 03 industries, 05 coal mines (NCL), and 313 stone crushers for implementation of air pollution control measures. The following activities form action plan of various industries in U.P. have been reported under progress:
 - a) M/s NTPC Shaktinagar: FGD installation (by Dec, 2026) and expansion of Ash Water Recirculation System (AWRS) capacity.
 - b) M/s NTPC Rihandnagar: Installation of FGD, Dry Ash Extraction System (DAES) in stage I & II and cold fog dust is in progress.
 - c) M/s UPRVUNL (Anpara A, B & D TPS)
 - ESP installation
 - FGD installation at A, B & D TPS
 - Construction of Bio-methanation plant
 - d) M/s Lanco Anpara and M/s Hindalco Industries (Power Division), Renusagar yet to install FGD.
 - e) M/s UPRVUNL (Obra): FGD installation and removal of old deposited ash in progress.
 - f) NCL, Bina Project
 - Construction of new 9.5 MTPA CHP by March, 2024
 - Plantation along Auri-Shaktinagar highway

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- ETP & STP upgradation
 - Installation of 01 additional Continuous Ambient Air Quality Monitoring Stations (CAAQMS)
- g) NCL, Dudhichuwa Project
- Construction of new 10 MTPA CHP by March, 2024
 - 02 RCC bunds to prevent discharge to balia nala
 - Construction of Siltation pond
 - Tyre washing system/mechanism of Coal transporting vehicles
- h) NCL, Kakri Project: Plantation along roadside and tyre washing system/mechanism of Coal transporting vehicles on road.
- i) NCL, Khadia Project
- ETP upgradation
 - Tyre washing system/mechanism of Coal transporting vehicles
 - Construction of railway sidings
- j) NCL, Krishnashila Project: Construction of sedimentation pond and green belt.
- k) Aluminium Smelter: Hindalco Industries
- Equipment for wastes generated
 - Completion of study on mixing of red mud with fly ash
 - Submission of report on feasibility study awarded to IIFM Bhopal
- l) M/s Grasim Industries and M/s Birla Carbon have initiated Miyawaki plantation outside the plant premises.
- m) Out of 313 stone crushers, 35 stone crushers have yet to install air pollution control system. Show cause notices were issued to 18 stone crusher units and closure directions to 17 Nos. of stone crusher under Air Act for non-compliance.
- vii. Status of coal transportation by NCL via different modes in FY 2023-24 (till Dec) was presented as below:

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S. No.	NCL projects	Mode of coal transportation %		
		Rail	Road	Ropeway
1.	NCL Dudhichua	84.4	15.6	-
2.	NCL Bina	71.2	28.73	-
3.	NCL Khadia	75.2	24.8	-
4.	NCI Krishnashila	50.51	14.9	34.5
5.	NCI Kakri	50.4	49.5	-

- viii. Coal mines in Sonbhadra region have adopted air pollution control measures such as use of tarpaulin covered trucks, installed CCTV cameras, covered conveyer belt, water sprinkling system, truck-mounted mist gun and mobile water sprinkling tankers.
- ix. MoU was signed on 15.07.2023 by NCL and Anpara for backfilling of ash in Gorbi Pit no. 3. Consent granted by NCL for ash filling. 13 Million cubic meters of void (filled with acidic water) will be made available by NCL. Regulatory permissions are being sought by UPRVUNL. Ash filling is yet to be started.
- x. Lanco Anpara has placed orders for 5 lakh tonnes, 3 MoUs and tenders are in pipeline. It was informed that 60% ash utilisation will be achieved by March, 2024.
- xi. Lanco Anpara has received request from UPEDA on 19th January, 2024 for supply of ash for road construction project for which signing of MoU is in final stage.
- xii. Obra TPS has stabilized and reclaimed legacy ash through plantation/ green cover. Additionally, an ash dyke has been constructed for disposal of ash.
- xiii. M/s UPRVUNL, Obra TPP has completely desilted 58000 CuM deposited ash from Renu/ Rihand river and was disposed in low lying area in Obra Sector 2 & 3. Soil stabilization has been completed and Miyawaki afforestation has been initiated.
- xiv. M/s Anpara TPP has removed 206540.9 CuM visible ash from Rihand reservoir so far and disposed off in low lying area. Soil stabilization is completed and plantation is under progress.
- xv. Consent-to-Operate granted to 11 units for disposal of ash in low-lying areas. 3856784.05 MT ash have been disposed so far.
- xvi. In the year 2023-24 (till January), 19 Million Tonnes of coal (17% of total coal production). 02 CHP are under construction and expected to be commissioned by next

year, which will enhance the rail transportation to 118 MTPA from the present 85 MTPA. Ministry of Coal has targeted to achieve mechanization and coal transportation by rail to 95% by year 2026-27.

- xvii. It was discussed that coal mines have sought amendments in Environmental Clearance for transporting coal by road for the period beyond year 2026-27.
- xviii. Central Laboratory, Bhopal to complete the study on mixing of red mud with fly ash in Gorbi mine. Hindalco Industries requested Indian Institute of Forest Management, Bhopal regarding feasibility study. Red mud pilot study may be taken up separately by MPPCB as it may lead to the leaching of heavy metals embedded in the red mud besides treating the acidic water of mine voids.
- xix. UPPCB has forwarded the list of available abandoned mines in Sonbhadra (06 mines) and Jhansi (04 mines) shared by Director, Geology and Mining Department, Govt. of U.P. to Thermal Power Plants on 16.10.2023, for backfilling activities.
- xx. CPCB estimated the combined CEPI score of 62.59 for Sonbhadra and Singrauli region in Dec. 2017 and March 2018. Further, CPCB evaluated CEPI Score for Sonbhadra region in May 2022 and was 67.88. Subsequently, UPPCB conducted re-assessment of CEPI score in August, 2023 and is at 49.2. Further, MPPCB assessed the CEPI score in August, 2023 for Singrauli region which is at 45.17. CPCB will assess CEPI score for Sonbhadra and Singrauli region in April, 2024.
- xxi. Air pollution control measure such as storage of ash under covered shed, ash transportation by closed tankers, silos for dry ash storage, facility for washing of wheels of transportation trucks, keeping pond ash in moist condition (about 15%) for transportation and loading of ash on trucks/bulkers through telescopic chutes have been undertaken by Thermal Power Plants.
- xxii. To control fugitive dust emission, measures such as transportation of coal in tarpaulin covered trucks, installation of CCTV cameras, covered conveyer belt, water sprinkling system, arrangements for truck-mounted mist gun and mobile water sprinkler tankers have been adopted by coal mines in Sonbhadra region.
- xxiii. In Sonbhadra region, ambient air quality was analysed to assess the impact of implementation measures by various TPPs. PM10 level has improved to 146.3 $\mu\text{g}/\text{m}^3$ in 2023-24 (till Dec.) from 167.3 $\mu\text{g}/\text{m}^3$ in 2022-23. AQI improved to 135 in 2023-24 (till Dec.) as compared to 141 in 2022-23.
- xxiv. NEERI has conducted field visit on 27.12.2023 to determine carrying capacity of Stone crusher area Dala, Billi and Obra region. Report is awaited.

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- xxv. Environmental compensation of Rs. 13.473 cr. were imposed on 8 TPPs (Lanco Anpara, NTPC Rihandnagar, Shaktinagar, Anpara TPs, Obra TPS, Hindalco Ind. Aluminium re-processing unit, Hindalco-Al Division and Birla Carbon). Rs. 0.516 cr. have been deposited by 04 TPPs. Closure directions issued to 17 stone crushers out of 313 stone crushers.
- xxvi. Environmental compensation of Rs. 9.954 crores imposed on 05 NCL projects (Bina, Duddhichua, Kakri, Khadia, Krishnshila). Amount is yet to be deposited. NCL Bina project deposited Rs. 2 crores for illegal dumping of coal at railway siding at Krishnshila as per Supreme Court and NGT directions.
- xxvii. UPPCB vide letter dated 18.10.2023, 13.12.2023 & 09.1.2024 has issued directions in compliance to recommendations of Joint Committee to control of pollution caused by ash transportation in accordance with Hon'ble NGT(PB) O.A. 862/2022 order dated 25.11.2022. Status was presented as below:
- a) 20% moisture content of ash is being maintained for transportation
 - b) Tyre cleaning mechanism before ash transportation is under construction.
 - c) Air pollution control measures such as transportation of ash through bunkers/ tarpaulin covered trucks, installation of water sprinkling system, development of green belt at ash dykes and water sprinkling on roads is undertaken by all TPPs. Submission of ash dyke report annually by TPPs.
 - d) TPPs have installed PTZ camera at exit of the ash transportation point.
 - e) NCL Coal mines have installed truck mounted fog cannons machines, fixed fog cannon, tyre washing mechanism (in 1 out of 4 coal mines), mechanical road sweeping machines, fixed water sprinkling mechanism, road sweeping machines and water sprinkling activities on mine road.
- xxviii. A workshop to promote ash utilisation in manufacturing of fly ash bricks and other was held on 7.10.2023 with fly ash brick manufacturing units, thermal power plants, officials of district administrative, and representatives from the State Pollution Control Board (SPCB), at UPRVUNL Obra, Sonbhadra.
5. A presentation was made by Ministry of Power/ CEA on status of implementation of the provisions of Ash Utilization Notification, 2021 to achieve 100% ash utilisation by TPPs

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- i. A joint meeting under the chairmanship of Member (Thermal), CEA with the officials of CPCB and NTPC was held on 2.01.2024 regarding to review the implementation of provisions of Ash Utilisation Notification, 2021 and recommended the following:
 - a) CPCB to engage professional IT solutions agency to modify the portal w.r.t. essentials like current and legacy ash targets and their present utilisation.
 - b) All SPCBs (enforcement agencies under the Notification) to be requested to direct all TPPs within their respective jurisdictions, to upload the ash ponds coordinates for development of GIS layer for geo-tagging of TPPs. MoM/MoC may be requested for sharing mine coordinates for geo-tagging of mine voids.
 - ii. With respect to geo-tagging of TPPs, 50 TPPs have uploaded ash ponds coordinates as on date. TPPs have reported constraints in retrieving coordinates after uploading on CPCB's coal ash portal. CPCB has been provided with regular updates on this issue.
 - iii. Guidelines for procedure for annual certification of the ash pond or dyke has been published by CEA and CPCB on 30th June, 2023 and is available at CPCB and CEA's websites.
 - iv. CEA has forwarded the list of 505 TPPs (194 grid connected plants and 311 captive power plants) to CPCB for their updation and registration on Coal Ash Portal.
 - v. A meeting was convened with NHA and NTPC to resolve the issues related to supply of ash by TPPs for road construction projects.
6. A presentation was made by Ministry of Coal on finalisation of SOPs for backfilling of ash in mine voids and mixing of ash in overburden dumps by Thermal Power Plants:
- i. SOPs have been drafted and submitted to the Committee chaired by Additional Secretary (Coal) for approval. Draft SOPs have been circulated to the concerned stakeholders and will be finalised within one month.
 - ii. CIL allocates its mine voids in accordance with the 'Guidelines of CIL offering mine out voids for fly ash disposal' as approved on 15.04.2020. No ash backfilling activities are currently being undertaken in the open-cast and underground mines of SCCL. SECL has prepared SOP for signing of MOU between identified mines and TPPs in line with CIL guidelines.
 - iii. It was informed that 60 L CuM out of 1788 L CuM voids of allotted mines have been filled with ash, so far. Steps to identify mines closing in next 3-5 years have been

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finalized and will present before the Committee constituted under the Chairmanship of Additional Secretary (Coal). Thermal power plants were requested to identify mines in close proximity to their locations.

- iv. M/o Coal has identified various underground mines voids for filling bottom ash. The list will be circulated to concerned stakeholders.
 - v. The Central Level Working Group on 21.09.2023 allocated the following mines to TPPs-
 - a) CIL–MCL Jagannath OCP (Quarry-VII) allocated to Jindal India Thermal Power Limited
 - b) CIL –CCL Dakra- Bukbukamine allocated to Hindalco Industries Ltd.
 - c) CIL –CCL New Selected Dhori UG mine allocated to DVC (CTPS)
 - d) Krishnashila, NCL allocated to NTPC-Singrauli
 - e) CIL –NCL Gorbi Pit 1 & 2 allocated to NTPC (Singrauli TPS also)
 - ii. MPPGCL informed that the issue regarding allocation of Sarni UG of WCL to Satpura TPS was discussed in the 4th meeting of Central Level Working group on 21.09.2023. The allocation request is still pending with WCL for approval. WCL is also not in agreement with the MoU.
7. NCL presented the status on feasibility study conducted at Nigahi mine and action plan and status of mine closure in terms of reclamation and restoration of biodiversity for the abandoned mines:
- i. CIMFR to complete the feasibility study conducted at Nigahi operational mine by March 2024. The study aims to identify the factors based on which the mixing of percentage of fly ash with overburden will be determined.
 - ii. Central Level working group allocated abandoned pits of Gorbi mine to the following TPPs:

Gorbi Mine void	Area of pit (Ha)	Quantity of ash that can be accommodated (Million tonne)	Allotted to Power plant	Quantity of ash filled
Pit 1	40	25	NTPC Vindhyanchal	1.853 Million tonne

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			NTPC Singrauli	MoU in process
Pit 2	8	7.5	NTPC Vindhyanchal	MoU in process
			NTPC Singrauli	MoU in process
Pit 3	26	16.25	UPRUVNL- Anapra TPS	Mou signed on 15.7.2023. Ash filling yet to be started.

- iii. The post-mine closure plan, inter alia, encompasses the biological reclamation of the three Gorbi Pit-1, Pit-2, & Pit-3 (74 ha) after filling it with ash up to ground level.
- iv. Final mine closure plan envisages activities such as ambient air quality and water quality monitoring (during and post backfilling), dismantling of infrastructure, construction of concrete wall with masonry pillars around backfilled pits (Length: 17,000 m), garland drain, sign boards, sprinkling system, vegetation of external OB dump degraded slope over 29.4 ha, landscaping and plantation over 164.4 ha, mine void completely filled with fly ash (devoid of water body), achieve convex shaped area by covering it with soil layer to avoid water accumulation after backfilling.
- v. It was informed that in line with Ministry of Coal's Policy Guidelines for use of land acquired under Coal Bearing Areas (Acquisition & Development) Act, 1957, NCL has imposed lease rent (approximately Rs. 1 crore per annum) on the land area to be used for development of infrastructure required for backfilling activities which is causing delay in finalising the MoUs.
- vi. Anpara TPS, UPRUVNL has sought permission from District Administration in Singrauli, M.P. regarding transportation of fly ash by road to the allotted Pit-3 of Gorbi mine for backfilling activities.
8. CPCB presented the status of actions taken on various decisions of the Mission:
- i. Status of actions taken on decisions of 1st, 2nd, 3rd and 4th meetings of the Mission obtained from the stakeholders are as follows:

Meeting	No. of Decisions	Compiled	Regular activities	Time-bound / Yet to comply*
1 st	11	7	3	1

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2 nd	18	12	3	3
3 rd	23	12	4	7
4 th	21	8	8	5

* 08 decisions are time bound/ yet to comply and are related to health risk assessment studies, feasibility study for OB, pilot study for red mud, desiltation, reclamation and stabilization of ash by UPRVUNL plants and its verification, review of EC condition of non-coal mines, cost-benefit analysis of compliance / non-compliance by TPPs, GIS mapping of coal mine pits, SOP for non-coal mines, real-time data of availability of ash across all thermal power plants across the country, assessment of legacy ash in respect of all power plants across the country, online clearance for use of ash in low lying areas for approved projects only and making the compliance and reporting of all provisions relating to Ash Utilisation Notification online for all coal/lignite based thermal power plants across the country.

- ii. CPCB vide letter dated 27.12.2023 to MPPCB and UPPCB has sought details regarding monitoring/ assessment of CEPI score in and around TPPs, coal mines and stone crushers and status of compilation/ analysis of data done to assess the progress made in respect of control of air pollution.
- iii. CPCB has commenced the re-validation process of CEPI score assessed by MPPCB and UPPCB for Singrauli and Sonbhadra region, respectively in August 2023. Tender has been floated for re-validation, and will be made available by the end of February, 2024. The bid in this regard was uploaded on 29.01.2024, and will be finalized on 09.02.2023.
- iv. CPCB has published 'Environmental Guidelines for Stone Crushing Units' in July, 2023 to prevent fugitive dust emission and uploaded on CPCB's website. The guidelines were circulated to all the SPCBs/ PCCs.
- v. Jadavpur University has submitted the study proposal on value-added utilization of bottom ash generated from coal fired thermal power plants by developing innovative technologies for its use in concrete production as partial replacement of sand on 28.04.2023. CPCB conducted a meeting with JU on 8.11.2023 and also discussed the matter with the relevant department of NTPC. A short Proposal on testing bottom ash of 10 TPPs was submitted on 5.1.2024, and revised proposal on 16.1.2024. CPCB on 30.1.2024 recommended to provide financial assistance of Rs. 20 lakhs for the study. The study will be completed within nine months.

9. Chairman, Railway Board was requested to nominate an officer as a member of the Mission on 30.11.2023. MoEF&CC vide letter dated 17.01.2024 forwarded the recommendations of Mission w.r.t. air pollution control measures at ECR and WCR railway sidings.

10. Request of Hindalco TPP regarding allocation of abandoned stone quarry in Dala region was forwarded to PS, Dept. of Geology and Mining and Chairman, Committee for identification of mines on 21.12.2023.

11. Ministry of Mines vide letter dated 8.11.2023 has stated that Ministry of Labour & Employment may be requested to provide inputs regarding exemption from permission of DGMS for backfilling in mine voids and mixing of ash in OB dumps and preparation of SOP for carrying out feasibility studies in respect of all mines in view of safety issues in non-coal mines.

12. The following **recommendations were made during the meeting:**

- i. A streamlined procedure may be devised to enable potential users of ash in reaching out to Thermal Power Plants to acquire ash for various construction projects or other eco-friendly purposes. NTPC and thermal power plants to upload the availability of ash for utilisation by various agencies and prospective user agencies on the centralized portal on real time basis, to facilitate relevant stakeholders or ash users to reach out to the respective Thermal Power Plants (TPPs) for utilization in various eco-friendly purposes. A feature could be integrated in the portal allowing potential ash users to submit their applications to TPPs. Demand and supply module may be integrated into the portal.

(Action: Ministry of Power, NTPC and CPCB)

- ii. Carry out continuous evaluation of implementation of action plans by TPPs, industries, coal mines and stone crushers in Singrauli and Sonbhadra region. Compliance reports of TPPs that have effectively utilized ash above 80% in the past two years may be shared with other TPPs or Industries.

(Action: Ministry of Power, Ministry of Coal, UPPCB and MPPCB)

- iii. CIMFR to complete the feasibility study to assess the area/volume available for ash backfilling and mixing of ash in with overburden of NCL mines at Nigahi and Amelia (North) coal mines within given timeframe. Findings of feasibility study of Nigahi operational mine to be presented in the next meeting of the Mission.

(Action: Ministry of Coal, NCL & Jaiprakash Power Ventures Ltd.)

- iv. Allocation of Sarni UG mine voids of M/s WCL to Satpura TPS, M.P. Power Generation Company Ltd. for backfilling of ash may be made at the earliest.

(Action: Ministry of Coal & WCL)

- v. Neutralization of acidic mine water may be carried out, and subsequent reclamation may be undertaken through development of green cover/ plantations in abandoned mine voids to foster biodiversity restoration.

(Action: Ministry of Coal and NCL)

- vi. Ministry of Coal to review the policy/ guidelines regarding charging lease rent from TPPs for development of facilities/infrastructure required for the purpose of ash backfilling, water treatment and connected activities in the allocated mine voids/coal bearing areas.

(Action: Ministry of Coal)

- vii. A review to be undertaken with coal mines for early operationalisation of Coal Handling Plants and achieving maximum transportation of coal by rail as per the timelines prescribed by M/o Coal vis-à-vis timelines obtained through amendments of Environmental Clearances of coal mines.

(Action: Ministry of Coal, NCL, Coal Mines & Railway Board)

- viii. Draft SOPs prepared by M/o Coal for allocation of mines, signing of MoU and feasibility studies for mixing of ash with OB/backfilling of ash in o/c & u/g mines, to be shared with SPCBs and TPPs for their inputs for making it practical for implementation. A consultation meeting to be convened with all concerned stakeholders to finalize the draft SOPs. Following finalization of SOPs, the Ministry of Coal and the Ministry of Power may jointly organize a program to disseminate them to Thermal Power Plants (TPPs) and State Pollution Control Boards (SPCBs) and all other stakeholders. Additionally, the application process for allocation of mine voids to TPPs for backfilling activities may be streamlined by making the application as well as availability of mine voids online on the centralized portal. The progress to be presented in the next meeting.

(Action: Ministry of Coal and Ministry of Mines)

- ix. Details of specific air pollution control measures to be taken by Railway Board at railway sidings to be shared for communication to Railway board to by MoEFCC.

(Action: MPPCB, UPPCB and MoEF&CC)

- x. Secretary, Dept. of Power, UP to be communicated regarding the low status of status of utilisation of ash by UPRVUNL for reviewing situation to increase the utilisation levels in accordance with Ash Utilisation Notification, 2021.

(Action: MoEF&CC)

- xi. Re-validation of CEPI score of Singrauli (45.17) and Sonbhadra region (49.2) as estimated by MPPCB and UPPCB in August 2023 to be completed by April, 2024.

(Action: CPCB)

- xii. Assessment of CEPI score in Singrauli and Sonbhadra region is to be done twice in a year i.e. pre-monsoon (April-May) and post-monsoon season (December-February).

(Action: MPPCB and UPPCB)

- xiii. Examine environmental damage assessment reports submitted by NEERI and IIT BHU, and evaluate the environmental compensation & liability for the damage caused by the ash dyke breach and necessary safeguards to be taken for restoration of environment. Action taken report to be shared with MoEF&CC and CPCB.

(Action: MPPCB)

- xiv. Progress of implementation of action plans, along with timelines in respect of ash utilization and control of pollution may be updated by all Thermal Power Plants, stone crushers and coal mines. A meeting may be convened with the TPPs regarding ash utilisation in various purposes to show best practices and solutions about how several other TPPs are able to achieve 100% utilisation. Status in this regard may be presented in the next meeting.

(Action: UPPCB and MPPCB)

- xv. Estimation of environmental compensation in line with Ash Utilisation Notification, 2021 for non-compliance of targeted ash utilisation or low utilisation of ash by TPPs, and other Industries in Singrauli and Sonbhadra region. Action taken report may be shared.

(Action: CPCB, UPPCB and MPPCB)

- xvi. Action plans submitted by thermal power plants, industries, stone crushers, coal mines and railway sidings in regard to ash utilisation and control of air pollution to be evaluated and compared against Environmental Clearance (EC) conditions and

Consent to Operate (CTO) requirements, and carry out verification of implementation of these action plans. Compliance status to be presented in next meeting of the Mission.

(Action: UPPCB, MPPCB and CPCB)

- xvii. Third-party audit/evaluation for verification of implementation of action plans of TPPs, industries, stone crushers, coal mines and railway sidings in Singrauli and Sonbhadra region may be undertaken by technical institution/ agencies for implementation of action plan as well as compliance EC and CTO conditions. CPCB may create an institutional system for third-party verification of environmental compliances with use of EC funds available with SPCBs.

(Action: CPCB, MPPCB & UPPCB)

- xviii. Concerns regarding implementation of action plans by Eastern Central Railway (Spur III & X and Mahedaiya) & West Central Railway (Gajra Bahra and Bargawan) and construction of railway sidings at TPPs, industries and coal mines for coal and ash transportation by Thermal Power Plants (TPPs), industries, and coal mines in the Singrauli and Sonbhadra region may be addressed and compiled. Report in this regard may be shared with CPCB and MoEF&CC.

(Action: MPPCB and UPPCB)

- xix. Inter-state transportation of ash may be permitted for utilization of ash in the specified eco-friendly purposes along with safeguards for pollution control and mitigation.

(Action: Env. Dept., Govt. of UP and M.P.)

- xx. Notices to be issued for the TPPs & industries (Jaypee Nigrie, Mahan Energen, APMDC & THDC, etc) who are not present during meeting of the Mission.

(Action: MoEFCC)

- xxi. Contracts for supply of ash to users of road construction projects to be finalised by March, 2024 for utilisation of ash from NTPC Vindhyachal and other TPPs of NTPC.

(Action: NTPC and Ministry of Power)

- xxii. A solution to evacuation of the current ash stored temporarily in the ash pond is to be found out for achieving 100% ash utilisation, in line with the prescribed timelines in the Ash Utilisation Notification, 2021.

(Action: MPPGCL)

- xxiii. Submission of environmental damage assessment reports prepared by NEERI in regard to ash dyke breach, to MPPCB within 15 days and laying of pipeline for transportation of ash from TPP to mine void by March, 2024.

(Action: M/s Sasan Power Ltd.)

- xxiv. A notice to be issued for not initiation of construction of railway sidings, in order to complete the construction and ensure coal transportation by rail within the permitted time of 5 years, stipulated timeframe.

(Action: MPPCB & APMDC Ltd.-Suliyari Open Cast Project)

- xxv. Enforcement of 'Environmental Guidelines for Stone Crushing Units' published by CPCB in July 2023, to curb fugitive dust emissions and control of air pollution. SPCBs to prepare a report outlining the applicability of guidelines based on capacity and implementation the said guidelines including emission level in and around stone crushing units pre and post implementation. Status in this regard to be presented in the next meeting.

(Action: UPPCB, MPPCB & All stone crushers in Singrauli and Sonbhadra region)

- xxvi. Submission of action plan indicating timelines for completion of activities in regard to ash utilisation and air pollution control measures. TPPs to plan utilisation in eco-friendly purposes and utilisation in mine voids and low lying areas to be the last resort after exhausting all other eco-friendly purposes.

(Action: All TPPs and Coal mines in Singrauli and Sobhadra)

- xxvii. Initiation of backfilling of ash in allotted mine void of Gorbi Pit no. 3 by Anpara TPS, UPRVUNL. Status may be shared with UPPCB and CPCB.

(Action: UPPCB, UPRVUNL & Anpara TPS)

- xxviii. Finalisation of MoU with UPEDA for supply of ash for road construction projects.

(Action: M/s Lanco Anpara and UPPCB)

- xxix. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd, 3rd, 4th and 5th meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly

basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

Annexure**List of Participants**

1. Smt. Leena Nandan, Secretary, EF&CC- Chairperson
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Shri Anandji Prasad, Advisor (Project), MoC
5. Shri Satyendra Kumar, Director, MoEF&CC
6. Shri Abhishek Singh, DEE/ Mining, MoC
7. H.K. Sharma, Director (Technology), MPPCB
8. R.K. Gupta, S.E., MPPCB
9. Shri Sanjeev Kumar Singh, MS, UPPCB
10. Shri Umesh Kumar Gupta, RO, Sonbhadra, UPPCB
11. Shri Nazimuddin, Scientist F, CPCB
12. Shri N. Subrahmanyam, Scientist D, MoEFCC
13. Shri Mohammed Niyazi, Dir. (S&T), DGMS
14. Shri Satish Kumar, Director (Thermal), MoP
15. Shri Ajay Jha, Director/ EnHM, Railway Board
16. Shri Gaurav Sharma, Director ME/EnHM, Railway Board
17. Shri Amit Kumar, Director, CEA
18. Shri Aman Khare, Dy. Director, CEA
19. Shri Deepak Kumar Raghuvanshi, Dy. Director, CEA
20. Shri Shubham Pachauri, Dy. Director, CEA
21. Shri Praveen Gupta, Member (Thermal), CEA
22. Shri D.K. Sharan, AE, CD-2, Gahziabad, UPPWD
23. Shri Ranjeet Nirmal, District Mining Officer, Directorate of Geology and Mining, GoUP.
24. Shri Gaurav Gahlot, Scientist C, CPCB
25. Shri S.K. Takhele, ED (SSEA), NTPC
26. Dr. Vijay Prakash, ED (Env.), NTPC

27. Shri G., Rajashekar, GM (AMG), NTPC
28. Shri Ashwani Tyagi, DGM (Ash Mgt.), NTPC
29. Shri A.K. Samaiyar, ED, NTPC
30. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
31. Shri Rajeev Sharma, AE, RO Gwalior, MPIDC
32. Shri S.S. Singhal, JE, RO Gwalior, MPIDC
33. Shri Rakesh Singh, RO Gwalior, MPIDC
34. Shri R.S. Yadav, DGM, UPSIDA
35. Prabhat Yadav, Manager (Civil), UPSIDA
36. Shri Abhishek Pal, Manager (Civil), GNIDA
37. Shri Abhishek Singh, Manager (Civil), GNIDA
38. Shri S.K. Dutta, Director (Project), UPRVUNL
39. Shri Anand Kumar, Chief Engineer, UPRVUNL
40. Shri Ravikant Raut, Chief Chemist, MPPGCL
41. Shri N.B. Soni, Executive Engineer (F.A.V.), Sarni STPS, MPPGCL
42. Shri Narendra Malgaye, Executive Engineer, SSTPP Mundi, MPPGCL
43. Smt. Rehana Beg, Resident Engineer, MPPGCL
44. Shri Ravikant Raut, Chief Chemist, MPPGCL
45. Shri Jitendra Prasad, Additional VP-EHS, Sasan Power Ltd. (Reliance power)
46. Shri Santosh Kumar Singh, Head (AESG), Mahan Energen Ltd.
47. Shri Himanshu Verma, Sr. Manager (HSE), Lanco Anpara Power Ltd.
48. Dr. Vinay Kumar Yadav, AGM (Environment & Sustainability), Grasim Industries Ltd.,
Renukoot
49. Shri Sayed M Islam, Sr. Manager (EHS), Birla Carbon Industries Pvt. Ltd.
50. Shri Ashutosh Kumar Dwivedi, Additional CEO, Greater Noida Authority, U.P.
51. Shri Durgananda Jha, SRF, CPCB
52. Shri Avneesh Kumar Chauhan
53. Shri Kamlesh Maurya

54. Shri Indranil Das

55. Shri Vinay Ramaiya

56. SCCL

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F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi – 110003

Date: 19th July, 2024

OFFICE MEMORANDUM

Sub.: Minutes of the seventh meeting of 'Fly Ash Management and Utilization Mission' held on 26.06.2024 - reg.

The undersigned is directed to refer the seventh meeting of 'Fly Ash Management and Utilization Mission' held on 26.06.2024 at 03:00 PM at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 31.01.2024.

2. In view of the above, minutes of the seventh meeting of 'Fly Ash Management and Utilization Mission' is enclosed herewith.

3. It is requested to kindly furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated

Yours sincerely,


(Dr. Satyendra Kumar)
Director

Ph: 011-20819291

Email: satyendra.kumar07@nic.in

To:

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chairman, Ministry of Railways (Railway Board), New Delhi
5. Chief Secretary, State of Uttar Pradesh
6. Chief Secretary, State of Madhya Pradesh

7. Chairman, CPCB, New Delhi
8. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
11. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
12. Director General, Directorate General of Mines Safety, Jharkhand
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
14. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
15. Chairman, UPPCB, Uttar Pradesh
16. Chairman, MPPCB, Madhya Pradesh
17. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
18. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
19. Director, CSIR-NEERI, Nagpur
20. CMD, M/s NCL
21. CMD, M/s NTPC Limited
22. CMD, M/s Lanco Anpara Power Pvt. Ltd.
23. CMD, M/s Hindalco Industries Ltd.
24. CMD, M/s UPRVUNL
25. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
26. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
27. CMD, M/s Sasan Power Limited, Singrauli
28. CMD, M/s APMDC Ltd., Singrauli
29. Industries, Mines and Stone crushers concerned in Singrauli and Sonbhadra Region.

Copy to:-

1. PSO to Secretary (EF&CC)
2. PPS to AS(NPG)
3. SO, HSMD

Minutes of the 7th meeting of Fly Ash Management and Utilization Mission held on 26.06.2024 at 03:00 PM

The seventh meeting of 'Fly Ash Management and Utilization Mission' was convened on 26th June, 2024 at 03:00 PM to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 31.01.2024. The list of participants is enclosed as Annexure.

2. At the outset, Secretary,EFCC welcomed all the participants. Additional Secretary, MoEF&CC briefed about the decisions taken by the Mission in last meeting held on 31.01.2024.

3. A presentation was made by the Madhya Pradesh Pollution Control Board on progress of implementation of action plans and environmental guidelines for stone crushing units published by CPCB for control of air pollution. The following details were presented:

- i. 05 Thermal Power Plants of capacity 12140 MW generated 158.96 LMT ash in Singrauli, Madhya Pradesh in FY 2023-24. Status of implementation of action plan for fly ash utilisation in the region were presented.

TPP name	Year 2021-22		Year 2022-23		Year 2023-24	
	Generation of ash (L MT)	Utilisation (%)	Generation of ash (L MT)	Utilisation (%)	Generation of ash (L MT)	Utilisation (%)
NTPC Vindhyachal Singrauli	82.38	53.05%	76.64	37.31%	66.83	56.2%
Sasan Power Limited	53.47	52.35%	45.99	109.5%	48.98	100%
Mahan Energen Limited	8.36	25.46%	9.08	100.2%	14.27	103.7%
Jaypee Nigrie Super TPP	15.79	89.55%	14.55	100.09%	18.06	89.1%

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Vill. Nigrie, Singrauli						
Hindalco Industries Ltd, Mahan Aluminium, Singrauli	11.54	85.55%	11.82	79.4%	10.82	131.1%
Total	171.54 LMT	56.96%	158.08 LMT	70%	158.96 LMT	83.04 %

- ii. Status of ash utilisation by 15 TPPs in Madhya Pradesh including TPPs in Singrauli:

Year	Ash generation (LMT)	Ash utilisation (LMT)	Utilisation (%)
FY 2021-22	285.12	176.99	62.07%
FY 2022-23	303.06	223.8	73.84%
FY 2023-24	315.3	299.6	95%

- iii. 05 thermal power plants (TPPs) in the Singrauli region have utilized 132.01 lakh metric tonnes (LMT) of ash in FY 2023-24. This includes 4.45 LMT (3.3%) for brick production, 15.16 LMT (11.4%) for filling low-lying areas, 22.5 LMT (17%) for road construction, 26.5 LMT (20.1%) supplied to cement industries, and 63.3 LMT (47.9%) used for backfilling in abandoned mines, overburden (OB) mixing, stone quarry, and dyke raising activities.
- iv. 15 TPPs in Madhya Pradesh have utilized 299.6 LMT generated ash for backfilling in abandoned mines, overburden (OB) mixing, stone quarry, and dyke raising activities (32.9%), roads construction (25.7%), supplied to Cement industries (23.2%), filling low-lying areas (14.4%) and bricks manufacturing (3.6%).
- v. 02 TPPs in M.P. have utilized less than 80% ash in year 2023-24 namely, NTPC Vindhychal, Singrauli (56.2%) and Sanjay Gandhi TPS, MPPGCL (69.01%). Further, ash utilization compliance cycle (03 year) of Jaypee Nigrie STPP was found non-satisfactory for year 2023-24.
- vi. STPSS, MPPGCL raised the concerns regarding difficulty in evacuation of current ash from operational ash as the ash pond is surrounded by hilly terrain

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and there is absence of partition dyke. It was requested to consider the ash dumped in the low lying area of ash pond (up to El 481 M.) to create an operational platform and to construct a partition dyke for 2 lagoons for simultaneous operations.

- vii. CPCB has clarified that as per Ash Utilization Notification, 2021, operational ash pond/dyke cannot be treated as both active ash pond and low-lying area for ash utilization.
- viii. MoU between NTPC Vindhyanchal and CIL was signed on 31.05.2024 for Gorbi Pit 2 for ash filling. Contract signed for supply of ash to NHAI for road construction projects, which expected to increase ash utilization. Rail infrastructure to be constructed for transportation of ash from TPP to Gorbi mine. Creation of platform surrounding mine void for ash backfilling in progress. CTO to be obtained from MPPCB within a month. MoU was signed for development of infrastructure for backfilling activities.
- ix. It was informed that lease rent will be applicable to fly ash dumping, however it will be charged if any, on infrastructure requirement to be built on the land and nominal lease rent will be applicable to the extent the policy approved by the Cabinet. MoU has been signed for 6 road projects 15 LMT. NCL was requested to allow more than 15,000 tonnes per day against 3000 tonnes per day dumping of fly ash in existing pit in Gorbi mine. NCL informed that conditions will be accepted as per SOP and asked them to apply for the permission. Also, MPPCB is requested to permit transportation of ash from thick tarpaulin polythene covered truck from pond to NHAI for 20-30 kms distance only. Expected to achieve 80% ash utilization.
- x. Mines have been allocated to Amarkantak TPS and MoU has been signed.
- xi. Vindhyanchal TPS indigenous pilot plant for carbon capture unit commissioned since year 2022, it captures CO₂ from flue gas. Methanol fuel can be generated as fuel. Operationalization of methanol will be done by Aug 2024.
- xii. NCL operates 08 coal mines in Singrauli, which produced 126.8 million tonnes of coal in FY 2023-24. Details of mode of coal transportation are as follows:

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S. No.	Coal mine	Coal production (Million tonnes) (FY 2023-24)	Mode of Coal Transportation (Million tonnes)		CHP Capacity (MTPA)	
			Rail/ Marry-Go-Round	Road	Existing	Under Construction
1.	Amlohri OCP	15	14.68	0.91	10	2
2.	Bina OCP	10.5	7.52	3.07	4.5	9.5
3.	Block-B OCP	5.47	4.44	1.03	3.5	4.5
4.	Dudhichuwa OCP	25	18.88	3.96	20	5
5.	Jayant OCP	30	28.81	1.29	25	-
6.	Jhingurda OCP	3.34	2.71	0.61	2.5	-
7.	Khadia OCP	15	11.96	3.79	10	4
8.	Nigahi OCP	22.5	20.81	1.96	15	10
	Total	126.81	109.81 (86%)	16.62 (16.6%)	90.5	35

- xiii. Action plans have been submitted by 05 Thermal Power Plants, 08 NCL coal mines, 04 private mines, 56 stone crushers and 08 railway sidings (03 ECR; 03 ECR; 02 NCL) for implementation of pollution control measures.
- xiv. The following activities form action plan of various industries in M.P. have been reported under progress:
- a. M/s NTPC Vindhyanchal STPP, Singrauli (13 units)
- FGD installation for SO₂ in 12 units by June, 2025
 - NOX emission control measures
 - % increase in fly ash utilisation (non-satisfactory for FY 2023-24)
 - Renovation & modernization of ESP by Oct., 2024

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- Installation of Mechanized cleaning system by May, 2024
 - Inventorization study for industries operating around the Rihand reservoir (contract awarded for 2 years)
- b. M/s Sasan Power Limited
- FGD installation for SO₂ by Dec. 2026
 - Construction of pipeline for fly ash transportation by Dec., 2024. Orders issued for procurement of equipment.
 - Gawaiya/Garra nallah- Some deposit is still there (Verification to be done by RO)
- c. M/s Mahan Energen limited
- FGD installation for SO₂ by Dec., 2026
 - Development work of railway siding. Railway's approval is pending.
 - Transportation by Merry go round by Dec., 2026
- d. M/s Hindalco Industries Ltd.: Installation of FGD installation for SO₂ in Unit-1,2,3,4,5 by Dec. 2026 and construction of RCC road by Aug. 2024.
- e. Jaypee Nigrie STPP: Installation of FGD installation for SO₂ by Dec., 2026 and % increase in fly ash utilisation (non-satisfactory for FY 2023-24).
- f. Northern Coalfields Ltd., Singrauli: Submission of final report on study conducted by CIMFR on backfilling of fly ash in OB in Nigahi Mine by October, 2024.
- g. NCL, Khadia Project
- Carrying capacity of Mine & traffic study (EC Condition) by Dec., 2024
 - Installation of CEQMS (EC Condition) by May, 2024
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
- h. NCL, Amlori Project
- Installation of 01 CAAQMS (EC Cond.) by Sep., 2024

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- Transportation of material by rail/conveyor belt (EC Cond.) by Dec., 2024
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
 - Carrying capacity of Mine & traffic study (EC Cond.)
- i. NCL, Nigahi
- Additional 10 MTPA CHP by Dec., 2024
 - Construction of CC Road (Nigahi wharf wall to Central workshop) by Dec., 2024
 - Installation of CEQMS at ETP (EC Cond.) (Connectivity is pending)
 - Deployment of trucks based on Hybrid Fuel Technology/ CNG/ EVs (EC Cond.) by Dec., 2024
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
- j. NCL, Jayant Project
- Installation of CWQMS
 - Deployment of trucks based on Hybrid Fuel Technology/ CNG/ EVs (EC Cond.). Timelines not given.
 - Installation of fixed type fog canon (EC Cond.) by July, 2024
 - Fixed type water sprinkler along haul road till CHP, Rly siding & OB dump area (EC Cond.) by August, 2024
 - Eco park will be developed (EC Cond.) by March 2025
 - Carrying capacity of Mine & traffic study (EC Cond.) by Dec., 2024
 - Action plan for cleaning of balliya nallah. Timelines not given.
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
- k. NCL, Block-B Project
- 4.5 MT coal handling plant by Oct., 2024

- Other roads by June 2024
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
- I. NCL, Dudhichua Project
- Approach road in front of GM office (500 m) (Completed, verification awaited)
 - Study of existing ETP (Oversight committee observation). Report awaited.
 - Action plan for cleaning of baliya nallah. Timeline not given.
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024.
- m. NCL, Bina ext.
- Construction of CHP of 9.5 MTPA Capacity by June, 2024
 - ETP upgradation by July, 2024
 - Installation of CEQMS (connectivity to CPCB server)
 - Installation of Automatic wheel washing system (Added on 01.06.2024) by Dec., 2024
 - Carrying capacity of Mine & traffic study (EC Cond.) by Dec., 2024
- n. NCL, Jhingurda: Plantation over an area of 60 Ha within a period of 02 year (EC Condition) by FY 2025-26 and installation of automatic wheel washing system (Added on 01.06.2024) by Dec., 2024.
- o. APMDC Ltd.-Sulyari Open Cast Project
- Fly ash utilization in OB. Timeline not given
 - Immediate Installation of CHP (EC Cond.) by March 2025
 - Railway siding construction without delay (EC Cond.) by March 2025
 - Crusher and in-pit belt conveyor with mist type sprinkler (EC Condition). Timeline not given
 - CWQMS in ETP/STP (EC Condition). Timeline not given.

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- ETP for workshop & CHP (added on 01.06.2024). Timeline not given.
- p. Sasan Power Limited (Moher & Moher Amlohri extension coal mine)
- Utilizing fly ash in OB Dumps
 - Procurement of mist canon by March 2024
 - Rehabilitation & resettlement of affected people – Silt removal is going on, planning to erect barriers by May, 2024
- q. Jaiprakash Power Ventures Ltd., Amelia (North) Coal Mine
- Fly ash utilization in OB dumps will be done according to CIMFR study. Report awaited.
 - Plantation on dump area towards kanchan river (EC Cond.) by Monsoon 2024
 - Fixed water sprinklers near railway siding (EC Cond.) by Aug., 2024
 - Dedicated road for coal transportation within ML & Outside ML up to NH with air pollution measures like Fog canons, wind barrier & green belt (EC Cond.). Timelines not given.
- r. THDC India Ltd., Amelia Coal Block (New mine)
- Fly ash utilization in OB dumps will be done according to CIMFR study. Timelines not given.
 - Construction of CHP with RLS – under progress for 10.68 km out of 14 km by Nov., 2024
 - Construction of Permanent railway siding- Land not allotted by year 2026
 - Ultra sonic Flow meter in ETP/STP (EC Cond.) by Sep., 2024
 - Installation of 03 No. Of CAAQMS. (EC Cond.). 01 operational and 01 proposed.
 - Installation of STP for township (CTO Cond.). Timelines not given.
- s. East Central Railway, Spur III & X
- Fixed water sprinklers by Sep., 2024
 - Work as per CPCB Guidelines by Dec., 2024

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- Status of control of dust found un- satisfactory
- t. East Central Railway, Mahedaiya
- Fixed water sprinklers by Sept 2024
 - Wind breaking wall by Sept 2024
 - Construction of approach road by Sept 2024
 - Work as per CPCB Guidelines by Dec 2024
 - Status of control of dust found un- satisfactory
- u. West Central Railway, Gondawali showed no substantial progress w.r.t. the following activities:
- Green belt around coal siding area by Sep., 2024
 - Dust Protection walls by Dec., 2024
 - Water sprinkling system or tankers by Dec., 2024
 - Drainage facility by Dec., 2024
 - A pucca circulating handling area by Dec., 2024
 - All weather approach Road by Dec., 2024
- v. West Central Railway, Bargawan showed no substantial progress w.r.t. the following activities:
- Dust Protection walls (1300 m) by Dec., 2024
 - Water sprinkling system -1000 m by Aug., 2024
 - A pucca circulating handling area by Aug., 2024
 - Drainage facility by Aug., 2024
 - All weather approach Road by Aug., 2024
 - Green belt around the coal siding area by Sep., 2024
- w. West Central Railway: Gajra Bahra
- Dust Protection walls (1.5 m height extension). No timeline reported.
 - Water sprinkling system -500 m- Wall mounted sprinkling system- Material received. No timeline reported

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- Water sprinkling system -700 m- Movable sprinkling system. No timeline reported
 - Pucca circulating handling area
 - All weather approach Road. No timeline reported
 - Green belt around the coal siding area. No timeline reported
- xv. Action plans have been submitted by 56 stone crushers. 48 stone crushers have installed dust containment system, 41 installed wind breaking wall, 48 have arrangements for regular cleaning and wetting. 08 stones crushers are closed by Collector, Singrauli.
- xvi. Direction issued to Collector, Singrauli & RO vide dated 18.04.2024 to submit action plan for stone crushers as per CPCB Guidelines. RO, Singrauli issued directions to crushers vide dated 30.04.2024 to install air pollution control equipment as per CPCB Guidelines. Closure notices were issued to 15 stone crushers (capacity 200 TPH) by RO, Singrauli for non-installation of air pollution control equipment.
- xvii. Notices were issued to 23 TPPs, industries, coal mines and railway sidings for non-compliances of action plan in May, 2024. Environmental compensation of approximately Rs. 138.7 crore have been levied on 13 TPPs/coal mines/railway sidings for non-compliance. The order of NGT dated 18.01.2022 has been quashed by Hon'ble Supreme Court.
- xviii. MS, CPCB chaired a review meeting held on 30.04.2024. The following recommendations were made:
- TPPs having low ash utilization were directed to submit monthly action plan for achieving 100% ash utilization. All TPPs and coal mines to complete pending activities listed under action plans and submit time-bound action plan to comply with the conditions mentioned in EC and Water/ air consent.
 - Sasan Power Ltd. to remove fly ash flowing into Gawaiya and Garra drain and construction of pipeline for ash transportation.
 - Mahan Energen to hold meeting with WCR, Jabalpur for non-availability of space for rail transportation of ash.

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- Instructions to ECR & WCR for storing coal inside the premises and imposition of penalties against non-compliance.
 - ECR and WCR to submit time-bound action plan to comply with the conditions mentioned in Water/ air consent.
- xix. A review meeting was held by Collector, Singrauli on 12.06.2024.
- xx. Sasan Plant has shifted from pipeline to road for fly ash transportation from ash dyke to its mine for mixing with overburden. Currently, it is generating 4 Lakh MT per month. For transporting through pipeline, change in law was claimed in CERC and the petition is pending for hearing (Regulatory approval is in progress). Approval for Conveyor belt of 18 km from their plant to mine for ash transportation, was obtained from DGMS. At present, 5100 MT per day (~200 trips per day) of ash is being transported.
- xxi. Mahan Energen proposed railway sidings for ash transportation. Coal transportation from Singrauli and Suliyari mines will be done through conveyer belt to the TPP. Forest (Stage 2) clearance will be obtained by July 2024 and construction will start afterwards.
- xxii. Timelines for deployment of trucks not available due to non-availability of CNG and EV trucks in mining areas by Jayant Project. Request for modification in EC conditions will be placed.
- xxiii. Pollution control measures earlier were being implemented in stone crushers as per MPPCB guidelines. After CPCB published guidelines in 2023, it is being implemented as per CPCB guidelines which mandate every stone crushers for installation of dust control equipment.
4. A presentation was made by the Uttar Pradesh Pollution Control Board on the progress of implementation of action plans and environmental guidelines for stone crushing units published by CPCB for control of air pollution. The following details were presented:
- i. 06 TPPs in Sonbhadra namely, M/s UPRVUNL, Anpara TPS, M/s UPRVUNL, Obra TPS, M/s NTPC Shaktinagar TPS, M/s NTPC Rihand Nagar, M/s Hindalco Industries Ltd. (Renusagar) and M/s Lanco Anpara Power Ltd have submitted 5-year action plan for 100% utilisation of ash.

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- ii. 06 TPPs of capacity 10670 MW produced 160.7 LMT ash in FY 2023-24. Status of fly ash utilization by 06 TPPs in Sonbhadra, U.P. were reported as below:

Financial Year	Total quantity of ash generated (LMT)	Total quantity of ash utilised (LMT)	% ash utilisation
2021-22	151.1	57.9	38.3%
2022-23	161.9	56.8	35.08%
2023-24	160.7	101.8	63.3%

- iii. 03 TPPs in Sonbhadra region have low ash utilisation level namely, Lanco Anpara (23.6%), Anpara, UPRVUNL (51.67%), NTPC Shaktinagar (40.4%). Anpara 51.67%, published 2 EOIs for establishment of cement plants and transportation of ash, discussed with various vendors and will be finalized and low lying areas have been identified. Shaktinagar (2 million tonnes) and Vindhyanchal (8 Million tonnes) are at same location and are adjacent to each other has been facing difficulty in utilisation. It was informed that Ash will be supplied to NHAI and road construction projects. NTPC Singrauli is also signing agreements for gorbi mine and utilization in road project. Lanco (23.6%), orders were given for 15 LMT ash, NCL has been requested for allocation of mine void for ash disposal. NCL informed that mine closed to the TPP will be closed in 1.5 yr and will be allocated accordingly.
- iv. Out of 101.8 LMT ash generation in FY 2023-24, 46.9 LMT ash was filled in low lying areas, 38.69 LMT was utilised in construction of roads and highways, 13.3 LMT ash supplied to cement industries, 2.33 LMT supplied to brick manufacturers and 0.43 LMT ash were used for construction of geo polymer roads.
- v. Sonbhadra region has 05 NCL coal mines and had produced total 59.48 MTPA coal in FY 2023-24. Details of mode of coal transportation are as follows:

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S. No.	Coal mine	Coal production (Million tonnes) (FY 2023-24)	Mode of Coal Transportation (Million tonnes)			CHP Capacity (MTPA)	
			Rail/ Marry- Go- Round	Road	BPC	Existing	Under Construction
1.	Bina OCP	10.5	7.52	3.07	-	4.5	9.5
2.	Dudhichuwa OCP	25	18.88	3.96	-	20	5
3.	Kakri OCP	1.84	0.98	1	-	-	-
4.	Khadia OCP	15	11.96	3.79	-	10	4
5.	Krishnashila OCP	7.5	4.96	1.67	2.68	4	-
	Total	59.84	44.3 (74%)	13.49 (22.5%)	2.68	38.5	18.5

- vi. Action plans have been submitted by 06 TPPs, 03 industries, 05 coal mines (NCL), and 313 stone crushers for implementation of air pollution control measures. The following activities form action plan of various industries in U.P. have been reported under progress:
- M/s NTPC SSTPS, Shaktinagar to install FGD in all 7 units and expand AWRS capacity by March, 2025.
 - In M/s NTPC Rihandnagar SSTP, commissioning of FGD and DAES (Stage I & III) by 31.12.2025 and commissioning of Cold Fog Dust Suppression System in Stage I in progress.

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- c. M/s Lanco Anpara Power Limited, Anpara - FGD installation by December, 2025
- d. M/s U.P. Rajya Vidyut Utpadan Nigam Ltd. (Anpara A, B & D TPS), Anpara-
- Re-tendering for ESPs installation at ATPS by Dec., 2026
 - Renovation work under progress at BTPS by October, 2024
 - FGD installation at A, B & D TPS by Dec., 2026
 - Constructing Bio-methanation plant by Dec., 2026
- e. M/s Hindalco Industries Limited, Renusagar Power Division- FGD installation by March, 2025.
- f. M/s U.P. Rajya Vidyut Utpadan Nigam Ltd. (Obra A, B - TPS), Obra- FGD installation by March, 2025.
- g. M/s NCL Ltd., Bina Project, Bina- Construction of new CHP (9.5 MTPA) by Dec., 2024 and upgradation of ETP & STP by July, 2024.
- h. M/s NCL, Dudhichua Project- Tyre washing system/mechanism of Coal transporting vehicles on Road by August, 2024. Construction of new CHP (10 MTPA) by Dec., 2024.
- i. M/s NCL Ltd., Kakri Project- Tyre washing system/mechanism of Coal transporting vehicles on Road. Tender under progress.
- j. M/s NCL Ltd., Khadia Project
- ETP upgradation by July, 2024
 - Tyre washing system/mechanism for Coal transporting vehicles on Road by Dec., 2024. Tender under progress.
 - Construction of Wharf wall / Railway Siding by August, 2024. Rail connectivity to wharf wall to be done by ECR railway siding.
- k. M/s NCL Ltd., Krishnashila Project- Construction of sedimentation ponds and green belt under progress. EC conditions to be included in action plan.
- l. Aluminium Smelter: M/s HINDALCO Industries Ltd, Renukoot- Procurement of equipment for segregation of waste category under progress.

- m. It was informed that a tripartite agreement was signed between the UP Forest Department, IIFM Bhopal, and AAI 18.08.2023 to conduct a pilot study assessing the impact of filling abandoned mine voids in 0.55 hectares forest areas (Dalla Range, Obra Forest Division) with red mud and/or fly ash. IIFM has prepared the DPR for this project. DFO Obra has obtained the CTO from 12.12.2023. Dewatering and wall grouting work has been completed, however, surface water seepage was observed resulting in water accumulation at the site. Committee visited the site to assess the situation and suggested that this issue could be resolved by filling natural soil up to a height of approximately 5 meters. IIFM issued a letter on 07.06.2024 to commence backfilling. AAI has shared the work execution schedule with IIFM and DFO Obra, w.e.f. 15.06.2024 to 04.06.2025. On-site work execution will begin after the monsoon season.
- n. M/s Grasim Industries Limited Chemical Division, Renukoot and M/s Birla Carbon India Pvt. Ltd., Renukoot- Miyawaki Plantation outside plant premises will be done.
- vii. 313 nos. of Stone Crusher units inspected. 215 Stone crushers have adequate APCS such as covered conveyer system, covered jaw crusher, water sprinkling arrangement, wind breaking wall, green belt, pucca roads etc. 98 Stone Crushers had not installed adequate APCS.
- viii. Based on the inspections carried out by Joint Committee, Show cause notices were issued to 70 stone crushers (50 are revoked, 20 are effective) and closures were issued to 28 stone crushers (15 revoked, 13 effective) for non-installation of APCS out of total 98 stone crushers in the region. An action plan and checklist were provided to the stone crushers, and the units have made commitments. The status will be verified by the Joint Committee after the monsoon season.
- ix. In Sonbhadra region, ambient air quality was analysed to assess, the impact of implementation measures by various TPPs. PM10 level has slightly increased to 160 µg/m³ in 2023-24 from 159 µg/m³ in 2022-23. AQI has slightly increased to 140 in 2023-24 as compared to 139 in 2022-23.

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- x. For Assessment of CEPI Score in pre monsoon, sampling of Ground, Surface Water and monitoring of ambient air quality/ air quality has been done by UPPCB. Evaluation of CEPI Score is under progress.
5. A presentation was made by Ministry of Power/ CEA on status of implementation of the provisions of Ash Utilization Notification, 2021 for mandatory 100% utilisation of ash by TPPs:
- i. Ministry of Power has issued guidelines regarding streamlined procedure for ash disposal on 15.03.2024. These guidelines also include the special provisions for MSEs, in line with amendment to Ash Utilization Notification, 2021 dated 01.01.2024. The Guidelines have been circulated to all TPPs and other concerned stakeholders.
 - ii. The above guidelines lay down the general procedure for TPPs to invite bids on annual basis/longer period (not more than 3 years), limited auction to reserve quantity of ash for supply to MSEs at reserved price, open auction for all users, environmental safety issues, monitoring for entire ash disposal station, post closure reclamation of site etc.
 - iii. MoP vide its OM dated 01.05.2024 has requested MoC to align the draft SOPs with the steps for ash disposal outlined in the MoP guidelines dated 15.03.2024, to be followed by all TPPs as a regulatory requirement. MoP has stated that their comments are yet to be confirmed by MoC for finalising the draft SOPs.
 - iv. So far, 145 TPPs have submitted annual compliance report the FY 2023-24.
 - v. Compliance report of TPPs for the first year (FY 2022-23) of the first compliance cycle submitted by CPCB on 20.02.2024, the TPPs listed therein having ash utilization above 80% has been shared with all TPPs vide email dated 21.05.2024. CPCB has been requested to share the compliance report for the second year (FY 2023-24) of the first compliance cycle.
 - vi. Contracts for supply of ash to users of road construction projects from NTPC Vindhyachal and other TPPs of NTPC are in place and ash is being supplied as per demand and availability at NHAI / MoRTH end. It was also informed that that from either end, ash transportation panel/mechanism as per the MoP Guidelines & Secretary, Power meeting decision dated 18.01.2023 is in place.

6. A presentation was made by Ministry of Coal on finalisation of SOPs for backfilling of ash in mine voids and mixing of ash in overburden dumps by Thermal Power Plants:

- i. Central Working Group on 03.05.2024 under chairmanship of AS, Ministry of Coal allotted the following mines to TPPs-
 - a. CCL- Dakra- Bukbukamine allocated to NTPC and Hindalco Industries Ltd.
 - b. ECL-Spot 1, 2 & 3 of Madhabpur OC allocated to DVC- DSTPS
 - c. SECL Minni OCM-Dry Patch & Minni OCM near SISF Base camp of Govinda Mine allocated to MB Power (Madhya Pradesh) Limited
 - d. ECL-Parbelia Colliery (UG), Dubeswari (UG) and Nasramuda (UG) allocated to DVC-RTPS (Fly ash is already being supplied)
 - e. WCL- Sarni (UG) allocated to MPPGCL- STPS
 - f. ECL- Kunustoria, Ningha Mines, Pandebeshwar Mines allocated to DVC-DSTPS
 - g. ECL- Satgram Incline Colliery allocated to DVC-MTPS
- ii. MoC as on date have allocated 38 mines voids to 31 TPPs. Ash filling has been started in 12 mines and 295 lakh cum out of 1800 lakh cum allocated mine void have been dumped in the mine void.
- iii. Central Level Working Group recommended that coal companies and TPPs ensure the signing of MoUs for the allotment of mine voids within 2 months. Further, coal companies were requested to identify abandoned mines on a monthly basis and provide the list to the CEA, which will publish it, and TPPs will respond accordingly.
- iv. Draft SOPs have been communicated to all the stakeholders including TPPs and SPCBs. The format for TPPs to request mine allocation from the CEA has been circulated to all TPPs.
- v. It was informed that different coal companies will identify mines and circulate the information to the committee and all TPPs. TPPs will submit their requests through the CEA, which will examine the requests and communicate them to the committee. The committee will meet monthly to decide on allocations of

mine voids to TPPs. For operational opencast mines, various studies have concluded that it is unsafe to consider fly ash dumping unless the plants and mines are owned by the same organization. It was mentioned that the closed or abandoned opencast mine, closed or abandoned void of working opencast mine and closed or working underground mines (coal extraction by stowing method) may be considered for allotment for the purpose of fly ash filling/stowing.

- vi. Lease rent which has been paid to the State Government by coal companies is to be recovered from TPPs. Further, policy guidelines for use of land acquired under the Coal Bearing Areas (A&D) Act, 1987, vide MoC OM no. 43022/1/2020-LAIR dt: 22-04-2022 may be followed.
 - vii. The guidelines regarding responsibility of mine owners and TPPs after the site is handed over to TPPs for fly ash disposal have been issued on 15.03.2024.
5. A presentation was made by Indian Bureau of Mines (IBM), Ministry of Mines on finalisation of SOPs for backfilling of ash in mine voids and mixing of ash in overburden dumps by Thermal Power Plants:
- i. NTPC is doing pilot study for mixing of ash with overburden in Dulanga coal mine. IBM is monitoring the ultimate impact whether slope moving vertically or horizontally.
 - ii. Further, list of 197 abandoned non-coal mines and 7 working mines with 12 pits have been shared.
 - iii. SOP provides a detailed procedure for allocating mines for ash filling in mine voids or mixing of ash with the overburden, prescribing the roles of different authorities and the steps involved for Thermal Power Plants (TPPs).
 - iv. District Collector and Directorate of State Mines and Geology (DGM) will be the appropriate authority for abandoned mines and operational mines, respectively for overseeing environmental conditions for TPPs. District Collector and DGM to assess the mine voids and conduct a survey within 15 days, respective TPP to borne the cost of survey. TPPs to approach the concerned authority, under whose jurisdiction is the mine to be utilized, for disposal of ash. The identified volume of mine void / OB to be communicated to the TPP within 30 days of receipt of application by TPPs and upload on ash portal, simultaneously SPCB,

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MoEFCC, District Collector (for transportation of fly ash) and CGWA/ CGWB to grant NOC within 30 days.

- v. In case of operational mines, a scientific / geo-technical stability study is to be furnished by TPP to DGMS within 30 days from the date of application. The Director Mines Safety shall furnish their comments on the said study. After the receiving the comments, appropriate authority to grant final approval for backfilling of ash in allotted mine voids. Further, before starting the backfilling work a comprehensive scheme for fly ash filling is to be prepared by the TPPs covering specified scientific aspects and other allied issues. SOP/ guidelines for MoU has been prepared to establish a formal agreement between the TPP and the designated Mine/s.
 - vi. IBM emphasized the importance of safety aspects in regard to ash backfilling and the need for a model code to be approved by an agency.
 - vii. Permission form DGMS is required only for ash filling in operational mine.
6. A presentation was made by Railway Board on status of implementation of air pollution control measures at East Central Railway and West Central Railway in Singrauli and Sonbhadra regions:
- i. Following pollution control measures have been reported under progress by ECR and WCR:
 - a. Singrauli region, M.P.
 - ECR-Spur III & X: Installation of fixed water sprinklers (Sep., 2024) and Work as per CPCB Guidelines (Dec., 2024).
 - ECR- Mahedaiya: Installation of fixed water sprinklers, work as per CPCB Guidelines and construction of wind breaking wall by Sep., 2024, and approach road by Dec., 2024.
 - WCR- Gajra Bahra: Dust Protection walls (no timelines given), water sprinkling system (wall mounted and movable), Ppucca circulating handling area, all weather approach road (no timelines given) and green belt around the coal siding area (status to be updated).
 - WCR- Gondawali: Dust Protection walls , water sprinkling system or tankers, drainage facility, pucca circulating handling area, all weather

approach road by Dec., 2024 and green belt around the coal siding area by Sep., 2024.

- WCR- Bargawan: Dust Protection walls by Dec., 2024, water sprinkling system, drainage facility, pucca circulating handling area, all weather approach road by Aug., 2024 and green belt around the coal siding area (Sep., 2024).

b. Sonbhadra region, U.P.

- ECR- Krishanshila Project: Construction of wind breaking wall, plantations all along the boundary wall, construction of garland drain, installation of water sprinklers and construction of rain water harvesting–cum-ground water recharge system (approval in process under current budget).
- ECR- Salaibanwa: Construction of wind breaking wall, Plantations all along the boundary wall, construction of garland drain, installation of water sprinklers, construction of rain water harvesting–cum-ground water recharge system, construction of approach road, construction of wharf (approval in process under current budget).

ii. It was informed that Vindhyanchal TPS, in principle, was allowed to transport fly ash through rail to MHDA goods shed from where fly ash shall be transported upto Gorbi mines for back filling. Approval from Railway Board has been given to VTPS for construction of individual conveyor belt or silos for ash transportation. IPA issued on 09-04-2024.

iii. Action has been initiated to use fly ash from CTPS power plant for stowing/backfilling for stabilization of one of the fire affected zone near railway track at Sonardih station in Dhanbad division.

7. CPCB presented the status of actions taken on various decisions of the Mission:

- Status of action taken on decisions of 1st, 2nd, 3rd, 4th, and 5th meetings of the Mission obtained from the stakeholders are as follows:

Meeting	No. of Decisions	Complied	Regular activities	Time-bound / Yet to comply
1st	11	7	3	1
2nd	18	13	3	2
3rd	23	13	4	6
4th	21	10	8	3
5th	22	12	7	3

*Actual 'time bound / yet to comply' decisions are related to - Feasibility study for OB in Nigahi mines , Health risk assessment studies by SPCBs , Desiltation, reclamation and stabilization of ash by UPRVUNL plants and its verification by Forest Dept. , GIS mapping of TPPs and coal mine pits by MoC , Review of EC condition of non-coal mines , Cost-benefit analysis on non-compliance by TPPs , Backfilling of ash in Gorbi mine pit 3 by Anpara TPS

- ii. Implementation status has been compiled and updated on CPCB's website.
- iii. Instructions have been issued to MPPCB and UPPCB to create a system/mechanism for third-party audit/evaluation for compliance verification of industries by SPCB-authorized technical institutions/ agencies.
- iv. Brief status of implementation of action plans by 18 TPPs// coal mines/ industries were presented as under:
 - a. 07 industries (NTPC Vindhyachal, NTPC Rihand, Lanco Anpara C, Birla Carbon India Pvt. Ltd., M.P. Power Generating Co. Ltd. (MPPGCL), Mahan Energen Ltd. and Grasim Industries Ltd. Chemical Division) have implemented their action plans (except for FGD installation in case of Lanco Anpara C and NTPC Rihand, having FGD implementation time limit up to Dec 2025 and Dec 2026, respectively, and one remaining point of Grasim Industries Ltd which is sub-judice in the Hon'ble Supreme Court and is presently under stay.
 - b. HINDALCO Aluminum Smelter also reported implementation of action plans. However, the Oversight Committee has observed partial implementation of action plans (w.r.t. ZLD for domestic effluent and control of fugitive emissions).
 - c. 10 TPPs/ coal mines (NTPC Singrauli, Renusagar TPP, UPRVUNL Anpara TPS, UPRVUNL Obra TPS, Sasan Power Ltd., NCL Dudhichuwa Mine, NCL Kakri Mine, NCL Khadia Mine, NCL Bina and NCL Krishnashila) have submitted extended tentative time limits for implementation of few points (mainly related to tyre washing facility, 25% mixing of ash with OB, transportation of coal in

environmentally sound manner, management of municipal solid waste, and OCEMS relocation).

- d. UPRVUNL Obra TPS has stopped ash pond overflow water carrying ash into the river Renu.
 - e. UPRVUNL Anpara TPS has implemented ZLD by commissioning new ETP of 30 MLD capacity in Anpara A & B plants.
 - f. UPRVUNL Anpara TPS has issued LOI to M/s CWPRS, Pune for study of diversion of Morcha Nala, and the study work is likely to be completed up to July, 2024.
 - g. NTPC Singrauli is implementing measures to completely stop the discharge of ash pond overflow into Rihand reservoir.
 - h. Trucks transporting coal from coal mines to TPPs are found covered with thin LDPE sheets/ green net only, instead of tarpaulin or other proper means, due to which spillages occur at several locations and fine coal dust is found along the public road (Auri Mode-Shakti Nagar) and the black powder is also visible on the houses built along the roadsides as well as vehicles parked.
 - v. CEPI score calculated by UPPCB and MPPCB has been re-validated in February 2024. CEPI score of Singrauli was 60.49 (2024) as compared to 61.38 in 2022. CEPI score of Sonbhadra was 67.86 (2024) as compared to 67.88 in 2022. Both Singrauli and Sonbhadra region are under Severely Polluted Areas category. A portal has been developed for monitoring of progress of CEPI Action Plan & CEPI Score of concern critically and severely polluted areas.
 - vi. Jadavpur University has commenced the study for value added utilization of bottom ash as partial substitute of natural sand in concrete in April, 2024. Samples of bottom ash from 5 out of 10 TPPs have been collected, and analysis has started. Additional bottom ash samples from 3 more TPPs will be collected between June, 2024, and July, 2024.
8. A presentation was made by CSIR-NEERI on stabilization of fly ash dumps with bamboo plantation:
- i. NEERI has highlighted the potential long-term environmental concerns associated with fly ash if not managed properly, citing the presence of non-

essential heavy metals like Cd, As, Pb, Hg, and Cr. In response, NEERI has developed Eco-Rejuvenation Technology aimed at stabilizing fly ash dumps by utilizing site-specific plant species (Bamboo sp.) to foster biodiversity on degraded land. NEERI has utilized consortia of microorganisms (bacteria and fungi) and organic waste material to enhance plant growth in the rhizosphere. It was informed that selection of plant species is crucial and varies depending on local environmental conditions.

- ii. NEERI collaborated with M/s Mahagenco to achieve 20-ft plant growth in fly ash dump areas using commercial bamboo species, requiring only a tenth of the typical investment. This approach effectively reduced soil and air pollution (PM₁₀) as well as metal leaching into groundwater within two years. It significantly increased belowground biomass and transformed 31 acres into forest, mirroring successful outcomes near Nagpur and at NEERI's own facilities, where 20 acres were reforested with a similar approach.
 - iii. A case study was presented wherein, over 03 years, the initiative yielded 74.04 tonnes per hectare of total biomass, releasing 98.84 tonnes per hectare of oxygen and sequestering 37.02 tonnes per hectare of CO₂. It also boosted biodiversity by enhancing flora and fauna. A significant reduction in the concentration of heavy metals in the fly ash dumpsite was observed. India boasts 137 bamboo species covering 16 million hectares. According to the specified guidelines, species that enter the food chain should be avoided when restoring degraded land.
8. It was informed that TPPs are required to submit annual compliance report in the format prescribed in Ash Utilization Notification, 2021. However, ACRs or compliance reports received are not completely filled by TPPs.
9. Concerns with respect to air pollution control measures at ECR and WCR railway sidings, were forwarded to Secretary (Railway Board) on 02.5.2024.
10. ACS, Dept. of Energy, Govt. of U.P. was requested to review the status of low ash utilization by Lanco Anpara, UPRVUNL (15.8%), NTPC, Shaktinagar (40.5%) and NTPC Rihandnagar (70.02%) and issue necessary direction for 100% ash utilization.
11. Notices were issued to M/s Jaypee Nigrie, M/s Mahan Energen, M/s APMDC Ltd.& THDC Ltd. and other TPPs and industries for non-participation in the Mission

meeting. Concerned SPCBs were requested to direct respective TPPs, Industries, coal mines to ensure participation of one representative from each organisation in the Mission meetings.

12. After detailed deliberations, the **following decisions were made:**

- i. SOPs formulated for allocation of mines, signing of MoUs and feasibility studies for mixing of ash with OB/ backfilling of ash in opencast and underground mines to be finalized within one month. Ministry of Coal may convene a meeting with Ministry of Power to consider the views of M/o Power for finalising SOPs.

(Action: M/o Coal and M/o Power)

- ii. Status of allocation of identified mines voids to the thermal power plants along with the timelines may be presented in next meeting of the Mission.

(Action: M/o Coal)

- iii. Allocation of mine void to NTPC Lanco Anpara for backfilling of ash into the mine void to achieve 100% ash utilization target.

(Action: M/o Coal and NCL)

- iv. NCL to establish a system for the advance allocation of mines approaching for closure in 3-5 years to thermal power plants to ensure timely initiation of ash backfilling into the mine voids. A list of these mines should be shared with TPPs, enabling them to approach the mines based on geographical location.

(Action: NCL and M/o Coal)

- v. CEA to compile legacy dumpsite which are being stabilized by TPPs.

(Action: M/o Power and CEA)

- vi. SOPs may be revised stating that NOCs are required exclusively from SPCBs for backfilling of ash in the mine void and mixing of ash with overburden dump in abandoned mines, and from DGMS only for backfilling activities in working underground mine. A standardized format for NOCs should be established to streamline the process of seeking necessary permissions by TPPs from concerned authorities for allocation of mine voids, thereby eliminating the

necessity for diverse information requests from different entities. Updated list of identified abandoned non-coal mines may be shared with MoP.

(Action: Ministry of Mines)

- vii. Verification and monitoring of implementation of action plans against the specified timelines in regard to EC conditions and Consent to Operate (CTO) requirements. CTO may be granted once all EC conditions are satisfactorily met, aiming to avoid discrepancies for effective implementation of the action plan. Status regarding pending activities along with the revised timelines to be presented in next meeting of the Mission.

(Action: MPPCB and UPPCB)

- viii. Submission of action plan indicating timelines for completion of activities in respect of ash utilisation in overburden dumps and implementing air pollution control measures as per EC conditions.

(Action: MPPCB and APMDC Suliyari project)

- ix. All stone crushers to ensure implementation of action plan and installation of air pollution control equipment in line with the environmental guidelines published by CPCB for stone crushers. Compliance status may be furnished by SPCB and CPCB.

(Action: MPPCB, UPPCB and all stone crushers in Singrauli and Sonbhadra region)

- x. Evaluation of CEPI score for pre-monsoon (April-May) season in Singrauli and Sonbhadra is to be completed and share the report with CPCB. CPCB to monitor progress of implementation of CEPI Action Plan & CEPI Score of concern critically and severely polluted areas.

(Action: MPPCB, UPPCB and CPCB)

- xi. Scrupulous implementation of action plans to achieve 100% ash utilization as per the compliance cycle prescribed under Ash Utilization Notification, 2021.

(Action: M/ UPRVUNL Anpara TPS, Obra TPS and all TPPs)

- xii. Coal companies to use conveyor belt or dedicated roads for coal transportation to control coal dust emission. The condition of roads used for coal

transportation should be mapped to control fugitive coal dust emissions in the region. Coal transportation via conveyor belts and tire washing mechanisms should also be included in the mapping. The concerned authority should be responsible for maintaining these roads, with regular monitoring conducted to verify their condition. SPCBs to map the responsibility of each segment of coal/ash/material transportation in the region.

(Action: All Coal mines in Singrauli and Sonbhadra region, MPPCB & UPPCB)

- xiii. A team of officials from CPCB, MPPCB and representatives from MPPGCL shall carry out inspection of ash pond of Sanjay Gandhi TPS, Birsinghpur to ascertain localized/ terrain specific solution for evacuation of current ash from operational ash dyke of SGTPS, Birsinghpur.

(Action: CPCB, MPPCB and Sanjay Gandhi TPS, MPPGCL)

- xiv. Compliance verification to be carried out in regard to ash utilization levels of M/s Jaypee Nigrie STPP, which was reported at 89 % in FY 2023-24 as against the compliance cycle of 100% utilisation, as prescribed under Ash Utilisation Notification, 2021.

(Action: CPCB)

- xv. Railway Board may be communicated for expeditious implementation of action plans in respect of pollution control measures at the railway sidings of ECR and WCR in Singrauli and Sonbhadra Region. Status in this regard may be presented during the next meeting of the Mission.

(Action: CPCB)

- xvi. IIFM may be requested to communicate to Hindalco industries for initiation of backfilling of mine voids of abandoned stone quarries with fly ash and red mud in Dalla region based on pilot study conducted by IIFM in association with Aluminium Association of India (AAI) and State Forest Department, Govt. of U.P.

(Action: CPCB)

- xvii. Stipulation of conditions for stabilization of mine voids filled with fly ash and restoration of biodiversity.

(Action: CSIR-NEERI)

- xviii. Inclusion of stabilization conditions formulated by NEERI for fly ash dumpsites as part of Environmental Clearance of TPPs, Coal and non-coal mines.

(Action: CPCB)

- xix. Commencement of backfilling of mine voids of abandoned stone quarries in Dalla region with fly ash and red mud under as per the DPR submitted by IIFM under the pilot study.

(Action: Hindalco Industries Ltd, Renukoot)

- xx. Submission of action plan and timelines for commencing backfilling activities in the allotted pit of Gorbi mine. Action plan shall also include steps to be taken for backfilling activities and status of actual utilization target. CTO to be obtained from MPPCB and initiation of backfilling activities to be undertaken. Action taken report in this regard shall be submitted to CPCB/Concerned SPCB.

(Action: NTPC Vindnyanchal)

- xxi. CSIR-NEERI's expertise may be leveraged for stabilizing and ecologically rejuvenating ash dumpsites through bamboo plantation or suitable site-specific plant species within the stipulated timeline under Ash Utilization Notification, 2021. NEERI may be involved in the consultative meetings with concerned stakeholder for implementation of stabilization or rejuvenation technologies/models developed by them. A list of fly ash dumpsites stabilized by TPPs and actions taken may be shared with SPCBs and CPCB. Coal mines to prioritize stabilization of mine voids filled with ash, focusing on biodiversity restoration.

(Action: All TPPs and Coal mines)

- xxii. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd, 3rd, 4th, 5th and 6th meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the

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website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

Annexure**List of Participants**

1. Smt. Leena Nandan, Secretary, EF&CC- Chairperson
2. Shri Tanmay Kumar, Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Shri Bharat K Sharma, Member Secretary, CPCB
5. Shri Marapally Venkateshwarlu, Director, Ministry of Coal
6. Shri H.K. Sharma, Director (Technology), MPPCB
7. Shri R.K. Gupta, S.E., MPPCB
8. Shri Sanjeev Kumar Singh, MS, UPPCB
9. Shri Umesh Kumar Gupta, RO, Sonbhadra, UPPCB
10. Shri Nazimuddin, Scientist F, CPCB
11. Shri N. Subrahmanyam, Scientist E, MoEF&CC
12. Shri Mohammed Niyazi, Dir. (S&T), DGMS
13. Shri Satish Kumar, Director, Ministry of Power
14. Shri Manish K. Maindiratta, Regional Controller of Mines, IBM, Ministry of Mines
15. Shri P. N. Sharma, CCOM, Indian Bureau of Mines, Ministry of Mines
16. Shri Ajay Jha, Director/ EnHM, Railway Board
17. Shri Jasbir Singh, Dy. Director, M/o Railways
18. Shri Abhishek Vishal, DTM Chopar, M/o Railways
19. Shri Sanjay Gupta, Dy CEM (FM), Railways
20. Shri Neeraj Pathak, SCI, Railways
21. Shri S. K. Tanti, GEnHM, ECR, Indian Railways
22. Shri Ajit Kumar, AEnHM /DHN ECR, East Central Railways
23. Shri Utkarsh Tripathi, DMO, UP-DGM
24. Shri Praveen Gupta, Member (Thermal), CEA

25. Shri Kamal Kumar Jangid, Director, CEA
26. Shri P. S. Mohan Kumar, Deputy Director, CEA
27. Shri Manoj Kumar Choudhary, AD-1, CEA
28. Shri Aman Khare, Dy. Director, CEA
29. Shri Ashwini Kr. Tripathy, Dir. (Tech), UPRVUNL
30. Shri Aringrah Ravi, S.E., UPRVUNL
31. Dr. Vijay Prakash, ED (Env.), NTPC
32. Shri G. Rajashekar, GM (AMG), NTPC
33. Shri Ashwani Tyagi, DGM (Ash Mgt.), NTPC
34. Dr. Lal Singh, Principal Scientist, NEERI, Nagpur
35. Shri Parveen Enlomia, Sr. Manager, Noida Authority
36. Shri Sunil Prasad Singh, DT, NCL (Kaml kunarCIL)
37. Shri R. N.. Shukla, AVP. Env. ESG, Adani Power
38. Ms. Khushi Parekh, Ass. Manager, Mahan Energen Ltd
39. Shri S.K. Jain, Executive Engineer, MPIDC, Bhopal
40. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
41. Shri Manoj Pradhan, Vice President, Reliance Power Ltd.
42. Shri Amit Soni, Head-Env, Sasan Power Ltd.
43. Shri Himanshu Verma, Sr. Manager (HSE), Lanco Anpara Power Ltd.
44. Shri Vivek Gupta, Sr. G.M., Grasim Industries Ltd., Renukoot
45. Dr. Vinay Kumar Yadav, AGM (Environment & Sustainability), Grasim Industries Ltd., Renukoot
46. Shri D. K. Sharan, A.E, UPPWD, Ghaziabad, U.P.
47. Shri Ravikant yadav, Chief Chemist, MPPGCL
48. Shri Prabhat Yadav, Manager (Civil), UPSIDA
49. Dr. Bhanendra Singh, ACF Renukoot Forest Division UP, UP Forest Dept.

50. Shri Sanjay Selot, S. E., SGTPS, MPPGCL
51. Shri S. K. Singhai, SE (Civil), MPPGCL
52. Shri Rehana Beg, Resident Engineer, MPPGCL
53. Shri Ankur Varma, AM, SPL
54. Shri Vinay Ramaiya
55. Shri Durgananda Jha, SRF, CPCB

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F. No. 11/3/2018- HSMD
Government of India
Ministry of Environment, Forest & Climate Change
(HSM Division)

Indira Paryavaran Bhawan
Jor Bag Road, Aliganj
New Delhi - 110003

Date: 1st January, 2025

OFFICE MEMORANDUM

Sub.: Minutes of the eighth meeting of 'Fly Ash Management and Utilization Mission' held on 23.12.2024 - reg.

The undersigned is directed to refer the eighth meeting of 'Fly Ash Management and Utilization Mission' held on 23.12.2024 at 11:00 AM at Indira Paryavaran Bhawan, New Delhi to review the status of actions taken based on the decisions made by the Mission in the meeting held on 26.06.2024.

2. In view of the above, minutes of the eighth meeting of 'Fly Ash Management and Utilization Mission' are enclosed herewith.
3. It is requested to kindly furnish the action taken report to Central Pollution Control Board.

This issues with the approval of the Competent Authority.

Encl.: As stated

Yours sincerely,

N. Subrahmanyam
01/01/2025

(N. Subrahmanyam)
Scientist E

E-mail: n.subrahmanyam@gov.in
Ph.20819269

To

1. Secretary (Coal), Ministry of Coal, New Delhi
2. Secretary (Power), Ministry of Power, New Delhi
3. Secretary (Mines), Ministry of Mines, New Delhi
4. Chairman, Ministry of Railways (Railway Board), New Delhi
5. Chief Secretary, State of Uttar Pradesh
6. Chief Secretary, State of Madhya Pradesh
7. Chairman, CPCB, New Delhi

8. Additional Chief Secretary/Principal Secretary, Energy, Government of Uttar Pradesh
9. Additional Chief Secretary/Principal Secretary, Energy, Government of Madhya Pradesh
10. Additional Chief Secretary/Principal Secretary, Industries, Government of Uttar Pradesh
11. Additional Chief Secretary/Principal Secretary, Industries, Government of Madhya Pradesh
12. Director General, Directorate General of Mines Safety, Jharkhand
13. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Madhya Pradesh
14. Additional Chief Secretary/Principal Secretary, Environment Department, Government of Uttar Pradesh
15. Chairman, UPPCB, Uttar Pradesh
16. Chairman, MPPCB, Madhya Pradesh
17. District Magistrate, Sonbhadra, U.P. (for stone crushers and all private mines)
18. District Magistrate, Singrauli, M.P. (for stone crushers and all private mines)
19. Director, CSIR-NEERI, Nagpur
20. CMD, M/s NCL
21. CMD, M/s NTPC Limited
22. CMD, M/s Lanco Anpara Power Pvt. Ltd.
23. CMD, M/s Hindalco Industries Ltd.
24. CMD, M/s UPRVUNL
25. CMD, M/s Grasim Industries Limited, Chemical Division, Renukoot, Sonbhadra
26. CMD, M/s Birla Carbon India Pvt. Ltd., Renukoot, Sonbhadra
27. CMD, M/s Sasan Power Limited, Singrauli
28. CMD, M/s APMDC Ltd., Singrauli
29. Industries, Mines and Stone crushers concerned in Singrauli and Sonbhadra Region.

Copy to:-

1. Dir.(AR)
2. PSO to Secretary (EF&CC)
3. PPS to AS(NPG)
4. PPS to JS(VPM)
5. SO, HSMD

Minutes of the 8th meeting of Fly Ash Management and Utilization Mission held on 23.12.2024 at 11:00 AM

The eighth meeting of 'Fly Ash Management and Utilization Mission' was convened on 23rd December, 2024 at 11:00 AM under the chairpersonship of Secretary, EF&CC, to review the status of actions taken based on the recommendations/decisions made by the Mission in the meeting held on 26.06.2024. The list of participants is enclosed as **Annexure**.

2. At the outset, Secretary, EFCC welcomed all the participants. Special Secretary, MoEF&CC briefed about the decisions taken by the Mission in last meeting held on 26.06.2024.

3. A presentation was made by the Anpara Thermal Power Project (UPRVUNL) on status of implementation of NEERI technologies/ expertise for stabilizing ash dykes through bamboo plantation at the ash ponds of thermal power plants of UPRVUNL. The following details were presented:

- i. Anpara Thermal Power Project (2,630 MW) consumes around 40,000 MT of coal daily (132.0 LMT/ year). The ash generation from Anpara Thermal Power Project is 13,600 MT/day (45.0 LMT/year), out of which bottom ash is 2720 MT/day (9.0 LMT/year) and fly ash is 10,880 MT/day (36.0 LMT/year).
- ii. The fly ash generated is utilised in road projects, filling up of low lying areas, mines/ quarries, and in bricks & tiles industries. The details of generation and utilization of fly ash for Anpara TPS has been given below:

Financial Year	Ash Generation (LMT)	Ash Utilization (LMT)	% Ash Utilization
2022-23	43.52	0.82	1.88
2023-24	41.59	21.49	51.67
2024-25 (up to Nov., 2024)	49.45	12.15	24.54

- iii. 5.51 lakh MT pond ash has been disposed in Pipri low lying area in the FY 2024-25. Pond ash of 20 lakh MT and 10 lakh MT has been proposed to be disposed at low lying area and Gorbi Mines, respectively, in FY 2024-25.
 - iv. Anpara and Obra TPS is in process for developing railway infrastructure for transportation of ash in PPP Model. The consultant has submitted DPR for installation of DFAES and development of railway infrastructure for ash evacuation system through railway. Currently, RFP documents and concessionaire agreement are being prepared for inviting bids from interested bidders.
 - v. DM Singrauli has been requested to issue NoC for transportation of ash to Gorbi mines. Application for Consent to Operate (CTO) for transporting fly ash to Gorbi mines has been submitted to MPPCB.
 - vi. DM, Singrauli informed that NoC for transportation of fly ash from Anpara TPS to Gorbi mines will be issued in two days.
 - vii. MPPCB emphasized that to obtain the CTO, the ash dyke currently being used for fly ash disposal must be closed, and a permanent pipeline for fly ash transfer to Gorbi mines must be established, as transporting it by road could create more pollution.
 - viii. Miyawaki Plantation has been done for 50% area of the abandoned ash pond (Saddle dam-2) in Village Belwadah (near the current ash pond). Development of green belt through bamboo plantation will be done on the remaining 50% of the area of the abandoned ash pond (Saddle dam- 2).
 - ix. Reconnaissance survey has been done by NEERI in regard to implementation of NEERI technologies/ expertise for stabilizing abandoned ash dyke through bamboo plantation.
 - x. Ash/ soil sampling will be sent to NEERI for selection and screening of bamboo species. Plantation of bamboo species will be done as per NEERI's advice.
4. **Representative from Ministry of Power** highlighted that a meeting had been conducted regarding the compilation of legacy dumpsites which are being stabilized

by TPPs. 105 TPPs have responded and 5 TPPs are in the process of legacy dumpsite stabilization.

5. **Representative from West Central Railway (WCR)** stated that there are three Goods Sheds/ railway sidings of WCR in Singrauli Region: Bargawan Railway Coal Siding (BRRB), Gajara Bahara Goods Shed (GBGG) and Gondwali Coal Siding (GWCB). All the compliances regarding the implementation of air pollution control measures Gajra Bahara Goods Shed have been completed.

6. **Representative from East Central Railway (ECR)** gave a presentation on status of implementation of air pollution control measures at the Goods Sheds/ railway sidings at Singrauli region. The following points were highlighted during the meeting:

- i. There are three Goods Sheds/ railway sidings of ECR in Singrauli Region: SPUR III and X (SGRL), and MAHDEIYA (MHDA).
- ii. The status of compliance of directives of pollution control measures at the Goods Sheds/ railway sidings have been given below:

Directive	Status
Construction of wind breaking wall of sufficient height on both sides of railway siding	Complied 20 feet height of concrete boundary wall along with fencing/ protection screen/ GI sheet has been constructed.
Heap height of coal stock should be lesser than the height of the boundary wall	Complied
The occupier shall develop three tier plantations all along the boundary wall and other available spaces and shall continue enhancing its plant density and biodiversity.	Small and big trees are available in goods trees. Sampling plantation: <ul style="list-style-type: none"> • FY 2022-23: 50 saplings at SPUR and 50 saplings at MAHDEIYA • FY 2023-24: 50 saplings at SPUR and 100 saplings at MAHDEIYA

	<ul style="list-style-type: none"> FY 2024-25: 400 saplings at SPUR and 450 saplings at MAHDEIYA <p>Further plantation will be done to enhance green cover in the sidings.</p>
The occupier shall construct garland drain all along the boundary wall with de-silting pit.	Work sanctioned by Railway Board, it will be completed shortly.
To install fixed type water sprinklers in the railway siding.	<p>SPUR – III & X</p> <ul style="list-style-type: none"> Two number water boring of 8 inch diameter & 100 m depth done for water sprinkling system Installation of pipeline and sprinkler heads will be expedited. <p>MAHDEIYA (MHDA)</p> <ul style="list-style-type: none"> One number water boring of 8 inch diameter and 100 m depth done for water sprinkling system. Installation of pipeline and sprinkler heads will be expedited.
Continuous sprinkling of water for control of fugitive emissions.	Water sprinkling being done by water tankers.
Coal transportation vehicles must be covered with tarpaulin sheet.	Complied
The occupier shall construct rain water harvesting and ground water recharge system.	Work sanctioned by Railway Board, it will be completed shortly.
Construction of approach road	Approach road has been constructed in these sidings.
Construction of Wharf	Complied

7. It was mentioned that currently the coal is being handled manually at the Goods Sheds/ railway sidings of ECR, WCR and NCL. Ideally, there should be coal handling plants, with conveyer belts and silos to load the coal.

8. **Representative from Ministry of Coal** highlighted the following points regarding the allocation of mine voids:

- i. The following four mine voids have been allocated to different TPPs (including NTPC) for the purpose of fly ash filling:
 - Gorbi Pit 1, NCL allocated to NTPC (Singrauli)
 - Gorbi Pit 2, NCL Allocated to NTPC Vindhyachal and NTPC (Singrauli)
 - Krishnashila, NCL allocated to NTPC (Singrauli)
 - Gorbi mine (Pit-3),NCL allocated to Anpara Thermal Project-UPRVUNL
- ii. At present, there are no mine voids available at NCL. For advance allocation mines approaching for closure in 3-5 years, system has been established through dissemination of relevant SoPs, directing coal companies to submit a list of mines suitable or available for fly ash disposal, along with those expected to be available over the next 03 years, to the Ministry of Coal by the 10th of each month. These details will be shared with CEA for dissemination to TPPs so that any interested party can apply. Subsequently, the matter will be considered in the Central Level Working Group and allocation of mines will then take place.
- iii. As on date, 36 mine voids have been allocated, and fly ash filling of around 300 lakh m³ has taken place.
- iv. With regard to mixing of fly ash with OB in operational mine voids, the Central Level Working Group, in consultation with the stakeholders, has concluded that mixing of OB and flyash will not be safe.

9. **Ministry of Mines** has submitted the following status in regard to the allocation of mines for filling of fly ash:

- i. The earlier provided SOPs (vide OM dated 19.03.2024) for allocation for mines in respect of safety and administrative related matters have been modified by IBM.
- ii. A standardized format for seeking NOC by TPPs from concerned authorities for allocation of mine voids has been prepared by IBM.

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- iii. A list of additional 38 mining areas (full area: 33 & partial area: 5) surrendered to State Government has been shared with M/o Power.

10. A presentation was made by MPPGCL regarding the inspection of ash pond of Sanjay Gandhi Thermal Power Station (SGTPS), Birsinghpur to ascertain localized/ terrain specific solution for evacuation of current ash from operational ash dyke of SGTPS (total installed capacity of 1340 MW), Birsinghpur. The following details were highlighted during the presentation:

- i. Team of officials from CPCB, MPPCB and representatives from MPPGCL had carried out the site inspection in September 2024.
- ii. Ash dyke-II, which is the only active ash pond, is surrounded by hills on three sides, having only a single compartment, non-uniform ash deposition on undulating pond bottom, creating operational challenges.
- iii. The ash is currently being deposited at a single location at a higher elevation, instead of at the section of the ash pond near the road where fly ash evacuation actually takes place.
- iv. Experts have indicated that fly ash evacuation cannot happen unless the roadside section of the ash pond is filled.
- v. Lifting of all deposited ash is not possible till ash is filled up to the level (elevation of 479 m) and two compartments are created.
- vi. Experts have recommended for improvement of the ash disposal system, and partitioning of the existing ash pond and creating a levelled platform at an elevation of 479 meters as a viable solution for ash evacuation.

11. A presentation was made by the Madhya Pradesh Pollution Control Board on the progress of implementation of action plans and environmental guidelines for stone crushing units published by CPCB for control of air pollution, and mapping of roads used for coal/ash transportation with responsible agencies to control air pollution. The following details were presented:

- i. Utilization fly ash generated from the 15 TPPs of Madhya Pradesh has increased from 55.6% in the FY 2021-22 to 74% in FY 2022-23 and 95% in FY

2023-24. Fly ash utilization during the current year (upto November, 2024) is 85%.

- ii. Status of implementation of action plan for fly ash utilisation generated from 05 TPPs (12140 MW) in Singrauli Region was presented.

TPP name	FY 2021-22		FY 2022-23		FY 2023-24		FY 2024-25 (up to Nov 24)	
	Ash Generation (LMT)	Ash Utilisation (%)	Ash Generation (LMT)	Ash Utilisation (%)	Ash Generation (LMT)	Ash Utilisation (%)	Ash Generation (LMT)	Ash Utilisation (%)
	NTPC Vindhyachal (4760 MW)	82.38	53.05	76.64	37.31	66.83	56.22	43.84
Sasan Power Limited (3960 MW)	53.47	52.35	45.99	109.5	48.98	100.7	36.37	32.17
Mahan Energen Limited (1200 MW)	8.36	25.46	9.08	100.2	14.27	103.72	11.06	81.65
Jaypee Nigrie Super TPP Vill. Nigrie, Singrauli (1320 MW)	15.79	89.55	14.55	100.09	18.06	89.17	11.41	107.0
Hindalco Industries Ltd, Mahan Aluminium (900 MW)	11.54	84.55	11.82	99.6	10.82	131.14	7.59	103.76
Total	171.54	56.96	158.08	70	158.96	83	110.27	59.21

- iii. 15 thermal power plants (TPPs) in Madhya Pradesh have utilized 868.71 lakh LMT of ash in from FY 2021-22 to FY 2024-25 (upto Nov 24). This includes

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181.7 LMT (20.9%) for road & other construction work, 38.79 LMT (4.5%) for bricks production, 157.19 LMT (18.1%) for filling low-lying areas, 229.2 LMT (26.4%) supplied to cement industries, and 261.83 LMT (30.1%) used for backfilling in abandoned mines, overburden (OB) mixing, stone quarry, and dyke raising activities.

- iv. 02 TPPs in M.P. have utilized less than 80% ash in the FY 2024-25 (up to Nov 24) namely, NTPC Vindhyachal, Singrauli (55.82%) and Sasan Power Limited, Singrauli (32.17%). Sasan Power Limited explained that the low ash utilization rate during the FY 2024-25 was primarily due to the monsoon season, during which the DGMS prohibits the mixing of ash with OB, and highlighted that they have sought permission from MPPCB for dumping of ash in low-lying area.
- v. The following activities from action plan of various TPPs in Singrauli region have been reported to be under progress:
 - a. M/s NTPC Vindhyanchal STPP, Singrauli (13 units)
 - FGD installation completed in 2 units and to be completed in 11 units by April 2025
 - NO_x emission control measures completed in 7 units, not completed in 6 units
 - Inventorization study for industries operating around the Rihand reservoir: Contract awarded to NEERI for 2 years in Feb 2024, study in progress
 - b. M/s Sasan Power Limited
 - FGD installation for SO₂ by Dec. 2026. Vendor being finalized.
 - Permanent sprinkling system for 4 ash dykes: 1st phase completed (1.6 km out of 6.5 km), 2nd and 3rd phase to be completed by December 2025 and March 2025, respectively
 - Pipeline for fly ash transportation to its mine: 2 km pipeline procured
 - Cleaning of fly ash from Gawaiya (2 km)/ Garra nallah (in patches)- Under progress

- c. M/s Mahan Energen limited
- FGD installation for SO₂ by December 2026. About 10% of civil work has been completed.
 - Coal transportation by road: Forest clearance pending.
 - Development work of railway siding for fly ash: No substantial progress
- d. M/s Hindalco Industries Ltd.: FGD installation for SO₂ in Unit-1,2,3,4,5 by Dec. 2026 and construction of RCC road by March 2025.
- e. Jaypee Nigrie STPP: Installation of FGD installation for SO₂ by December 2026.
- vi. The following activities from action plan of various coal mines in Singrauli region have been reported to be under progress:
- a. NCL, Khadia Project
- Fly ash utilization in OB dump: Not complied (timeline not given)
 - Coal handling plant required for 15 MTPA: 10 MTPA completed. Gap of 5 MTPA.
 - Transportation of coal through rail mode: Wharf wall under construction- 04 MTPA. Gap of 1 MTPA.
 - Carrying capacity of Mine & traffic study by January, 2025
 - Installation of Automatic wheel washing system by February, 2025
- b. NCL, Amlori Project
- Fly ash utilization in OB dump: Not complied (timeline not given)
 - Coal handling plant required for 15 MTPA: 12 MTPA completed. Gap of 3 MTPA.
 - Transportation of material by rail/conveyor belt: 12 MTPA completed, Gap of 3 MTPA.
 - Installation of Automatic wheel washing system by February, 2025
 - Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

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c. NCL, Nigahi

- Fly ash utilization in OB dump: Not complied (timeline not given)
- Coal handling plant required for 22.5 MTPA: 15 MTPA completed, Gap of 7.5 MTPA.
- Transportation of material by rail/conveyor belt: 12 MTPA completed, Gap of 3 MTPA.
- Construction of pakka roads of 3.0 km by March, 2025.
- Installation of Automatic wheel washing system by June, 2025
- Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

d. NCL, Jayant Project

- Fly ash utilization in OB dump: Not complied (timeline not given)
- Coal handling plant required for 30 MTPA: 25 MTPA completed, gap of 5 MTPA
- Transportation of coal through rail mode: 25 MTPA completed, gap of 5 MTPA
- Deployment of 8 nos. of fixed type fog cannon by March, 2025
- Fixed type water sprinkler along haul road till CHP, Rly siding and OB dump area by March, 2026
- Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

e. NCL, Block-B Project

- Fly ash utilization in OB dump: Not complied (timeline not given)
- Coal handling plant of 4.5 MTPA under progress (40% completed)
- Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)

f. NCL, Dudhichua Project

- Fly ash utilization in OB dump: Not complied (timeline not given)

- Installation of Automatic wheel washing system by December, 2024.
 - Carrying capacity of Mine & traffic study by Jan., 2025 (under progress through CMPDIL)
 - Study of existing EPT (Oversight committee observation): Not completed
- g. NCL, Bina Extension
- Fly ash utilization in OB dump: Not complied (timeline not given)
 - Additional CHP of 9.5 MPTA under progress (91% completed)
 - Upgradation of ETP: Under trial (expected to be completed by December, 2024)
 - Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)
- h. NCL, Jhingurda
- Fly ash utilization in OB dump: Not complied (timeline not given)
 - Coal handling plant required for 4 MTPA: Not complied (gap of 5 MTPA)
 - Installation of Automatic wheel washing system by December, 2025
 - Carrying capacity of Mine & traffic study by January, 2025 (under progress through CMPDIL)
- i. APMDC Ltd.-Sulyari Open Cast Project
- Fly ash utilization in OB dump: Not complied (timeline not given)
 - Coal handling plant required for 5 MTPA: Not complied (gap of 5 MTPA)
 - Construction of railway siding by December, 2025
 - Crusher and in-pit belt conveyor with mist type sprinkler by December, 2025
 - Installation of Automatic wheel washing system: Not complied (timeline not given)
 - CWQMS in ETP/STP (EC condition) by January, 2025

- j. Sasan Power Limited (Moher & Moher Amlohri extension coal mine)
 - Deployment of mist cannons to control air pollution: Under progress
 - Rehabilitation and resettlement of affected people by March, 2025
- k. Jaiprakash Power Ventures Ltd., Amelia (North) Coal Mine
 - Fly ash utilization in OB dumps: Not complied (timeline not given)
 - Plantation on dump area towards Kanchan river: Partially complied (50% remaining)
- l. THDC India Ltd., Amelia Coal Block (New mine)
 - Fly ash utilization in OB dumps: Not complied (timeline not given)
 - Coal handling plant required for 5.60 MTPA by June, 2025 (90% completed)
 - Construction of permanent railway siding: Not complied (timeline not given)
- vii. The following activities from action plan of coal handling Goods Sheds/ railway sidings in Singrauli region have been reported to be under progress:
 - a. ECR, Spur III & X
 - Installation of coal handling system: Not complied (timeline not given)
 - Water sprinkling system or tankers: Not complied (timeline not given)
 - Drainage facility: Not complied (timeline not given)
 - Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Not complied (timeline not given)
 - b. ECR, Mahedaiya
 - Installation of coal handling system: Not complied (timeline not given)
 - Water sprinkling system or tankers: Not complied (timeline not given)
 - Drainage facility: Not complied (timeline not given)

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- Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Partially complied (timeline for completion not given)
- c. WCR, Gondawali
- Installation of coal handling system: Not complied (timeline not given)
 - Wind breaking wall of 1000 m: 500 m completed, 500 m remaining
 - Water sprinkling system or tankers: Not complied (timeline not given)
 - Drainage facility: Not complied (timeline not given)
 - Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Not complied (timeline not given)
- d. WCR, Bargawan
- Installation of coal handling system: Not complied (timeline not given)
 - Wind breaking wall of 1000 m: 600 m completed, 400 m remaining
 - Water sprinkling system or tankers: Not complied (timeline not given)
 - Drainage facility: Not complied (timeline not given)
 - Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Not complied (timeline not given)
- e. WCR, Gajra Bahra
- Installation of coal handling system: Not complied (timeline not given)
 - Pucca circulating handling area with drainage facility: Not complied (timeline not given)
 - Green belt around the coal siding area: Partially complied (timeline for completion not given)
- viii. Out of the 56 stone crushers, 12 stone crushers have been shut down. 44 stone crushers have installed Air Pollution Control Equipment (APCE).

- ix. CEPI score 43.4 was observed during monitoring conducted by MPPCB, in consultation with the Regional Office of CPCB, in the period of May to June, 2024.
- x. Mapping of roads used for coal/ ash transportation with responsible agencies to control air pollution was presented for 5 different routes for coal/ash transportation.
- xi. Out of the 127 million tonnes of coal production, 109.81 million tonnes (86%) is being transported by rail/ merry-go-round and 16.62 million tonnes (16.6%) is being transported by roads. 35 million tonnes/annum CHP is under construction and installation.

12. A presentation was made by the Uttar Pradesh Pollution Control Board on the progress of implementation of action plans and environmental guidelines for stone crushing units published by CPCB for control of air pollution. The following details were presented:

- i. The status of fly ash generation and utilization by 06 TPPs in Sonbhadra, U.P. were reported as below:

Financial Year	Ash Generation (LMT)	Ash Utilization (LMT)	% Ash Utilization
2021-22	151.1	57.9	38.3
2022-23	161.9	56.8	35.1
2023-24	160.7	101.8	63.3
2024-25 (up to Nov., 2024)	219.05	106.2	48.5

- ii. Action plans have been submitted by 06 TPPs, 03 industries, 05 coal mines (NCL), and stone crushers for implementation of air pollution control measures. The following activities form action plan of various industries in U.P. have been reported to be under progress:

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- a. M/s NTPC SSTPS, Shaktinagar to install FGD in all 7 units and expand AWRS capacity by March, 2026, and DAES#1 and U#7 is in commissioning is expected to be completed by March, 2025.
- b. In M/s NTPC Rihandnagar SSTP, commissioning of FGD and DAES (Stage I) is expected to take place by 31.12.2026 and 31.12.2025, respectively. Cold Fog Dust Suppression (CFDS) System in Stage I and CFDS Stage II were commissioned in April, 2024 and November, 2024, respectively.
- c. M/s MEIL Anpara Energy Limited (formerly M/s Lanco Anpara Power Limited, Anpara) - FGD installation by December, 2025
- d. M/s U.P. Rajya Vidyut Utpadan Nigam Ltd. (Anpara A, B & D TPS), Anpara- FGD installation at A, B & D TPS by December, 2026
- e. M/s Hindalco Industries Limited, Renusagar Power Division- FGD installation in Boiler 5 by June, 2025.
- f. M/s U.P. Rajya Vidyut Utpadan Nigam Ltd. (Obra A, B - TPS), Obra- FGD installation by May, 2025, DFAES through railway to be installed by 2026.
- iii. The status of generation and utilization of fly ash was submitted by 06 TPPs. The details have been given below:

TPP name	FY 2023-24			FY 2024-25 (up to Nov 24)		
	Ash Generation (LMT)	Target Ash Utilization (%)	Actual Ash Utilization (%)	Ash Generation (LMT)	Target Ash Utilization (%)	Actual Ash Utilization (%)
UPRVUNL Obra TPP	14.4	102	95.25	112.3	105	31.82
UPRVUNL Anpara TPP	41.6	69	51.67	32.04	97.89	17.49
NTPC Rihand	42.2	67	80.42	27.8	101	82.85
NTPC Shaktinagar	30.2	-	40.44	24.1	140.8	103.82
MEIL Anpara Energy Limited	18.1	-	23.69	13.23	-	48.82

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Hindalco Industries Limited, Renusagar Power Division	14.1	-	114.67	9.6	-	106.31
Total	160.6	-	63.3	219.1	-	48.5

- iv. Ash utilization was 56.817 LMT in FY 2022-23, 101.822 LMT in FY 2023-24 and 106.145 LMT in FY 2024-25 (up to Nov 2024).
- v. The status of implementation of action plan by the mining projects along with the timelines was presented. The details of the work under progress/ remaining work have been given below:
- a. M/s NCL Ltd., Bina Project, Bina- Construction of new CHP (9.5 MTPA) by June, 2025 (91% of the work completed); upgradation of ETP & STP by December, 2024 (99% of the work completed); and carrying capacity of mine and traffic study (EC condition) by December, 2024 (work under progress).
 - b. M/s NCL, Dudhichua Project- Tyre washing system/mechanism of Coal transporting vehicles on Road by December, 2024 (99% of work completed).
 - c. M/s NCL Ltd., Kakri Project- Tyre washing system/mechanism of Coal transporting vehicles on Road by February, 2025 (25% of work completed); construction of wharf wall/ railway siding: Platform work completed and rail connectivity to wharf wall is to be done by ECR.
 - d. M/s NCL Ltd., Khadia Project
 - ETP upgradation under progress
 - Tyre washing system/mechanism for Coal transporting vehicles on Road by December, 2024. Tender under progress.
 - Construction of Wharf wall / Railway Siding under progress. Rail connectivity to wharf wall to be done by ECR railway siding.
 - e. M/s NCL Ltd., Krishnashila Project- Construction of sedimentation ponds

- vi. The status of implementation of action plan by other industries was presented. The details of the work under progress/ remaining work have been given below:
- a. M/s Grasim Industries Limited Chemical Division, Renukoot – Miyawaki Plantation inside the premises has been done and approximately 63% of green belt has been done inside the premises. Miyawaki Plantation outside the plant premises will be done.
 - b. M/s Birla Carbon India Pvt. Ltd., Renukoot – Miyawaki Plantation has been completed in 150 m² . Miyawaki Plantation outside the plant premises will be done.
 - c. Aluminium Smelter- M/s HINDALCO Industries Ltd., Renukoot :
 - Tri-party agreement between IIFM Bhopal, UP Forest Department and AAI done on 18.08.2023 to conduct a pilot study for assessing the impact of backfilling of abandoned quarry in Dalla region of approx.. 0.5 hectare area.
 - IIFM issued permission letter on 25.11.2024 to start the execution job.
 - IIFM has requested for concurrence from CCF, Mirzapur for void dewatering, filling of void by OB/ native soil and construction of well.
- vii. The status of implementation of 'Environmental guidelines for stone crushing units' published by CPCB for control of air pollution was presented. The details have been given below:
- a. UPPCB published a press release in newspaper dated 20.11.2024 directing stone crushing units of Dalla, Bili Markundi, Obra region to ensure non-operation of stone crushing unit from 5:00 PM to 10:00 AM and to ensure proper operation of the installed air pollution control systems. Stone crushing units have also been directed to reduce vehicular dust emission by regular water sprinkling on road.
 - b. Joint Committee has been constituted by District Magistrate dated 21.11.2024 for regular monitoring of air pollution control measures installed at the stone crushing units.

- c. A meeting of the Joint Committee was held on 11.12.2024 to discuss implementation of GRAP and review the compliance of status of Action Plan under NCAP.
 - d. District Magistrate has directed all TPPs and coal mines to reduce road dust during ash/ coal transportation by ensuring the usage of covered vehicles and regular water sprinkling along with road dust sweeping.
 - e. Regular inspections have been carried out by UPPCB and action has been taken against the non-complying units.
 - f. The level of PM10 in FY 2024-25 (during the months July, August, Sep, Oct, Nov) in ambient air near Dalla/ Obra stone crusher area is higher than the previous three financial years.
 - g. UPPCB is monitoring the ambient air quality at Anpara Station, Sonbhadra through manual monitoring station under NAMP. The level of PM10 has reduced in the FY 2024-25 (up to November, 2024) ($140 \mu\text{g}/\text{Nm}^3$) compared to FY 2023-24 ($166 \mu\text{g}/\text{Nm}^3$). The level of SO_2 and NO_2 have remained almost constant at $17 \mu\text{g}/\text{Nm}^3$ and $24 \mu\text{g}/\text{Nm}^3$, respectively. AQI has reduced (AQI: 127) in the FY 2024-25 compared to the FY 2023-24 (AQI: 144).
- viii. The status of mapping of roads used for coal/ ash transportation with responsible agencies to control air pollution was presented. The summary of transportation of coal via various different modes by NCL coal mines has been given as below:
- a. For FY 2024-25 (up to November 2024), the transportation modes for NCL coal mining projects are as follows:
 - **NCL Bina:** 72.4% by rail, 21% by road, and 6.6% by belt pipe conveyor.
 - **NCL Khadia:** 73.54% by rail and 26.46% by road.
 - **NCL Krishnashila:** 59.38% by rail, 29.95% by road, and 10.67% by belt pipe conveyor.
 - **NCL Kakri:** 61.18% by rail and 38.82% by road.
 - **NCL Duddhichua:** Currently, there is no mining activity in the Sonbhadra region.

- a. For the M/s NCL Bina project, the percentage of rail usage as the mode of transportation remains constant at 72% from FY 2023-24 to FY 2024-25 (up to Nov., 2024). Meanwhile, road transportation has decreased from 28% in FY 2023-24 to 21% in FY 2024-25, and the use of ropeway/belt pipe conveyor has risen from 0% in FY 2023-24 to 6.6% in FY 2024-25.
 - b. For the M/s NCL Krishnashila project, the percentage of rail usage as the mode of transportation has increased from 53% from FY 2023-24 to 59% in FY 2024-25 (up to Nov., 2024), road transportation has increased from 18% in FY 2023-24 to 30% in FY 2024-25, and the use of ropeway/belt pipe conveyor has decreased from 29% in FY 2023-24 to 11% in FY 2024-25.
 - c. For the M/s NCL Kakri project, the percentage of rail usage as the mode of transportation has increased from 49% from FY 2023-24 to 61% in FY 2024-25 (up to Nov., 2024), and road transportation has decreased from 51% in FY 2023-24 to 39% in FY 2024-25.
 - d. For the M/s NCL Khadia project, the percentage of rail usage as the mode of transportation has decreased from 75% from FY 2023-24 to 74% in FY 2024-25 (up to Nov., 2024), and road transportation has increased from 25% in FY 2023-24 to 26% in FY 2024-25.
 - e. Out of the 60 million tonnes of coal production, 44.3 million tonnes (74%) is being transported by rail/ merry-go-round, 13.49 million tonnes (22.5%) is being transported by roads and 2.68 million tonnes is being transported by Belt Pipe Conveyor. 18.5 million tonnes/annum CHP is under construction and installation.
13. After detailed deliberations, the **following decisions were made**:
- i. Anpara TPS and UPPCB to address the issue of fly ash utilization during FY 2024-25 and send the report to the Ministry with arrangements to be made, the conditions to be imposed and the timelines. The report will also include the challenges related transfer of fly ash to Gorbi Mines.

(Action: UPPCB and Anpara TPS)

- ii. NoC from DM, Singrauli and CTO by MPPCB for transportation of fly ash from Anpara TPS to Gorbi Mines may be granted, subject to the required conditions and timelines for transportation of fly ash.

(Action: DM, Singrauli and MPPCB)

- iii. SOP may be developed for implementation of NEERI technologies for stabilizing the abandoned ash dyke through bamboo plantation.

(Action: CPCB & NEERI)

- iv. Anpara TPS shall send a request to NEERI for the proposal on implantation of NEERI technologies/ expertise for stabilizing abandoned ash dyke through bamboo plantation. NEERI shall send the proposal to Anpara TPS within a week on receiving the request from Anpara TPS to award and initiate the work.

(Action: Anpara TPS and NEERI)

- v. ECR and WCR shall share geotagged photos with CPCB, of the air pollution control measures taken at railway sidings/ Goods Sheds in the Singrauli and Sonbhadra regions.

(Action: ECR and WCR)

- vi. ECR shall implement the air pollution control measures taken at the Goods Sheds / railway sidings. A certification from NEERI to be obtained that all dust control measures have been implemented and complied with. Any issues identified during the certification process will be addressed accordingly. This could serve as a model for air pollution control measures at coal-handling Goods Sheds/ railway sidings across Indian Railways.

(Action: ECR and NEERI)

- vii. CPCB shall create provisions on the online portal for uploading the locations, geotagged photos and short videos of the legacy ash dumpsites by TPPs and air pollution control measures taken at railway sidings by ECR and WCR.

(Action: CPCB)

- viii. Railway Board shall prepare action plan regarding the installation of automated coal handling mechanism at railway sidings.

(Action: Railway Board)

- ix. ECR and WCR shall make a presentation in the next Mission meeting covering all the stages of coal handling and transportation at the Goods Sheds/ railway sidings, including the details regarding the dust control measures at each stage in the Goods Sheds/ railway sidings.

(Action: ECR and WCR)

- x. Letters to be sent to the General Manager, West Central Railway Zone and East Central Railway Zone regarding the non-compliance of the action plans.

(Action: MoEF&CC)

- xi. CPCB, Ministry of Coal and Ministry of Mines shall work together to develop an GIS based online system for identification and allocation of mine voids, incorporating geotagged locations of both TPPs and mine voids, within 3 months. This information will be made available on the CPCB portal for access by all decision-makers. Additionally, the minutes of the Central Level Working Group meetings will also be made available on the portal.

(Action: Ministry of Coal, Ministry of Mines and CPCB)

- xii. Ministry of Coal shall present the status of coal transportation and installation of CHP/ conveyer belts with original, extended and committed timelines for all the coal mines with the said EC/CTO conditions in the next meeting of the Mission.

(Action: Ministry of Coal)

- xiii. Joint Committee report on ash dyke conditions of MPPGCL to be shared with the power plant. MPPGCL to submit action taken report as per the recommendations of the Joint Committee report and to be submitted to

CPCB and MPPCB. CPCB to examine the recommendations of the Joint Committee report.

MPPGCL shall share the report of the water quality from the toe drain of the Ash Dyke – II of Sanjay Gandhi Thermal Power Station (SGTPS), Birsinghpur with CPCB/ MoEF&CC to ascertain the impact of ash disposal activities on adjacent forest land.

(Action: MPPGCL)

- xiv. CSIR-NEERI shall prepare SOPs on (i) stabilization of ash ponds through plantation of bamboo species to improve biodiversity, (ii) control of pollution around operational ash ponds through plantation of bamboo species, and (iii) stabilization of mine voids filled with fly ash. For the SOP on the stabilization of filled mine voids, NEERI shall work with NTPC, Ministry of Coal, CPCB, UPPCB and MPPCB.

(Action: Ministry of Coal, CPCB, CSIR-NEERI, CPCB, UPPCB and MPPCB)

- xv. CSIR- NEERI to nominate a designated nodal officer to attend the meetings of the Fly Ash Management and Utilization Mission and for handling all related matters, and share the details of the nominated officer with MoEF&CC.

(Action: CSIR-NEERI)

- xvi. Sasan Power Limited, Singrauli, may hire independent experts to examine the technical feasibility and impact study of disposal of fly ash in the low-lying area in a scientific manner. Joint inspection may be done with MPPCB in this regard and the safeguards that can be put into place may be determined.

(Action: Sasan Power Limited, Singrauli and MPPCB)

- xvii. DO letter to be sent to NCL Chairman and Managing Director regarding the gaps in the compliance of the action plans and status of implementation of the action plans.

(Action: MoEF&CC)

- xviii. NCL to share the roles and responsibilities of the in-house environmental engineers appointed by them, and the activities undertaken by them at respective mines.

(Action: NCL)

- xix. Ministry, in coordination with CPCB, MPPCB and UPPCB, shall hold a meeting with the TPPs, coal mines and East/ West Central Railway regarding the status of implementation of the action plans, conditions of EC & CTO within one month. The review shall also include the mapping of the revised timelines as against the actual timelines.

(Action: MoEF&CC, CPCB, MPPCB and UPPCB)

- xx. Stone crushers of all capacities shall take measures to prevent/ suppress fugitive dust emissions from their operation in line with 'Environmental Guidelines for Stone Crushing Units' by CPCB. Status of implementation shall be submitted.

(Action: MPPCB, UPPCB and all stone crushers in Singrauli and Sonbhadra region)

- xxi. Comparison of the CEPI score calculation methods used by CPCB and MPPCB shall be carried out.

(Action: CPCB)

- xxii. Action plan to be prepared, within the next three months, outlining the allocation of responsibilities for construction of different sections of the roads for coal/ash transportation, control of air pollution during coal/ash transportation, components related to DPR preparation and funding. A meeting may be conducted with mining/ coal industrial

associations/agencies and stone crushers to work out the details in this regard.

(Action: MPPCB and UPPCB)

- xxiii. M/o Power and CEA to share the details regarding the number of TPPs in the country, number of TPPs in requirement of stabilization of legacy dumpsites and number of TPPs that have submitted the action plan for stabilization of legacy dumpsites.

(Action: M/o Power and CEA)

- xxiv. All the pending/ ongoing activities in respect of implementation of decisions made during 1st, 2nd, 3rd, 4th, 5th, 6th and 7th meeting of the Mission shall be undertaken and action taken report shall be furnished. Progress to be updated on the website on monthly basis. Necessary formats may be put up on the website to enable all stakeholders to upload the progress online. Login and passwords for all stakeholders to be generated immediately.

(Action: Concerned Ministry/ CPCB/ State Govts./ SPCBs/ Organisation)

14. Meeting ended with a vote of thanks to the Chair.

Annexure I**List of Participants**

1. Smt. Leena Nandan, Secretary, EF&CC- Chairperson
2. Shri Tanmay Kumar, Special Secretary, MoEFCC and Chairman, CPCB
3. Shri Naresh Pal Gangwar, Additional Secretary, MoEFCC
4. Dr. Navneet Kothari, Secretary Env., Govt of MP
5. Shri Satyendra Kumar, Director, MoEFCC
6. Shri Achyut Anand Mishra, MS, MP Pollution Control Board
7. DM, SINGRAULI
8. DM, SONBHADRA
9. Shri Amit Kumar, Director, CEA
10. Shri Marapally Venkateshwarlu, Director, Ministry of Coal
11. Shri N. Subrahmanyam, Scientist E, MoEFCC
12. Shri Sourabh Kumar, Deputy Director, CEA, Mop
13. Shri R.P. Singh, Geologist, DGM UP Lucknow
14. Shri Anuj Kumar, Geologist, DGM.UP Lucknow
15. Shri Sudhir Kumar Singhai, Addl. CE, MP Power Gen. Co. Ltd.
16. Shri Ravikant Raut, Chief Chemist, M.P Power Gen. co. Lyd.
17. Shri Jitendra Prasad, Add. VP, Sasan Power ltd.
18. Shri Reetesh Tiwari, RO Sonbhadra, UPPCB
19. RO MPPCB SHAHDOL
20. S. Ansari, Director (S&T), DGMS
21. Shri Vinay Ramaiya, EE, MPPCB
22. Shri Himanshu Verma, AGM-HSE, MEIL Anpara Energy Ltd.
23. Shri Kamaljeet Rai, DGM, MEIL Anpara Power Ltd.
24. Shri Ashok Kumar Singh, G.M., Grasim Chemical division-Renukoot

25. Shri A.K. Tripathy, Dir (Tech), UPRVUNL
26. Shri Vipin Kumar Gautam, SE, UPRVUNL
27. Shri Subodh Choudhary, PCME/ECR, East Central Railway
28. Shri Md. Tausif Ullam, DTM/Chopan Dhanbad, East Central Railway
29. Shri Rohit Singh, Demhm/Dhw, East Control Railway
30. Shri R. N. Shukla, Head Env. ESG. Forest, Adani Power Ltd.
31. Ms. Khushi Parekh, Asst. Manager, Mahan Energen Ltd.
32. Shri Ashwani Tyagi, DGM, NTPC Ltd.
33. Shri K. Karthikeyar, AGM, NTPC Ltd
34. Shri M.K.V. Rama Rao, Chief Technical Officer, JPVZ
35. Shri Sanjay Singh, Joint President, JPVL, NIGRIE/Delhi Office
36. Shri Mahendra Prasad, OSD, Noida
37. Shri Nandan Kr. Choudhury, Dy. Manager (Geo), Northern Cornfield Ltd.
Singrauli
38. Shri Dinkar Tiwari, Dy. Manager (Mining), NCL
39. Shri S.L. Gupta, CE, PWD Meerut
40. Shri Hitlar, AE, CD-2 PWD Ghaziabad
41. Shri Sanjay Gupta, Dy. CCM(FM), W.C.RLY
42. Shri Sanjeev Kumar, GM (Env. & Forest), NCL
43. Shri Abhishek Singh, EE, NLCIL (MoC)
44. Shri Ranvir Prasad, MD, UPRVUNL
45. Shri Sunil Prasad Singh, D.T., NCL
46. Shri Ajay Prakash, CCM-FM WCRLY, W.C. Railway
47. Shri Sanjeev Kumar Wohra, Regional Officer, MPPCB
48. Shri Ajay Jha, Dir/ENHM/plyBQ, Railway Board
49. Team of STPP
